A Conceptual Risk Assessment Methodology for Maritime to Rail Intermodal Service

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How can we minimize the risk of intermodal containers being compromised or used as a weapon of mass destruction (WMD) from entering the U.S. from foreign or “Outside the Continental United States” (OCONUS) ports and transferred to railroad and truck for movement inland?
Purpose of Model

- Assess the risk of shipping intermodal containers from OCONUS ports through international waters and U.S. ports to inland destinations via rail and truck

- Assessment locations and areas of interest
  - OCONUS ports of origin and territorial waters
  - In-transit via sea-lanes, straits, canals and points of known risk
  - Entering U.S. territorial waters and ports

- Security measures
  - Physical
  - Procedural and regulatory
Overview of Maritime Container Security

- SAFE Port Act of 2006 – DHS, with USCG, responsible for maritime transport security
- Over half of the container security measures occur outside of US jurisdiction
- DHS & USCG have a layered security approach:
  - U.S. destined ships/vessels at ports of origin
  - In-transit in international waters
  - U.S. waterways and ports
- At port of origin
  - 24-Hour Advanced Manifest Rule
  - Container Security Initiative (CSI)
  - Customs-Trade Partnership Against Terrorism (C-TPAT)
Overview (Cont.)

- International Ship and Port Facility Security (ISPS) Code

**In-transit**
- Operation Safe Commerce (OSC)
- Smart Box Initiative
- Ship Security Alert System (SSAS)
- Automated Targeting System (ATS)
- 96-Hour advance notice of arrival

**U.S. waterways and ports**
- National Targeting Center (NTC)
- Maritime Intelligence Fusion Center (MIFC)
Overview (Cont.)

- Operation Port Shield
- Automatic Identification System
- Area Maritime Security Committee
- Port security assessment program
- Transportation Worker Identification Card (TWIC)
- Non-intrusive inspection Technology
- Guarding In-between U.S. Ports
- Port security grants
To/At the Foreign Port and Waters

- **Physical** – screening and monitoring, surveillance, fencing, access control and intrusion detection
- **Operational** – Incl. information security & credentialing
- **Procedural** – Host nation laws and regulations, port authority/operator procedures, transportation providers and U.S. (i.e. CBP and USCG)

![Vehicle & Cargo Inspection System (VACIS)](image1)

![Port Security Camera](image2)
In Transit

- Small boat, combined (traffic) and insider threats
- Constraints – canals, straits and constricted areas
- Known piracy areas (i.e. Somalia & Straits of Malacca)
- Security measures and forces – onboard, on patrol and available in international waters
- Length and route of sailing/sea lane
Multi-National Naval Exercise - Strait of Malacca

Escort in Strait of Malacca

Strait of Malacca
Requirements In U.S. Waters/Ports

- Physical measures
  - USCG and harbormaster patrols
  - Access control, surveillance, lighting and intrusion detection
  - High interest vessel boarding
  - Security operations, such as VIPR
  - Technology based

- Regulatory and procedural
  - TWIC
  - Operation Port Shield
  - Targeting & intelligence sharing
  - Guarding in-between U.S. Ports
  - Area Maritime Security Committee
# U.S. Protective Measures for International Container Moves

<table>
<thead>
<tr>
<th>Entity</th>
<th>Points of Concern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppliers</td>
<td>C–TPAT</td>
</tr>
<tr>
<td>Draymen</td>
<td>Local control</td>
</tr>
<tr>
<td>Railroad terminal</td>
<td>Local control</td>
</tr>
<tr>
<td>Railroad line haul</td>
<td>Local control</td>
</tr>
<tr>
<td>Small regional container port</td>
<td>Varies</td>
</tr>
<tr>
<td>Load center container port</td>
<td>CSI</td>
</tr>
<tr>
<td>Feeder container line</td>
<td>Varies</td>
</tr>
<tr>
<td>Line haul container line</td>
<td>C–TPAT</td>
</tr>
</tbody>
</table>
Stakeholder Engagement

- Key gaps are along the information flows
- Stakeholders will include:
  - On the seller’s side
    - Manufacturer
    - Export sales agent (e.g. trading company)
    - Exporter
    - Forwarder
  - On the buyer’s side
    - Consignee
    - Importer of record
    - Customs broker
Moving Beyond Modal Specific Solutions

- Segmenting the supply chain into flows:
  - Physical
  - Information
  - Financial flows
- Stakeholders with the maximum opportunity for awareness are:
  - Manufacturers
  - Exporters
  - Intermediaries
  - Importers
  - Consignees
Supply Chain Operational Reference Model

