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TESTIMONY BEFORE
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I would like to thank the members of this Committee for their invitation today. I will be pleased to submit more detailed testimony after the hearing in order to amplify some of my remarks. In advance of that I have submitted some written material in addition to a power point presentation given several weeks ago to the Container Cooperative Group at the US Department of Transportation, and which I have shared with members of the US Coast Guard, Customs, and other public and private officials. The presentation details a concept which I have called "Pushing the Borders Back" and which I would like to describe briefly to you today, as well as some of the consequences of it.

I have been asked to talk to several issues relating to port security, the working of the international freight system and the role of the ports in it, and to add some thoughts on how the private sector and the federal government might beneficially interact to maintain the security of the system.

Let me start with my central premise, which is that the action isn't at the port. If a terrorist device gets to a port in the United States, it's almost too late. Ports have little interaction with cargoes other than to lift them off or on the ship, to store them, or to serve as a border funnel for customs activities. Their job is in some respects no different than that of a rail yard or similar intermodal exchange node. They are either efficient pass-throughs, propelling cargoes on their way to their final destination – or, they may become bottlenecks, driving some 20 percent of the national economy into the ground.

In my mind, interdiction of terrorist activities really begins at the beginning – with the shipper and his customer, at both the physical and transactional start of an order. I suggest to this committee that it consider the notion of pushing the physical border back Electronically – to create a virtual border, if you will, that resides overseas not just in, but prior to the thousands of ports of embarkation, all the way back to the factory loading dock.

First, for all of the reasons described in testimony earlier today, and despite the low probabilities associated with any given ocean, air, or land-delivered international container, I believe that we should treat every container destined to enter or pass through

the United States as a potential weapon of mass destruction; every ship that carries it as a delivery device; and every port and point inland as a potential target.

The logical consequence of that thought is, second, that no container should be loaded on a ship or train or plane destined for the United States without having been profiled, screened, and if necessary physically inspected. We can't allow a suspect container to reach a port for inspection there, because the port is a potential target. We can't allow it on the ship because ships – some of which today carry the equivalent of 6500 or more containers can only be turned back to the point of embarkation – not stopped, searched, and accessed for removal of a container while on the high seas. These boxes are from 20-48 feet in length, 8 wide and high, and can weigh 20 tons or more and be stacked 9 deep in the hold of a container ship. It's simply too late to inspect a container on arrival in a US port.

If it's too late to inspect them on arrival here, then can we inspect all of them somewhere else, for example in overseas ports? If we did, could we control it? And is physical inspection any better than other methods? Before I get to that and some alternatives, let me talk to several other issues.

This first slide illustrates a key point: International trade is a tremendously complex business. A typical trade, in fact, may have as many as 20-25 involved parties – buyers, sellers, inland transporters on both sides of the ocean, ocean and other water carriers, middlemen, financiers, governments and others – and will generate 30-40 documents and some 200 different data elements. Each container is valued, on average at $60,000 or more, and most carry cargoes for multiple owners. Some 6 million entered the US in the year 2000, 17,000 a day. There are literally millions of people and hundreds of thousands of companies worldwide engaged in the business of moving cargoes internationally: In the US alone, there are an estimated 400,000 importing and exporting companies, 5,000 licensed forwarders and customs brokers, perhaps as many as 40,000 consolidators large and small, and millions engaged in the transportation industry. Worldwide, there are at least in theory some 500 ocean carriers – although probably 10-15 carry 90 percent of cargoes shipped between continents – an estimated 50-70,000 forwarders and tens of thousands more intermediaries, not to mention several million companies moving goods.

The port seems important, and is, because 95 percent of all international trade arrives in the US by ship – some 20 percent of the US economy The typical ship entering our waters will carry from 4000-6000 TEU's (the equivalent of a 20x8x8 foot container), twice the size the industry thought was viable just ten years ago. An 8000 ship is already on the drawing board, and some experts expect ships of nearly twice that size in the not too distant future. A large vessel may generate over 40,000 documents on docking in a

port, and the value of the cargo one of these ships may carry may reach half a billion dollars. The overall value of the trade with the United States is in the neighborhood of $700 plus billion just in cargo value. .

