

Thinking Inside the Box

Security experts are getting serious about cargo containers as a key protection against terrorists
[FINAL Edition]

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It is one of the most simple and brilliant pieces of transportation engineering in history. It's a box, and it is the reason that port security is at once such a vexing and potentially such a solvable problem.

In the wrong hands, with the wrong cargo aboard, that box - better known as a shipping container - could become an astonishingly accurate weapons delivery system.

The reason is this: These containers are loaded in far-flung places all around the world and, if things go according to the script, not opened until their final destination, perhaps a location in the midst of a large American city.

That final destination would be known when the container was loaded and at every step along its journey. So if a weapon were placed aboard at some point, the container could conceivably deliver its deadly cargo with stunning precision.

This is why most of the minds thinking about port security are not concerned with the now-defunct proposal for U.S. port operators from Dubai, or longshoremen with criminal records, or even holes in the fences around ports. They are thinking inside the box.

And many of them are at the University of Maryland, College Park, one of the nation's centers of cutting-edge work on port security.

"What are we afraid of? What are the justifiable fears?" asks Bill Lahneman, associate director for programs at the Maryland's Center for International and Security Studies.

"The Dubai company [would have run] port operations. Customs searches containers, not port ops, and the Coast Guard more or less protects the approaches to the port," says Lahneman, who coordinates a program designed to make the U.S. intelligence community aware of academic research or security threats, and another project on science, technology and public policy. "Port operations has regulations and security forces aimed at anti-theft ty things, protecting warehouses.

"But is that what we are really worried about, theft? Or terrorists in some small boat charging the port and shooting weapons at it?" he asks. "I don't think that's the central feature. What we are really worried about is things coming in those containers which may be weapons of mass destruction and may be detonated somewhere in the country."

"Intermodal" is a crucial term here, referring to the fact that the containers that fill cargo ships are carried by a variety of haulers. Containers are often loaded at a factory somewhere in the world, pulled by trucks to a port, loaded into cargo holds, then shipped to another port where they are unloaded and put on freight cars for a rail shipment, then put back onto trucks for a ride to their destination.

The strength and weakness of this system - from a security standpoint - is that nowhere along the way are these containers unloaded. No one sees what's inside. A generation ago, a longshoreman might notice if there was a bomb in the cargo hold. Now, all he sees is another shipping container.

This is what makes them such ideal guided weapons delivery systems. But it also means that if you can ensure that they are initially loaded with proper goods, and that the container is not tampered with along the way, you have a pretty secure system. University of Maryland researchers say they are close to finding a means to detect container tampering.

Such a system requires international cooperation. Having the United States try to construct some security wall to seek to keep out dangerous cargo is not the way to go, the Maryland experts agree.

Jack Gansler, vice president for research at the University of Maryland, says that the first step is having what he calls a "trusted agent" at the port where the containers are loaded, to ensure that what is supposed to go into the containers is put in them.

"Say you have a container coming from the port of Singapore," says Gansler, one of the top officials in the Department of Defense from 1997 to 2001. "If you had a trusted agent there sign that it has been inspected, and what is supposed to be in it is in it, and from that point on you have a guarantee that it has not been tampered with all the way through, never opened, then I think you are pretty safe.

"You need this combination of a trusted agent when the container is sealed, an anti-tampering device, and knowledge of what's inside - those three pieces," Gansler says.

Other countries are eager to participate in such a system because, as University of Maryland engineering professor Hani Mahmassani says, "These containers are the lifeblood of the global economy."

Says Gansler: "International cooperation is a key piece of this, and I generally believe that everyone does care about it. People in Dubai want world transportation to continue. People in China do. Every nation, every state, every industry wants international trade to continue. A few terrorists might want to disrupt it, and that's what all the nations are worried about."

Mahmassani, who leads Maryland's Center for Intermodal Freight Transportation Mobility and Security, agrees.

"The Dubai guys are among the best participants in this," he says. "They are definitely known as pro-safety and security. Increasingly, all major sources containers in this country are being credentialed ... requiring much tougher checking before that container ever gets loaded on a ship. That right there is major improvement in the process."

Lahneman says that rejecting the Dubai deal was a mistake. "Dubai Ports World is a solid company," he says. "They are helping us in a lot of areas. Rejecting them was sending a signal that we just don't trust Arabs. If we could have avoided that, we should have. A lot of Arabs do a lot of things for us this area, so it has been sort of a black eye."

Many who try to make political hay out of the port security issue, once they have stopped talking about the possibility of Dubai- run port operations, turn their attention to the tiny percentage of containers - maybe 1 percent, maybe 5 percent - coming into this country that are inspected. But to the Maryland experts, focusing on that is the wrong way to go in ensuring port security.