Plan/Enable

- Plan
- Source
- Make
- Deliver
- Return

Your Organization

- Internal or External Suppliers
- Internal or External Customers

Supplier

- Internal or External

Source

Make

Deliver

Return

Customer

- Internal or External

Customers’ Customer
Key Maritime Physical Flows

- Manufacturer
  - The one party who knows the item
- Exporter
  - The one party who likely knows who the buyer is
  - “Household goods” often move with little scrutiny
- Domestic Carrier
  - Export Packer
    - NVOCC
      - Port/Terminal
      - Marine Carrier
      - Port/Terminal
      - Deconsolidator (NVOCC)
  - Domestic Carrier
- Consignee
- Importer
Maritime Export Informational Flows

Information Codes:
1. Purchase order
2. Export license
3. Forwarder instructions
4. Carrier booking
5. Bill of lading
6. House bill
7. Packing list
8. Export declaration
9. Dock receipt
10. Advance shipping notice
11. Ship’s manifest
12. Commercial invoice
13. Notice of shipment
Maritime Financial Flows

1. Letter of credit (used for large transactions)
2. Open account (buyer pays seller after receipt)
3. Cash in advance (May flow thru a bank, but not required)
Maritime Supply Chain—Physical Flow

1. **Foreign Supplier**
   - Dray to **Foreign Feeder Port**

2. **Foreign Feeder Port**
   - Dray to **Rail Yard/Intermodal Ramp**
   - Rail Linehaul to **Rail Yard/Intermodal Ramp**

3. **Rail Yard/Intermodal Ramp**
   - Dray to **Foreign Load Center Port**

4. **Foreign Load Center Port**
   - Dray to **U.S. Feeder Port**
   - (4) Short Seahaul to **U.S. Port of Arrival**

5. **U.S. Feeder Port**
   - Dray to **Rail Yard/Intermodal Ramp**
   - Rail Linehaul to **Rail Yard/Intermodal Ramp**

6. **Rail Yard/Intermodal Ramp**
   - Dray to **U.S. Port of Arrival**

7. **U.S. Port of Arrival**
   - Dray to **U.S. Consignee**
   - Ocean Linehaul to **Foreign Load Center Port**
## Permutations for Container Shipments

<table>
<thead>
<tr>
<th>Route</th>
<th>Foreign Side</th>
<th>U.S. Side</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 4</td>
<td>Dray to feeder port, water to load center</td>
<td>Arrival port to feeder port, dray to consignee</td>
</tr>
<tr>
<td>1 to 5</td>
<td>Dray to feeder port, water to load center</td>
<td>Arrival port dray to RR line–haul, dray to consignee</td>
</tr>
<tr>
<td>1 to 6</td>
<td>Dray to feeder port, water to load center</td>
<td>Dray to consignee</td>
</tr>
<tr>
<td>2 to 4</td>
<td>Dray to RR for transit to load center</td>
<td>Arrival port to feeder port, dray to consignee</td>
</tr>
<tr>
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<td>Dray to consignee</td>
</tr>
<tr>
<td>3 to 4</td>
<td>Dray to load center port</td>
<td>Arrival port to feeder port, dray to consignee</td>
</tr>
<tr>
<td>3 to 5</td>
<td>Dray to load center port</td>
<td>Arrival port dray to RR line–haul, dray to consignee</td>
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<tr>
<td>3 to 6</td>
<td>Dray to load center port</td>
<td>Dray to consignee</td>
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# Foreign Risk Potential for International Container Moves

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<tr>
<th>Entity</th>
<th>Points of Concern</th>
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</thead>
<tbody>
<tr>
<td>Suppliers</td>
<td>Their supply chains, employees, site access</td>
</tr>
<tr>
<td>Draymen</td>
<td>Employees, pre- and post-empty container pickup, routes taken</td>
</tr>
<tr>
<td>Railroad terminal</td>
<td>Employees, access control</td>
</tr>
<tr>
<td>Railroad line-haul</td>
<td>Employees, routes taken, locale and duration of idling</td>
</tr>
<tr>
<td>Small regional container port</td>
<td>Employees, access control</td>
</tr>
<tr>
<td>Load center container control</td>
<td>Employees, access control, entry of other vessels</td>
</tr>
<tr>
<td>Feeder container line</td>
<td>Employees, routes taken, locale and duration of lay times, control over container acceptance, bunkering and provisioning</td>
</tr>
<tr>
<td>Line-haul container line</td>
<td>Employees, routes taken, locale and duration of lay times, control over container acceptance, bunkering and provisioning</td>
</tr>
</tbody>
</table>
The Challenge

- The problem with nodes
  - Information flows often not seamless
  - The physical flow slows or stops
  - In-transit visibility can be lost
- Determine the risk to rail and maritime and how they are interrelated
- Merge maritime and rail risk assessment logic and methodology
- Assess risk of the maritime intermodal process on railroad security for inward U.S. movements
## Risk Factors

