



Improving Maritime Transportation Security in Response to Industry Consolidation

By Nick Monacelli

Abstract

Containerized cargo is the single largest security vulnerability in maritime shipping. Recent consolidation in the maritime shipping industry, along with freefalling shipping rates and increased vessel sizes, combine to cause concern for the future of containerized shipping security. Maintaining security in the maritime shipping industry is critical. Programs including the Container Security Initiative and Customs-Trade Partnership Against Terrorism apply risk-based approaches. However, with fewer market players after industry consolidation, it is time for regulators to review the success of current programs and search for new initiatives. New partnerships and outreach may use current efforts as a framework to respond in a dynamic environment to improve the industry's overall security. This essay investigates the way ahead, while proposing solutions. Changes to C-TPAT and CSI may be necessary to maintain a secure Maritime Transportation Security (MTS).

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Introduction

Containerized cargo is an ongoing security challenge for the Maritime Transportation System. With gargantuan container vessels plying international routes, it becomes nearly impossible to ensure the safety of these trade lifelines. Recent consolidation in the maritime shipping industry, combined with free-falling shipping rates, combine to cause concern for the future of containerized shipping security. Compounding the present difficulties, container ships are growing in size and capability. Where once it was possible to inspect every container on a given ship, it is now unthinkable with vessels carrying over 20,000 containers.

Maintaining security in the maritime shipping industry is critical to preparing and responding to the parallel growing security threat. Programs including the Container Security Initiative and Customs-Trade Partnership Against Terrorism apply risk-based approaches. However, with fewer market players after industry consolidation, it is time for regulators to review the success of current programs and search for new initiatives. New partnerships and outreach may use current efforts as a framework to respond in a dynamic environment to improve the industry's overall security.

This essay presents a path forward for U.S. security professionals by providing specific recommendations for the Department of Homeland Security. By leveraging existing programs, policy-makers can make some minor changes which may pay large dividends. Regulators should take the industry's mergers as an opportunity to engage in an effort to shape security measures in a changing environment. An understanding of the current situation requires a review of the evolution of containerized shipping and the industry's development. A discussion of current regulatory approaches follows, with examples and the effects of recent industry re-alignment. Finally, the essay provides tools that U.S. regulators may adopt to make the industry safer and more secure.

The Evolution of Containerized Shipping

The New Era of Containers for Intermodal Shipping

Fewer technological advances contributed more to globalization than the advent of containerized shipping. In the span of 60 years, shipping containers evolved from novelty to ubiquity. Originally designed to assist intermodal transportation by Malcom McLean in 1955,¹ containerized shipping became a lightning rod for commerce. The first container ship, *Ideal X*, sailed in 1956 with 58 containers from New Jersey to Houston. Because of the decreased shipping costs, mainly due to efficiencies with loading/unloading and locking mechanisms (to prevent pilfering), the idea quickly took hold.²

The conflict in Vietnam created a large demand for McLean's containers.³ With the U.S. military needing a way to quickly and efficiently move massive amounts of war materiel to the jungles of Southeast Asia, containers saw heavy use. By 1968, McLean's containers had the industry's attention, with the International Organization for Standardization (ISO) issuing its first standard.⁴ Shortly thereafter, the ISO issued additional standards in identification and size, giving rise to the 20 and 40 foot common containers in use today. This set the groundwork for a new form of low cost intermodal transportation.

While ports initially resisted the shift to containers,⁵ the cost savings of up to 50% was hard to ignore. When international maritime trade boomed, ports quickly came onboard. By the late 1960s, ships slid down the ways with the ability to carry 1,000 TEUs (twenty-foot equivalent units). While this pales in comparison to the 20,000+ TEU vessels available today, 1000 TEU was enormous for its time. The number of countries with ports capable of servicing container vessels jumped from 1% in 1966 to 90% in 1983. Costs to ship cargo dropped dramatically from nearly \$6/ton to less than \$0.25/ton.⁶

With rapid expansion, many companies initially tried to cash in on the intermodal container craze. However, competition grew fierce and industry consolidation began. Paralleling the railroad consolidation in the U.S. in 1980, containerized shipping evolved into a business run by giant operators. When the dust settled, the entire market, responsible for transporting trillions of dollars in global trade, consisted of ~10 companies.