"The idea of customs inspecting every container might be the most desirable, but it is really not attainable at a reasonable cost at a reasonable effort," says Lahneman. "Every time we do it, we slow down trade."

The poster child for this problem, he says, was an inspection regimen instituted on the bridge from Canada into Detroit after Sept. 11. Lahneman says that auto companies had a lot of parts coming in from Canada on a rigid schedule. When inspections delayed them, even by a few hours, assembly lines were brought to a halt.

Some who talk of port security hold out hope for mechanized inspections of cargo, but few think this could be accomplished effectively or efficiently. Maryland experts note how much the X- raying of carry-on luggage slows boarding at airports, while still missing many prohibited items. And containers are so much bigger, it would be much easier to hide contraband from any sort of X-ray-type inspection.

"Screening technology fundamentally has a flaw," says Kenneth Gabriel, director of the University of Maryland's Center for Integrated Security and Logistics. "In order for you to screen a container successfully from the outside, the threat has to have a huge signature. Otherwise you would not be able to detect it. And people who do things like this would have some measures to hide the signature. Screening from the outside misses far more than it catches."

Gabriel says there would be an inevitable trade-off between screenings that do not catch everything and those that come up with too many false alarms.

"Either something passes through a screen that tells you don't have a problem when you do have a problem, or you increase the sensitivity of the device and end up with more false positives," he says. "Both of those bring port operations to its knees."

Better than trying to slow and check the flow of goods as they enter the country is to focus efforts on keeping the cargo arteries flowing freely and clear of contraband in the first place, say the Maryland experts.

For now, the missing link in the system is a device to ensure that the containers are not tampered with along the way. This goes far beyond some sort of super-lock on the door. Mahmassani notes that security experts learn a lot from smugglers who have shown how to dismantle containers, fill them up with contraband and reassemble them, all without touching the door.

"A container can be tampered with in transit," says Gabriel, who also runs Maryland's Center for Automatic Identification Research. "The degree of tampering ... has been almost impossible to detect. You are talking about an ocean full of containers, and you don't even want .001 percent to be tampered with."

Gabriel and his team are working on a device that would not only ensure that the door of a container remains locked, but could detect any sort of tampering with the container - from holes drilled in its vulnerable wooden floor to the presence of a chemical or some other noxious agent.

The devices would also keep track of exactly where the container was - not only on the seas but also within a particular ship - so if any abnormality were detected, the container could be located and examined, perhaps offshore, without bringing port operations to a halt.

Gabriel says that such devices - somewhat like the EZPass tags that cars use to go through toll booths - can be programmed to transmit their information to satellites, then perhaps onto cell phone towers at regular intervals.

"A phone would ring, and the responsible person at the port would know that a shipment was coming in in the next couple of days and he would need to look at this," Gabriel says.

"We are in a pretty advanced stage with this device," he says. "In terms of actually demonstrating it, we can do that in a few months. Production is probably two to three years away."

What has many people excited about the practicality of such devices is that unlike most security measures, which impede commerce, these could actually help it. That's because as the devices tell security forces what they need to know about cargo, they also provide information that businesspeople want to

know - exactly where their merchandise is and what condition it is in.

"What we are looking at is how we can use technology basically to help us in the process of ensuring security while also at the same time helping us in doing the business of getting goods from point A to point B," says Mahmassani. "The beauty of it is that the same technology used to track containers and make sure they are not being tampered with can also be used to help everything flow better."

But, Mahmassani warns, there is no system that will guarantee security of the ports or anything else.

"There always needs to be some level of vigilance, but if you take the view that security has got to be 100 percent certain, then nothing will flow anymore," he says. "100 percent certainty is not an option. Society would not be willing to spend what it takes to achieve that, and even if it were, some entity that was really, really determined would find some loophole somewhere."

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BOX FACTS

More than 13 million sealed containers carry millions of tons of goods around the world each year.

Ships longer than three football fields can carry more than 4,000 containers stacked high above their decks on a single voyage.

One well-packed 40-foot container can hold 20,000 dolls or 6,600 dresses (on hangers).

America's top international container trading partners are China, Japan and Hong Kong.

The nation's top container ports are Los Angeles, Long Beach and New York. Most containers begin and finish their trips by truck or train.

[Illustration]

Photo(s); Caption: 1. Container 2. The Tokyo, a ship capable of holding 5,600 cargo containers, arrives at the Seagirt Marine Terminal in February.; Credit: 1. CORBIS 2. DOUG KAPUSTIN : SUN PHOTOGRAPHER

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Abstract (Document Summary)

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