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Securing America's Ports

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RAND Office of External Affairs

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The RAND Corporation

Securing America's Ports²

**Before the Committee on Homeland Security and Governmental Affairs
United States Senate**

June 4, 2014

Chairman Carper, Ranking Member Coburn, and members of the Committee, thank you for inviting me to submit testimony for this hearing.

As this committee considers the issue of port security, I will point out three ways we can make America's ports more secure:

- Improve the evaluation of port security programs.
- Increase the reliance on local risk assessments when awarding port security grants.
- Reconsider the 100% container inspection mandate.

The importance of securing America's ports

America's ports play a vital role in the nation's economy. Each year approximately \$500 billion in containerized imports and \$200 billion in containerized exports transit our ports as more than 12 million containers are loaded onto ships.³ In addition, U.S. ports enable the efficient shipment of non-containerized exports such as oil and grain.

This productivity is the result of complex cooperation among many sectors. Transportation firms physically bring freight to and from ports via water, road and rail. Local law enforcement, the U.S. Coast Guard, and U.S. Customs ensure trade occurs safely and in accordance with U.S. laws. Banks, brokers, and freight consolidators make sure that shippers needing goods can contract with manufacturers or suppliers who have them and carriers who can transit them. These interactions make the freight supply chain of the U.S. one of the most efficient and rapid in the world.⁴

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² This testimony is available for free download at <http://www.rand.org/pubs/testimonies/CT410.html>.

³ Bureau of Transportation Statistics (2011). *America's Container Ports: Linking Markets at Home and Abroad*. US Department of Transportation, Washington, DC.

⁴ Willis, H. H., D. S. Ortiz (2004). *Evaluating the Security of the Global Containerized Supply Chain*. TR-214-RC, RAND Corporation, Santa Monica, CA.

The scale and the complexity of ports draw attention to their vulnerability to terrorism and natural disasters. If targeted by an attack or affected by a disaster, resulting disruptions at ports could lead to cascading economic damages totaling billions of dollars.⁵ The difficulty of thoroughly inspecting containers leads criminals to use them as a common means of smuggling. Thus, policymakers and security analysts point out that terrorists might also try to use this mode of transit to bring nuclear weapons or other materials into the country.⁶

The response to perceived vulnerabilities of U.S. ports has been the accretion of a layered system of defenses to secure America's ports. The Maritime Transportation Security Act implemented requirements to make vessels and port facilities more secure. The Transportation Worker Identification Credential (known as TWIC) was developed to reduce insider threats associated with freight transportation operations. U.S. Customs introduced advanced manifest notification rules to enable capabilities to screen incoming freight in advance of it being loaded on ships bound for the U.S. Secure trade lanes, such as the Customs-Trade Partnership Against Terrorism, were implemented to reduce the impact of new security measures on the efficiency of trade. Requirements were legislated for the use of radiological detection and non-invasive imaging to scan containers and equipment. These technologies have now been installed at ports around the world to counter nuclear smuggling threats.⁷

As these security programs have matured over the last decade, two programs warrant special attention at this hearing: the Port Security Grant Program and the SAFE Ports Act requirement for 100% scanning of all containers imported into the U.S. before they are loaded aboard a ship. Funding for improving port security has declined from \$389 million in 2008 to \$100 million in 2014.⁸ U.S. Customs and Border Protection continues to implement risk-based container screening and scanning but is still held accountable for the 100% scanning requirement. These fiscal and operational realities make it an opportune time to ask three questions about the state of port security:

- What has more than a decade of investments in improving port security accomplished?
- Are the current priorities for port security grant programs correct?
- Should the 100% scanning requirement be implemented?

What have investments in improving port security accomplished?

Unfortunately, the answer is we don't really know.

⁵ Adam Rose and Dan Wei (2013). Estimating the economic consequences of a port shutdown: The special role of Resilience. *Economic Systems Research*, Vol. 25, No. 2, 212–232.

⁶ GAO (2006). *Combating Nuclear Smuggling*. GAO-06-389, Washington, DC.

⁷ Willis, H. H., D. S. Ortiz (2004). *Evaluating the Security of the Global Containerized Supply Chain*. TR-214-RC, RAND Corporation, Santa Monica, CA.

⁸ These figures are in nominal dollars, thus the decline in funding would be even greater in constant year dollars.