Current Market State

Since 2000, the shipping market has consolidated. While the top three shippers combined for 23.7% of overall market share, by 2016, the same top three companies comprised an astonishing 39.9% of the market.⁷ The top shipper, Maersk Sealand, expects to continue growth through 2017 in the wake of Hanjin Shipping's bankruptcy in 2016, pushing the top three shippers to an estimated 42.8% market share.⁸ The main reason for consolidation is the pace of mergers and acquisitions in maritime shipping, with five major shipping companies closing up shop from 1999-2016.⁹ Maersk Sealand alone is responsible for more than 3 million TEU in capacity, capturing nearly 15% of the global market.¹⁰

While the numbers alone are not particularly insightful, the trends provide an opportunity for analysis. The Hanjin bankruptcy is a symptom of the shipping industry's financial troubles.

While Maersk increased shipping volume by 9% in 2016, its total revenues dipped by 13%, mostly due to the sharp 21% decline in maritime shipping rates.¹¹ The effect on maritime security may not be obvious at first glance. Still, as one looks deeper into the industry's financial woes, new vulnerabilities emerge.

Current Regulatory Framework

Before investigating the impact of market consolidation, dipping freight rates, and the evolution of containerized shipping, it is important to look at the current state of security programs. The three primary security initiatives directed at maritime container shipping include the Container Security Initiative (CSI), Customs-Trade Partnership Against Terrorism (C-TPAT), and the International Ship and Port Security (ISPS) code.¹² Each, in turn, provides its own benefits to maritime security that may require re-evaluation in the face of industry changes.

Container Security Initiative

The United States developed CSI as a response to the September 11, 2001 terrorist attacks.¹³ U.S. officials were quick to identify maritime shipping as a possible threat vector for terrorism. The program's "core elements" are to 1) identify high-risk containers, 2) employ screening before shipping, and 3) leverage technology to prevent impeding commerce. It is the only program of the three identified with the sole focus of improving *container* security. The program has seen uncertain success, but in 2017, the program boasts that it prescreens over "80 percent of all maritime containerized cargo imported into the United States."¹⁴

By employing teams of customs officers at ports around the world, CSI casts a global net.¹⁵ With 58 ports participating under treaties with the United States, the host countries receive a purported benefit of shared intelligence and a better working relationship with U.S. officials.¹⁶ The customs officials use technology to screen containers as they are loaded, or prior to loading, on ships destined for the United States.¹⁷ X-rays, radiological detectors, and bomb-sniffing canines are standard methods to ensure security of the US-bound containers.¹⁸

Still, the program has limitations. To start, the inspectors are primarily concerned with containers with the United States as a final destination.¹⁹ With the growth of mega-ships, and a mix of containers destined for a variety of international destinations, the inspectors are unable to screen non-U.S. bound containers with the same level of detail. Further, while technology is getting better, the impact of larger ships capable of carrying 20,000 containers or more means that the potential delay for finding and inspecting U.S. containers has increased. Finally, while the goal has always been 100% coverage for U.S.-bound containers, CSI is still only able to pre-screen 80% since its 2002 inception. Industry consolidation provides an opportunity to re-invigorate CSI, which appears to have plateaued.

C-TPAT

While not focused on containerized shipping, C-TPAT is another important CBP program addressing the security of maritime shipping. Since so much shipping consists of containers,

the broad C-TPAT requirements have a distinct impact on the container market. Like CSI, C-TPAT grew out of the response to the September 11, 2001 attacks. Its primary focus is on detecting and interdicting the shipment of Weapons of Mass Destruction (WMD).²⁰ The C-TPAT program officials set guidelines for port security at foreign locations in exchange for preferential treatment and training opportunities.²¹

C-TPAT is distinct from CSI in that C-TPAT allows participation from industry players, whereas CSI focuses on foreign port authorities. In addition, C-TPAT covers other modes of transportation beyond the maritime domain. The primary driver for encouraging participants to increase their own security measures is the financial incentive of quicker customs processing upon arriving into the U.S.²² The concept is similar to the TSA Pre-Check program at U.S. airports. While some individuals will see a distinct financial advantage in bypassing otherwise unreasonable lines (either at the airport or ports of entry), other individuals may see no advantage and therefore little incentive to participate.