If we were to add a physical inspection to one of the very large ships carrying cargoes to the US through the world's hub ports – the Regina Maersk, for example – a single hour's delay per 20-foot container would add over 250 man-days to the time it took to offload the ship. Today, a ship is loaded and unloaded in a day or a day and a half, depending on the port. Estimates vary as to the number of ships which dock here each day from 300-500, but we do know that 17,000 containers arrived here last year, and that the volume of this trade is expected to double – double – before the year 2010. Assuming the same labor requirement, that's nearly 3 additional man-years per day, some 1000 over the course of a year.

But the ship isn't the whole story and that really is my third point. A lot of the discussion here is about protecting the port, which is natural given the legislation before the committee. But the port, frankly, is the least of the problems. Yes, it's important to protect the security of the physical infrastructure, yes we have to worry about the safety of specialized vessels and guard against attacks like those which took place on the USS Cole. But in terms of the system of intermodal trade – shipping, moving goods around the world in international trade – the port is just one – not even the most important – piece of the puzzle. It should be considered the point of last – not first – resort in our war on terrorism.

Just as a note, I will be talking a lot about shippers, carriers, and others today. For those of you who aren't logisticians, the shipper is the owner or producer of the cargo in motion. Transportation providers – ships, trains, planes, and trucks – are carriers. Middlemen include forwarders which have historically prepared the documentation, handled the money and arranged for the transport of cargoes overseas, and which today more often than not handle both sides of the transaction; customs brokers, who handle the inbound documentation, storage, and other activities, and consolidators and other middlemen who broker cargo capacity, sometimes act as carriers, and who are now often integrated into the manufacturing process very much as assemblers of finished goods.

As I said in the first slide, international trade is a complicated business. Every trade has a seller and a buyer. Every trade requires a manufacturing event, more often today multiple events and assembly. Every trade requires a land movement or multiple movements – from multiple manufacturing points to an assembly point by truck, from a factory to a rail head to a port. Every intercontinental trade requires a ship or a plane and those from Canada and Mexico will likely use a truck. Once landed in a US port, a truck

or a train or a combination of both will move the goods to a destination or multiple destinations. And in between there will be Customs duties, checks, assembly and subassembly movements again before an international shipment finally comes to rest. Typically, some form of middlemen – freight forwarders, customs brokers, consolidators and others – will be involved in expediting the flow, handling the paperwork, or reducing the cost of the move by brokering space or transportation to the benefit of the – usually small – shipper. For the record, some 80 percent or more of US businesses outsource some of all of this process to third parties.

Over 50 percent of what moves is shipped by consolidators, although the largest percentage – perhaps 80-85 percent -- of what they move, according to my sources in the industry, is full container loads rather than actually consolidated from smaller orders.

While this hearing is about ports, the issue is really about the entire transportation and manufacturing process. The USCG Commandant, Admiral Loy, has taken the lead in describing a new way if thinking about the problem that he has called "Maritime Domain Awareness." I would take that one step further – as I show in the slide – to suggest really five transportation systems domains around which we can build a response. The first – the one I view as most important from the standpoint of ultimate security -- is that from manufacturer to port and includes the manufacturing facilities themselves, consolidators, packers, inland transport, and a variety of middlemen. It goes back to where, when, and by whom a container was packed, in addition to the question of with what. I suggest to you that it is in and from this step that the data can be – in fact already is – generated that can provide the principal input to the electronic border. This is a domain dominated largely by the foreign shipper, the foreign middleman, the foreign transporter and foreign port, and by foreign governments. **While we certainly, as the worlds largest trading nation, have leverage with foreign governments here, I believe our greatest leverage lies in the trading relationship itself – between the buyer and seller, both private sector parties**.