The latest approaches to measuring security and preparedness apply performance logic models to explain how funding and resources make a difference.⁹ Such approaches help us distinguish:

- Inputs – funding, people, facilities and equipment that are available to improve security.
- Capacities – how inputs are organized to support functions that improve security.
- Capabilities – what tasks can be performed to improve security.
- Outcomes – What is ultimately achieved as a goal.

Most attempts to describe how grant programs have improved security describe what inputs and capacities have been developed. For example, communities have developed security and emergency management plans. They have purchased and stockpiled materials to be used during a disaster and installed security equipment, such as guards, gates and cameras, to make ports less vulnerable. They have upgraded communications equipment and established mutual support agreements with neighboring jurisdictions to improve coordination during a response. They have even trained employees and volunteers on how to respond when an event happens. Radiological detection equipment has been installed in ports around the world. By measures like these, funding for port security, or for that matter broader counter-terrorism and preparedness, has clearly made a difference.

However, these measures describe inputs and capacities. Having capacity is not the same as having the capability to respond. The difference between capacity and capability is the difference between having a bicycle and being able to ride it. Thus, while it is easy to identify how grant funding was spent, it is challenging to determine what difference the change makes.

Ultimately, program evaluation should address outcomes. For preparedness grants the ultimate outcome, reduction in risk, is difficult to measure. Thus, a reasonable interim step is to ask what capabilities have been enabled by the grant programs.

For the Port Security Grant Programs, the National Preparedness report begins to answer this question. Through this report, FEMA asks local jurisdictions to self-assess their preparedness across 31 core capabilities related to prevention, protection, mitigation, response, and recovery.¹⁰ Focusing assessment of preparedness and security is a positive step in managing the grant programs. Yet performance measurement is still maturing. If we are to better answer the question of what port security or other grant programs have accomplished, evaluation must be improved in two ways.

⁹ Victoria A. Greenfield, Valerie L. Williams, Elisa Eiseman (2006). *Using Logic Models for Strategic Planning and Evaluation*, TR-370-NCIPC, RAND Corporation, Santa Monica, CA.

¹⁰ FEMA (2013). *National Preparedness Report*. Federal Emergency Management Agency, Washington, DC, March 30, 2013.

- First, subjective, self-reported evaluations can be supported by more reliable assessments – for example, using a system of audits and reviews or incorporation of functional drills and tests of component capabilities.
- Second, preparedness evaluation can assess whether communities have developed sustainable capabilities. Over time, capabilities can fade. Trained personnel retire or take new jobs. Equipment is consumed or becomes obsolete. Sustainability is not something that just happens, it must be planned for. Thus, preparedness and security assessments must describe whether security improvements can be expected to last.

For the issue of radiological detection, considerably less progress has been made in program evaluation. The Domestic Nuclear Detection Office (DNDO) is responsible for coordinating the government wide efforts to detect and interdict illicit trafficking of nuclear materials destined for the U.S. In 2011, the National Academy of Sciences concluded that DNDO was not able to make a compelling case for why advanced nuclear detection capabilities improved port security enough to justify the cost of acquiring and operating the equipment. At that time, the review panel, of which I was a member, recommended that DNDO improve the methods it uses to analyze the benefits of improved detection capabilities.¹¹

In 2013, a second review panel of the National Academy of Sciences, of which I was not a member, made the same recommendation, concluding that over the two years between the assessments, little progress had been made.¹²

I urge Congress to continue to work with and support DHS to improve both our understanding of the current state of port security and the methods by which we assess it.

Are the current priorities for port security grant programs correct?

There is general consensus that priorities for the port security grant programs should be based on risk. Unfortunately, reliable methods for measuring risk at ports – especially terrorism risk at ports – remain elusive. Yet, greater reliance on local risk assessments in the award process could make ports more secure.

As currently managed, the port security grant program uses a two-stage process to allocate and award grants.¹³ The first stage is commonly referred to as the risk assessment. At the risk assessment stage, DHS uses proxies of threat, vulnerability, and consequence to group ports into three tiers. The highest

¹¹ NAS (2011). *Evaluating the Testing, Costs, and Benefits of Advanced Spectroscopic Portals*. National Academy of Sciences, Washington, DC.

¹² NAS (2013). *Performance Metrics for the Global Nuclear Detection Architecture*. National Academy of Sciences, Washington, DC.