U.S. regulators may be able to leverage a consolidated maritime shipping industry to improve C-TPAT's reach and overall effect. Still, given that the program is designed to create incentives for firms conducting business in the U.S., new approaches may be necessary to address the fact that all of the top maritime shipping companies are global operators.

ISPS

The International Ship and Port Facility Code (ISPS) is an international treaty adopted under the Safety of Life at Sea framework.²³ The International Maritime Organization (IMO) developed the code in the aftermath of the September 11, 2001 terrorist attacks in an effort to bolster and standardize security in the maritime domain. As with all international treaties, it is up to individual nations to implement the agreement. The United States has implemented some of the ISPS regulations through the Maritime Transportation Security Act of 2002 and follow-on regulations.²⁴

The ISPS was designed to create a standard for nations to follow, and to assist industry in complying with the landscape of security regulations. While the code applies broadly to many parts of the maritime transportation system, the specific mention of containers is rare. No part of the ISPS code is dedicated to container security or the special considerations necessary for container transport.²⁵

As a framework mechanism to address shipping security, the ISPS code provides an in-place avenue for improving containerized cargo security in the face of the industry's changes.²⁶

Automated Targeting System

CBP uses a system called ATS (Automated Targeting System) to fuse intelligence and law enforcement data for guiding CSI and C-TPAT programs. CBP maintains internal guidance for how and when to use ATS output, but it generally includes information about various shipping elements, such as origin or en route ports of call. As one of the internal CBP products designed to work under both the CSI and C-TPAT frameworks, it provides a tool for managing risk and for smart decision making in maritime transportation security.²⁷

Given its unique situation, straddling many aspects of CBPs security responsibilities, ATS may provide one way to leverage the industry's consolidation into bolstering security in the future, as discussed below.

Economic and Security Effect from Consolidation

The maritime shipping industry's consolidation has substantial ripple effects on economic and security concerns. Economic incentives, such as those under C-TPAT, are closely related to the industry's security posture.

One of the biggest changes coming from consolidation is the formation of new strategic alliances.²⁸ For example, the World Shipping Council now controls approximately 90 percent of global container capacity.²⁹ The development of larger ships puts pressure on shipping rates. Alliances are necessary to compete and maintain profit as shippers face the conundrum of increased capacity and decreased margins.³⁰ Separately, regulatory costs of meeting environmental requirements eat into profits.³¹

As profit margins shrink and shipping companies merge and create alliances, security professionals should take note. While the impact on revenue does not directly affect companies' duty to meet security regulations, it does mean that security must compete with other operational demands. As Hanjin line bled red ink, it is hard to imagine that self-policing their ISPS compliance was a top concern for them. To complicate matters, many security programs have stagnated, including CSI and C-TPAT as described above. With no evolution in the regulatory environment, shippers are incentivized to maintain the status quo.

Some experts believe that maritime security concern has peaked.³² Counter-piracy efforts are effective, while importers and exporters have reached a happy equilibrium with port states.³³ As Bennett notes, "[a]s the perception of threat falls, so will the cost of protection." This may be an industry boon, but it belies the fact that not all parties value security equally. During the zenith of counter-piracy efforts, the extra security efforts in place undoubtedly ensure a safer maritime shipping infrastructure.³⁴

On the positive side, industry consolidation should make inspecting and enforcing compliance easier, with fewer entities to track. As companies go defunct and merge, it becomes one less "account" for C-TPAT.³⁵ While maritime shippers represent a very small part of C-TPAT (less than 1 percent of overall participants), they are some of the biggest players in terms of sheer volume.³⁶ The opportunity for increased per capita engagement is difficult to overlook. None of the biggest maritime shippers are U.S.-based companies. With fewer companies involved, regulators can streamline international outreach and perhaps garner broad agreements on common concerns.