<table>
<thead>
<tr>
<th>Consolidated Factors</th>
<th>RCRMS Factors</th>
<th>Maritime Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shipments</strong></td>
<td>1. Hazmat volume transported</td>
<td>• Hazmat/contents of intermodal containers</td>
</tr>
<tr>
<td><strong>Operations</strong></td>
<td>5. Track type, class and maintenance</td>
<td>• Condition of ports, canals and straits</td>
</tr>
<tr>
<td></td>
<td>6. Track geometry</td>
<td>• Physical features of ports, canals and straits</td>
</tr>
<tr>
<td></td>
<td>19. Operating speed</td>
<td>• Cruise, flank and restricted speeds</td>
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<tr>
<td></td>
<td>25. Overall transit time</td>
<td>• Direct vs. indirect routes and commitment</td>
</tr>
<tr>
<td><strong>Route configuration</strong></td>
<td>4. Railroad facilities</td>
<td>• Rail and intermodal facilities in ports</td>
</tr>
<tr>
<td></td>
<td>9. Grade crossings</td>
<td>• Ports, harbors and channels</td>
</tr>
<tr>
<td></td>
<td>10. Single vs. double track</td>
<td>• Canals, straits, channels and other locations where ships cross/operate in parallel</td>
</tr>
<tr>
<td></td>
<td>11. Turnouts</td>
<td></td>
</tr>
<tr>
<td><strong>System network</strong></td>
<td>2. Rail traffic density</td>
<td>• Sea lane density and capacity constraints</td>
</tr>
<tr>
<td></td>
<td>3. Route length</td>
<td>• Chosen sea lane via routing and ports of call</td>
</tr>
<tr>
<td></td>
<td>18. Shared track with passenger</td>
<td>• Shared ports, canals and straits</td>
</tr>
<tr>
<td></td>
<td>23. Alternate route available</td>
<td>• Shipping commitment route, risk and cost</td>
</tr>
<tr>
<td></td>
<td>27. Rail network traffic and congestion</td>
<td>• Canals, straits, ports and security measures</td>
</tr>
<tr>
<td>Consolidated Factors</td>
<td>RCRMS Factors</td>
<td>Maritime Factors</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>----------------------------------------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Technology safety measures</td>
<td>7. Signal and train control</td>
<td>• NAVAIDs, ATONs and GPS, and harbor operations centers</td>
</tr>
<tr>
<td></td>
<td>8. Wayside detectors</td>
<td></td>
</tr>
<tr>
<td>Threats, risks and vulnerabilities</td>
<td>12. Proximity to iconic targets</td>
<td>• Iconic targets near ports and along sea lanes</td>
</tr>
<tr>
<td></td>
<td>13. Environmentally significant areas</td>
<td>• Coastal zones and adjacent sensitive areas</td>
</tr>
<tr>
<td></td>
<td>14. Population Density</td>
<td>• Housing/commercial development at ports</td>
</tr>
<tr>
<td></td>
<td>15. Venues along route</td>
<td>• Fishing, cruise and waterfront destinations</td>
</tr>
<tr>
<td></td>
<td>17. High consequence areas</td>
<td>• Petrochemical plants/industry near ports</td>
</tr>
<tr>
<td></td>
<td>21. Known threats</td>
<td>• Piracy, smuggling, high value target</td>
</tr>
<tr>
<td></td>
<td>24. Past incidents</td>
<td>• Somali piracy, intelligence driven, etc.</td>
</tr>
<tr>
<td>Safety and incident response</td>
<td>16. Emergency response capabilities</td>
<td>• Port/international response, and tracking</td>
</tr>
<tr>
<td></td>
<td>20. Maintenance and repair facilities</td>
<td>• Facilities, level and capabilities</td>
</tr>
<tr>
<td></td>
<td>22. Safety/security risk mitigation measures</td>
<td>• Foreign and US, and in-transit measures</td>
</tr>
<tr>
<td></td>
<td>26. Training and skills of crews</td>
<td>• USCG/international training and licensing</td>
</tr>
</tbody>
</table>


Way Forward

- Develop a risk assessment methodology to ensure the risk is minimized to the inward movement by rail
- Risk assessment to be consistent with the concept of 49 CFR 172, Appendix D, and RCRMS
- The risk assessment methodology will provide an overall assessment of risk based on the above factors
- The physical security measures, operations and procedural process in place at/along:
  - Host nation supply chain, and territorial waters and ports
  - In-transit
  - U.S. territorial waters and ports
Learning Objectives

1. Develop the awareness of the need for and application of an intermodal risk assessment tool
2. Engage industry stakeholders in identifying and filling gaps in intermodal risk assessment criteria
3. Raise the awareness of stakeholders of the need to move beyond modal-specific solutions
4. Encourage further research into the potential risks unique to intermodal traffic
Questions?

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