¹³ For a more thorough description of the grant allocation process see GAO (2011). *Port Security Grant Program: Risk Model, Grant Management, and Effectiveness Measures Could Be Strengthened*. GAO-12-47, Washington, DC.

Tier, Group 1, contains the ports judged to be at greatest risk. Groups 2 and 3 are judged to bear comparatively less risks. These groups define the amount of funding for which a port is eligible to compete.

In the second stage, the Award stage, project proposals are reviewed, ranked and selected. One input into this review is a risk assessment conducted at the port. This risk assessment considers which assets at the port may be at the greatest threat, may be most vulnerable to attack, and would lead to the most damage or destruction if attacked. The assessment also considers how the project would reduce vulnerabilities or consequences of an attack, and thus reduce risk.

Though imperfect, this process is a practical means for implementing risk-based allocation of grants. Though the first stage is referred to as a risk assessment, it is more aptly referred to as an assessment of importance of a port. For example, many of the proxies used reflect the size of the port or size of communities around the port. By using these measures, the “risk” score for the port security grant program is not changed by any of the funding applied to port security.

The second stage incorporates an assessment that is more appropriately referred to as a risk assessment. The port security risk assessments describe specific vulnerabilities and consequences at ports, which in theory change when proposed security countermeasures are implemented.

Greater reliance on local risk assessments and consultation with port security operators when awarding grant projects can improve how risk assessment is incorporated into setting priorities for port security.

Should the 100% scanning requirement be implemented?

Studies of this mandate demonstrate that there are ways it could be implemented, but raise questions about whether it should be.

DHS works with federal and international partners to detect and interdict illicit trafficking of nuclear materials or weapons. The system of cargo screening and scanning is designed around the premise that DHS can use shipping manifests along with knowledge of shippers, importers, and carriers to identify and focus inspections on shipments that pose the greatest threat of smuggling.

DHS concluded that this “risk-based” system, along with tips for smuggling investigations and some random inspections, provided the best balance of interdiction capability, deterrence, and minimal disruption of trade. As recently as 2012, the Secretary of DHS (then Janet Napolitano) decided not to implement the 100% container inspection requirement. Yet, the legislative mandate remains in effect.

In the years since the 100% requirement was enacted as law, it has been extensively studied. Analysis of port operations demonstrated that 100% scanning could be implemented at some of the world's largest ports.¹⁴ However, assessment of the costs and benefits of this requirement raise questions about whether implementing 100% inspections is desirable:

- Do the benefits of 100% inspection justify the costs? Only for preventing nuclear detonations, but not dirty bombs and only if implementing the program doesn't cause shippers and carriers to modify their supply chains, adding costs and inefficiencies to freight transportation.¹⁵
- Would 100% inspection deter nuclear terrorism? Not significantly. While 100% inspection might dissuade nuclear smuggling via container shipping, would-be terrorists have many other ways to smuggle a nuclear weapon should they acquire one.¹⁶

If DHS is called upon again to explain whether or not the 100% container inspection will be implemented, I urge Congress to also consider at that time whether the mandate itself should be reconsidered.

Again, Chairman Carper, Ranking Member Coburn, and members of the Committee, thank you for inviting me to submit testimony on this very important issue for the nation.

¹⁴ Nitin Bakshi, Stephen E. Flynn, and Noah Gans (2011). Estimating the Operational Impact of Container Inspections at International Ports. *Management Science*, Vol. 57, No. 1, pp. 1-20.

¹⁵ See van de Voort, M., H. H. Willis, D. S. Ortiz, S. E. Martonosi (2007). Applying risk assessment to secure the containerized supply chain. In I. Linkov, R. J. Wenning, G. A. Kiker, *Managing Critical Infrastructure Risk*. Dordrecht, The Netherlands: Springer and Martonosi, S. E., D. S. Ortiz, H. H. Willis (2005). Evaluating the viability of 100 percent container inspections at America's ports. In H.W. Richardson, P. Gordon and J.E. Moore II, *The Economic Impacts of Terrorist Attacks*. Cheltenham, UK: Edward Elgar Publishing.

¹⁶ Haphuriwat, N., V. Bier, H. H. Willis (2011). Deterring the Smuggling of Nuclear Weapons in Container Freight through Detection and Retaliation. *Decision Analysis* an INFORMS Journal, 8(2), 88–102.