As the shipping industry changes, the economic incentives to "participate" in voluntary security programs may shift. Still, the changes open new avenues of outreach using some of the renewed approaches discussed in the next section.

U.S. Response Proposal

In the face of a changing maritime shipping industry, many agree that it is time to re-evaluate and adjust security strategies. As discussed above, the U.S. has several robust framework programs in place that are capable of providing the foundation for an evolved maritime security system. In order to best respond to the new dynamics of maritime shipping, particularly in containerized cargo, key changes in resources, improved ATS, and higher incentive tiers for C-TPAT and CSI may make all the difference

Resources

The first element of improving security for containerized cargo is bolstering resources. As ships grow and the industry consolidates, shipping containers will become more centralized. While 20,000 TEU destined for the United States may have previously been spread over 3 or 4 vessels, all 20,000 TEU may now be located on a single ship. In order to keep commerce flowing without undue delay, CBP needs additional inspectors. The U.S. Coast Guard needs additional inspectors. Finally, planners must allocate funding resources to improving screening technology.

Profit margins are razor thin, and shipping companies are less likely to pour their own resources into meeting security requirements unless they are absolutely required. Adding resources on the enforcement side will prevent a pendulum swing on the industry side, providing consistency for future changes in the industry. No matter how the industry changes in the future, a robust, fully-resourced enforcement enterprise can respond more nimbly to market dynamics.

Improved ATS

The second most promising mechanism for improving maritime shipping security is developing, growing, and maintaining a robust Automated Targeting System. ATS links the two major U.S. security programs for CBP, CSI and C-TPAT. One can reference the Transportation Security Administration's machinations in trying to keep up with the speed of air travel to show the benefit of "smart" targeting criteria.

While the ATS risk analysis dimensions provide a good baseline, the system can certainly benefit from input improvements. Increased intelligence sharing and gathering, combined with closer partnerships with industry could generate better results.

One of the main benefits of maritime shipping industry consolidation is that there are now fewer entities with which to deal. One can imagine that dealing with fewer entities could mean closer (and better) relationships between industry and regulators. Closer working relationships with major maritime shipping companies will lead to better intelligence and better ATS decision outputs.

Combined with an increase in resources devoted to learning more about the industry, an enhanced ATS can keep containerized cargo secure through better risk-based response

action. It will also ensure that shippers have an incentive to “play along” by streamlining the process and reducing delay which directly eats into their profits.

Higher Incentive Tiers

A final approach that may improve containerized shipping security is providing additional incentive tiers at higher levels. As more and more C-TPAT partners reach top tiers, it may be necessary to create even higher tiers, maintaining an incentive for better-than-average performance. Incentive tiers that increase with time and overall performance are common across disciplines with California low-emission high occupancy vehicle lane access and TSA PreCheck programs as notable examples.³⁷

As more C-TPAT partners reach the highest tier, the marginal benefit of the improved processing time decreases. While one approach may be to make the requirements to reach the tier more restrictive, similar to the California carpool lane example, another option is to add higher tiers, creating additional exclusivity and benefits to the “best” security partners. Only the most sophisticated and capable partners would likely be able to meet increased guidelines.

Consolidated maritime shippers can afford to implement a higher security standard if presented with better incentives. While the incentives may not be worthwhile to smaller entities, the largest companies would perceive a drastic incentive with only a 1 or 2 percent decrease in processing time. New “mega” shipping companies provide an opportunity for regulators to offer such a higher-level incentive.

Conclusion

The maritime shipping industry has evolved. While many of the security programs were developed immediately in the aftermath of the September 11, 2001 terrorist attacks, the past 16 years have introduced a new norm. Industry consolidation, reduced focus on security due to a decrease in perceived risk, and decreased profits have created a new system of incentives for industry partners.

The current maritime transportation regulations provide a good framework. Still, the status quo is not acceptable, and changes are needed. In the face of a changed industry, several strategic changes would create a better system that is capable of responding to current threats while insulating itself against future industry change.