The second, as the chart shows, is at the port of embarkation – where we have no jurisdictional reach or authority – but where the physical integrity of the cargo, the ship, and the port facilities themselves continue to be important. It is also at this point, not in an American port, that I would argue the principal interdiction effort should occur. Cargoes that are identified as suspicious should be detained here – prior to loading on a ship for transport into or through the United States – rather than in the US port itself.

The third is the voyage of the ship. Ship ownership, crew integrity, physical integrity of the ship itself require an entirely different response – some physical, and some data based profiling of involved parties, not the least of which are the crew themselves and the party

they work for.

The fourth domain is at and around the US port – the domain Admiral Loy has so well articulated, and in which the USCG and US Customs are historically most particularly involved.

And, finally, there is the inland movement in the United States. From the standpoint of security, the issue is to whom is a cargo ultimately going, by which route, and by which transportation means: Who will touch it, who will receive it, how will they use it.

Throughout this process, the shippers of the goods are for the most part physically out of control of the trade. They've hired freight forwarders or consolidators or third party logistics companies to handle the business because their expertise is in the manufacturing, marketing, and sale of the product. All they really care about at the gross level is that they get exactly what they ordered – no more and no less – and that it gets there at the time and price promised. Some have created intelligent order systems, spent millions on enterprise resource planning and automated customer service systems, and others have acquired or constructed internally services like those offered by my own company which allow them to track, measure, and steer the progress of their goods either physically or in terms of process and paperwork, the latter actually being more important in the manufacturing process than where something actually is. As long as they know it's on course, are apprised of delays, have the ability to re-plan a move or a manufacturing process in the event of a supply chain problem – than they are satisfied. That's really all they need.

The focus of logisticians and companies – particularly American companies – over the last several decades has been on making that flow faster, cheaper, more transparent, and faster yet. Our success at that provides an enormous competitive advantage to many of our companies and makes a huge contribution to the reduction in the cost numerous articles and products crucial to everyday life in the United States.

So, I have been over the last several weeks both surprised and not surprised to hear various public officials proclaim that security rather than speed would provide the competitive edge for ports in the US in the future.

With all due respect, speed and cost were the two most important criteria for the selection of ports and transportation before September 11 – and they will, for all but a handful of shippers – continue to be the most important criteria in the future. There are some 361 ports in the US, a dozen or so major ones, and hundreds of land border points including airports. Ports that are secure but slow will surely be avoided.

So we can't delay the supply chain and I think it unlikely – if only because it is prohibitively expensive – that we can physically inspect every container and the numerous boxes and orders within it, whether in a US port, on board ship, or at the port of origin.

What does that mean in economic terms? Well, first, we're talking not just labor cost but inventory cost. Logistics costs have steadily declined from 25 percent to lower than 15 percent of GDP over the last 20 years. Inventory is the response companies make if they are uncertain about transportation or suppliers. Carrying costs associated with inventory at rest – goods in storage – in 2000 was nearly $400 billion, about a fourth for interest expense, another fourth for actual warehousing expenses, and the rest for taxes, obsolescence, insurance, etc. Good suppliers and transportation make this expense decline, and it's a number that many economists watch to ascertain the overall efficiency of the system. Bob Delaney, one of the more notable logistics gurus, has estimated that just a five percent addition to inventory – the response industry will have to take in order to make up for slow processing times – would cost the economy an additional $75 billion annually, the equivalent, by the way, of some 75,000 jobs lost, not counting the multiplier effect of these wholly non-productive costs.

Introducing uncertainty, slowing down cargoes through physical inspection of every container and every box inside it, otherwise derailing the transportation system, is exactly the opposite of what we should do if our goal is to maintain a healthy American economy.

So, while physical inspection at the port of entry is not only unrealistic but in principal too little, too late, there is an approach which is more holistic and which takes advantage of the dynamics of the modern international trade process. **I believe the solution lies in closely aligning the interests of the government in security with those of the private sector in speed and cost to create a new, more rapid and efficient international transportation system that works not only to our own benefit, but to that of our trading partners.**

It is my belief that we can – and should – literally push the border back, back to the point of origin of every cargo that enters or passes through the United States, through the use and creation of electronic data profiling on every cargo and every container in which it is carried. This virtual electronic border is already in place, in a sense, scattered across millions of documents, reported at varying places in the process – some reported to governments, some maintained in the privacy of the buyer-seller transaction.

