BARRIERS TO THE SUCCESS OF 100% MARITIME CARGO CONTAINER SCANNING

Final Report – ESD.10 Introduction to Technology and Policy

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Executive Summary

The attacks of September 11, 2001 revealed national security vulnerabilities that had previously not received high level priority in the United States, such as insecure transportation and infrastructure networks. In response, airport security—including passenger and baggage scanning—has been improved. Yet seaport security policies have been slow to change. Five years after 9/11, only 5% of the six million cargo containers that arrive at U.S. seaports are scanned for threats.

The importance of port and cargo container security has prompted Congressional attention. However, legislative attempts to mandate 100% scanning of cargo containers bound for the U.S. have thus far failed, such as Representative Edward Markey’s (D-MA) proposed amendment to the SAFE Port Act.

This study identified and analyzed five major barriers to 100% cargo container scanning: ambiguity in 100% cargo scanning policies, technology limitations, cost, logistical difficulties, and stakeholder support. We presented recommendations that can overcome each of the identified barriers. Finally, we evaluated possible channels that can be used to achieve a successful 100% cargo container scanning program.

Ambiguity in 100% Cargo Scanning Policies

Policy makers have exploited the vagueness of certain 100% cargo container scanning policies in order to debate their usefulness and feasibility, preventing the adoption of any 100% cargo scanning policy to date. Before any discussion of a 100% cargo container scanning policy can take place, the associated terminology must be clearly defined.

After policy makers agree on terminology, there still exists a danger that the overall goals and objectives of the policy remain poorly defined. Cargo scanning policies may be designed for detection, deterrence, or resiliency.

Technology Limitations

Opponents of 100% cargo scanning have argued that scanning technologies are too immature to be scaled up to 100% levels. While this is true for chemical and biological detection, the Port of Hong Kong—the second largest port in the world—has successfully instituted a 100% scan of all cargo using imaging technology and radiation detection.

This study evaluated the capabilities of currently available scanning technologies. We found that a basic scan of all cargo bound for U.S. seaports could be accomplished using imaging technology and passive radiation detection.

Cost

The economic implications of 100% cargo scanning extend not only to the cost of the technology and direct implementation (including labor and maintenance), but also to the indirect costs of delay in the supply chain. Many cargo systems, specifically perishable goods and “just-in-time”
processes, are intolerable of long inspection processes and delays, making indirect costs significant.

Evaluating the benefits of 100% cargo scanning is necessarily difficult because it requires comparing the costs of the policy with the benefit of preventing a terrorist attack. Studies have estimated that port attack costs can range from $1 billion to $1 trillion. Benefits associated with preventing an attack are difficult to quantify, and thus any economic justification of 100% cargo scanning policies is challenging.

**Logistical Difficulties**

Four logistical questions must be answered to design a successful 100% cargo container scanning program. These questions are: Where in the supply chain should cargo be scanned? How should cargo containers be scanned? When should scan data be viewed? How should risk analysis be incorporated?

The primary considerations are: extending protective borders around the U.S., trustworthiness of scans and resource restrictions. To extend borders, scans can be conducted at foreign sites. To ensure trustworthiness of scans, the operations can be overseen by U.S. officials.

Resource restrictions are the limiting factor to implementing a 100% scanning program. If 100% of cargo containers are scanned and viewed, 5% will be flagged for physical inspection due to the false positive rate of current technology. This would require a 20-fold increase of land and labor requirements at ports. This can be mitigated by using risk analysis to limit the fraction of scan data viewed, thereby maintaining current physical inspection rates.

**Stakeholder Support**

Successfully implementing a 100% cargo scan policy requires the support of all parties who have a stake in the policy. This study expresses the primary stakeholders as: the U.S. Department of Homeland Security, U.S. legislators, foreign governments, retailers/manufacturers, port authorities, terminal operators/ocean carriers, longshoremen, and ground transportation firms.

Six key issues are used to express the interaction between these many stakeholders: port throughput, supply chain security, regional security, cost of program, jobs creation and worker safety. During the course of this discussion the primary tradeoffs that influence stakeholder decisions are identified, including balances of equity, efficiency, security, liberty and privacy.

**Channels and Resources**

The committee also evaluated three channels that can be used to achieve 100% cargo container scanning: business as usual, market education/incentives, and legislative mandate.

Business as usual implies allowing DHS at its discretion to increase cargo scanning programs overseen by Customs and Border Protection, which may eventually result in 100% cargo container scanning. However, there is no guarantee that current trends will continue until 100% scanning is achieved. Employing market incentives to encourage cargo container scanning may appease some of the current industry opponents but is no more reliable than business as usual. Legislating 100% cargo scanning is a more certain and direct method of achieving a successful
policy and would be most desirable in terms of stability. Still, the legislative channel is a contentious one, as evidenced by the recent defeat of the Markey amendment.

**Recommendations**
This report presents six recommendations to overcoming the barriers to success of 100% maritime cargo container scanning:

1. Study the effect of 100% scanning as a deterrent to terrorist attacks.

2. 100% scanning should be conducted at foreign ports.
   a. Scanning at foreign ports should be overseen by U.S. officials who monitor compliance with U.S. scanning standards.
   b. Promote development of anti-tamper devices.
   c. Containers that are not scanned at foreign ports should not be loaded on ships.

3. Couple radiation detection with imaging for 100% scanning. Focus R&D on reducing false positive rates and improving chemical detection technology.

4. Coordinate stakeholders with strong executive backing and propose unambiguous legislation to Congress stipulating 100% scanning.

5. View and interpret only 5% of stored scans based on 100% risk screening.

6. Emphasize resiliency as the primary goal of 100% scanning.