Increased resources, better application of CBP’s ATS, and better incentive tiers are methods of improving the current security system, each with their own benefits. As the industry consolidates, new opportunities to create a safer maritime transportation system are becoming apparent. Regulators should seize the opportunity before the industry changes so much as to render the current framework unusable in attempting to meet future changes.

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Notes

- 1 "A Complete History of the Shipping Container," *Container Home Plans*, 25 Mar 2015.
- 2 Jean-Paul Rodrigue, "The Geography of Containerization: Half a Century of Revolution, Adaptation, and Diffusion," *GeoJournal*, September, 2008.
- 3 "A Complete History of the Shipping Container," *Container Home Plans*, 25 Mar 2015.
- 4 ISO 338 initially only defined terminology and dimensions.
- 5 This was mainly due to union pressures, with unions fearing the loss of stevedores given that containers required fewer laborers to load/unload than traditional cargo methods.
- 6 These numbers are adjusted for inflation.
- 7 "Global Container Market: Then and Now," *Tuscor Lloyds Global Logistics*, 9 Jan 2017. The top three shippers in both statistics are Maersk Sealand, Evergreen, and P&O Nedlloyd.
- 8 Ibid.
- 9 Ibid.
- 10 Dan Wang, "A Guide to the Largest Ocean Carriers in the World," *Flexport*, Accessed 14 June 2017.
- 11 James Sands, "Maersk Line Increases Market Share During 2016's Tough Container Shipping Line Environment," *Seeking Alpha*, February 12, 2017.
- 12 Michael Edgerton, *A Practitioner's Guide to Effective Maritime and Port Security*, (New York:John Wiley & Sons, 2013):23-24.
- 13 "CSI: Container Security Initiative," <https://www.cbp.gov>.
- 14 Ibid.
- 15 Michael Edgerton, *A Practitioner's Guide to Effective Maritime and Port Security*, (New York:John Wiley & Sons, 2013): 112.
- 16 Ibid.
- 17 Ibid.
- 18 Ibid.
- 19 "CSI: Container Security Initiative," <https://www.cbp.gov>.
- 20 "C-TPAT: Customs-Trade Partnership Against Terrorism," <https://www.cbp.gov/border-security/ports-entry/cargo-security/c-tpat-customs-trade-partnership-against-terrorism>.
- 21 Michael Edgerton, *A Practitioner's Guide to Effective Maritime and Port Security*, (New York:John Wiley & Sons, 2013): 23-24.
- 22 Ibid.
- 23 Maritime (ISPS Code) Regulations, Maritime Transport Decree 2013, International Maritime Organization.
- 24 33 CFR 101-107.
- 25 Maritime (ISPS Code) Regulations, Maritime Transport Decree 2013, International Maritime Organization.
- 26 Ibid.

- 27** Maritime Security: Progress and Challenges in Implementing Maritime Cargo Security Programs, GAO-16-790T, July 7, 2016.
- 28** Greg Knowler, "Global Shippers Sound Alarm on Alliances, Consolidation," *Joc.com*, 29 May 2017.
- 29** Ibid.
- 30** Ibid.
- 31** Mike Antuono, "Plagued Global Maritime Industry Spurs Consolidation," *The Stillman Exchange*, November 15, 2016.
- 32** Thomas Bennett, "Maritime Security at a Crossroads," *The Maritime Executive*, April 26, 2015.
- 33** Ibid.
- 34** Ibid.
- 35** "C-TPAT: Customs-Trade Partnership Against Terrorism," <https://www.cbp.gov/border-security/ports-entry/cargo-security/c-tpat-customs-trade-partnership-against-terrorism>.
- 36** Ibid.
- 37** The California low emission vehicle program allowed certain high efficiency vehicles access to restricted occupancy lanes. As more vehicles reached the standard, regulators increased the standard. For example, while hybrid vehicles were initially eligible, now only purely electric vehicles earn the extra incentive. Similarly, TSA PreCheck began as a system used by relatively few people. Now with more people using the TSA "fast lane," additional service tiers, including programs like CLEAR, require higher standards in exchange for increased incentives. <https://www.arb.ca.gov/msprog/carpool/carpool.htm>

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