In simple terms, I suggest that we create a cargo profiling system that activates prior to

the loading of a cargo on a ship, which uses existing commercial data, existing governmental data, and which extends capabilities we already have in the arena of drug interdiction to cover this new problem. (I say virtual here because I'm not sure that it has to be a new data base so much as a means of handling data). The components of the system are already partially in place. **There are several currently reported documents and several privately held documents on the commercial side that could be combined with a government run intelligence and national security data to be combed through this kind of process; and which could form the basis for the pre-release I suggest prior to loading on a US-bound vessel.**

Four existing commercial documents already reported in one form or another to the government would provide much – but not all – of the data that would allow us to profile a cargo based on contents, involved parties, and transport mode and path: (1) The Shippers Letter of Instruction; (2) Commercial Invoice; (3) Certificate of Origin; and (4) The carrier's Bill of Lading. To that I would add (5) financial data, perhaps captured through Letters of Credit or bank reporting; (6) Inland transportation leg information not now captured by ocean carriers or the government, on both sides of the supply chain; and perhaps additional information. One key flaw, as you can see in the third chart, is that most of this data is reported on the high seas or sometimes even after arrival at Customs. Some of it is never reported to the government, and probably never should unless properly "firewalled" from commercial competitors.

The principal regulatory action here would be to require the reporting of this data prior to the loading of a container onto a ship, for a pre-release or even a pre-clearance by a government agency, probably US Customs.

As happens today on the drug enforcement side, government intelligence and law enforcement data could be combined with an intelligent profiling process or algorithm – that would allow the government to "data mine" the combined data base to profile a cargo based on what it was, who generated it, where and how it moved and where it was going, its intended use.

Validation of the data, normalization of the various data transmissions – the parties to a transaction generate data by a wide variety of technologies, some sophisticated (EDI or web-based), some not (faxes, email) – through a trusted parties process not unlike some Customs and the private sector use today would be a crucial part of the process.

As an aside – and I am not an expert in this part of the process, but do deal with it, "data mining" is the technical term for methods that extract useful knowledge from large sets of

data. These methods are already used to assess the risks associated with specific containers, vessels, ports, countries, individuals, or other features of interest. No single method of data mining is sufficient to provide maximum performance in either the short-term or long-term future. We would need to consider a multi-pronged, synergistic approach that combines four important aspects of gleaning insight from the available data.

First, our own knowledge of operations and anomalies can be captured in rules and facts, known as a "knowledge base," which may pertain to both specific and general information, relationships between data, expectations and other expertise. Items that violate expectations or otherwise contradict human expertise are considered to be more suspicious. Specific knowledge may even identify individual containers that may pose a threat. Some of the anomalies you look for beyond the obvious one of a suspect source area might include a cargo incongruent with its origin; a high value cargo moving on a slow mode; document discrepancies; new shippers or consignees; violations of established shipping or commercial patterns; peculiar transshipments or transportation moves that don't make sense, and so on. The documentation included with this testimony points to some specific documents that might help you detect these particular discrepancies.

Second, in addition to relying on available knowledge, statistical patterns can be identified in risky and threatening shipments, and these patterns can be useful in modifying risk assessments. This is similar to the manner in which an individual's age is often used to modify a physician's assessment of patient risk from various forms of cancer.

Third, mathematical models are required to combine knowledge and statistical patterns into meaningful (numerical) assessments of the risk. The models must be responsive to general and specific inquires and must therefore be flexible and sophisticated. It is unlikely that traditional mathematical modeling will be sufficient in this regard. Instead, methods based on models of human neural systems (such as "artificial neural networks" in which software is written to mimic the functioning of brains) may be particularly suitable.

Finally, the risk assessment programs or regimen must be updated continually in light of new data to detect changes in patterns and discover novelties. Any fixed assessment system will be defeated. Here, a new branch of artificial intelligence, called evolutionary programming, offers the solution as it enables the risk assessment system to actually invent new rules for detecting threats in much the same way that our own immune systems seeks out new germs.

Cargo profiling is only part of the solution. Programs like the trusted shippers program used to screen cargoes carried in the hold of commercial airliners can be expanded to a larger trusted parties effort. Customs has had some success with public-private partnerships called BASC in interdicting drug trafficking, although even here they will tell you that the success rate is probably at no more than 20 percent.

The newly appointed Customs Commissioner, Robert Bonner, is thinking on somewhat the same lines, and last week announced an effort which is right, but again only a part of the solution: "We must reaffirm the importance of knowing your customer and consider the overall airtightness of your supply chain, from factory floor to loading dock to transportation to our border. Every single link in that chain must be made more secure against the terrorist threat." His specific suggestions included increasing security at the plant or loading dock, enhancing security during transport, whether by land or by sea, making advance manifest information on cargo more accurate and timely, and using electronic seals for container shipments. The companies that do this, he said, "…will be given a 'fast lane' through border crossings and through seaports and others ports of entry."

One flaw – a significant one – is that cargo manifests can only tell you what the ocean carrier knows. If inland transportation was arranged by a third party or the shipper, if the cargo was consolidated elsewhere, the manifest won't show it. Nor is the carrier likely to be voluntarily given all of that information as some of it may be considered proprietary. Data on a container that simply passes through a US port on its way to another country might as well be invisible.

The purpose of this "intelligent electronic border" is to identify cargoes that look suspicious. It's a system that I think Customs has the authority to enforce, given Congressional support, and it is a process that could perhaps be embedded into and as an extension of the Automated Customs Enforcement (ACE) system they are currently building – but which is scheduled to take another five years to deliver. The US Coast Guard also has an extensive law enforcement and national security data base effort going on, and numerous government data bases could be tapped through the new process for relevant data without violating the need to maintain the competitive position of individual companies and due process for the parties involved.

In the hierarchy of responses, this would all be first, intended to intelligently narrow the search. At varying stages across the process we have to layer on passive and physical inspection, physical protection of the ports, protection of the cargo integrity from the basic risks of international transport – spoilage, tampering, theft – the ability to interdict

specific cargoes, tracking and visibility solutions that allow us to maintain not only the integrity of the cargo but of the transport system itself. I would be happy to talk to some of these as well.

The critical issue, however, will be to obtain voluntary – not mandatory – commercial compliance with all of the parties in the commercial transaction. Most of the processes covered here are outside the domain of US law enforcement. We can't make foreign suppliers abide by all of these rules, but we can certainly tell their US customers that they may face delays unless they know their sources and can validate cargo and process integrity. We can't tell a foreign port that it has to purchase millions of dollars worth of screening devices for the cargoes destined for the US which our screening picks out as suspect, but we can certainly negotiate procedural agreements through the IMO and individual American ports and distribution arms can provide speed incentives for those that work with us. The ocean carriers barely make 1-2 percent ROI, so they will only be driven into bankruptcy if we require that they purchase screening machines and add hundreds of new security personnel, but we may be able to help them through the imposition of a user charge on all cargoes going through US ports, a portion of which is used to offset their additional costs. We can't mandate that the carriers for which the US is only one of several stops profile all of their cargoes before sailing; but we can no doubt find a way to say that if we determine that a cargo is found to be suspect the entire ship will be turned back because we won't risk the US port.

And finally, we really can't tell the US ports that they're the first line of defense. This Committee and this government have a real obligation to see that no weaponized container ever makes it to the port, period. They have an obligation to protect the integrity of cargoes once entered, and they have an obligation to their customers – the failure of which to provide will destroy their commercial viability and that of the general economy – to provide a speedy, low-cost transportation move.

Again, I appreciate the Committee's time, and would be glad to discuss any of this further.