Next Generation Vessels

Cruise and Cargo Facilities — A tale of two Ports

November 17, 2009

Facilities Engineering Seminar

American Association of Port Authorities

Alliance of the Ports of Canada, the Caribbean, Latin America and the United States

Bermello, Ajamil & Partners, Inc.

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Enhancing cargo efficiencies – preparing for the future
Container vessels

The earliest container ships were converted tankers (T2 tankers).

In 1951 the first purpose-built container ship in the USA was the Ideal-X which carried 58 metal containers between Newark, New Jersey and Houston.
Today, approximately 90% of non-bulk cargo worldwide is transported by container vessels.
Ship Shape

The container ships squeezing into U.S. ports are nearly a quarter of a mile long. A look at how the big vessels stack up:

<p>| | |</p>
<table>
<thead>
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</thead>
<tbody>
<tr>
<td><strong>TITANIC</strong></td>
<td>883 feet</td>
</tr>
<tr>
<td><strong>CMA CGM HUGO</strong></td>
<td>1,095 feet</td>
</tr>
<tr>
<td><strong>QUEEN MARY 2</strong></td>
<td>1,132 feet</td>
</tr>
<tr>
<td><strong>EMMA MAERSK</strong></td>
<td>1,302 feet</td>
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</tbody>
</table>

Note: Drawings are schematic

1Number of feet that the hull is beneath the surface of the water  
2Twenty-foot equivalent units, a standard measure of containerized cargo

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<tr>
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<th><strong>CMA CGM HUGO</strong></th>
<th><strong>EMMA MAERSK</strong></th>
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<tbody>
<tr>
<td><strong>ROUTE</strong></td>
<td>Far East/</td>
<td>Far East/Europe</td>
</tr>
<tr>
<td></td>
<td>U.S. West Coast</td>
<td>via Suez Canal</td>
</tr>
<tr>
<td><strong>WIDTH</strong></td>
<td>140 feet</td>
<td>183 feet</td>
</tr>
<tr>
<td><strong>DRAFT</strong></td>
<td>43–47 feet</td>
<td>46 feet</td>
</tr>
<tr>
<td><strong>CONTAINER</strong></td>
<td>8,200 TEUs²</td>
<td>11,000 TEUs</td>
</tr>
<tr>
<td><strong>CREW</strong></td>
<td>23</td>
<td>14</td>
</tr>
</tbody>
</table>

Sources: CMA CGM; A.P. Moller-Maersk Group; WSJ research
The Maersk Sealand Atlantic Class Vessel is the largest container vessel to operate at POM

- Container capacity of 4,400 TEUs
- Length of 950-feet
- Maximum draft of 35-feet
- Necessary to prepare for future opportunities - 2015
The Maersk Sealand S Class Vessel is anticipated to operate at POM:
- Container capacity of 6,600 plus TEUs
- Length of 1,138-feet
- Maximum draft of 48-feet
Port of Miami 2035 master plan, capital improvement plan

- Channel deepening to 52-ft, widening adtl. 100-feet
- Deepening of the existing 1,500-ft. diameter Lummus Island turning basin to 50-feet
Future POM cargo facilities

• Meet the marine requirements for safe ship movements

• Focus on efficiencies...
  • Movement of containers to and from vessel – quick turns
  • Expedite inspection and gate services for higher traffic flows
  • Use technology
  • Adding tunnel for movement bypassing downtown
  • Possible on-port rail linkages

• Interface with off-port intermodal facilities
Cruise terminals must process more people than any international airport.
Ever growing mega ships
The new mega cruise ships

- **Oasis / Allure**: 5,400 Passengers
- **Freedom of the Seas**: 4,370 Passengers
- **Queen Mary 2**: 2,620 Passengers
Oasis of the Seas

- LOA of 1,184-feet
- 220,000 Tonnes
- Air Draft of 239-feet
- Max Beam of 184-feet
- 5,400-pax lower berths
- 2,000-crew members
Average passengers/ship by year of construction
Cruise ship trends
Homeport passenger movements …… < 1,500 passengers
Homeport passenger movements ..... 6,000 passengers
Evolution of the cruise terminal

TEMPORARY FACILITY

CONVERSION OF EXISTING BUILDING

NEW FACILITY

JOINT DEVELOPMENT
Progression of terminal size (ft$^2$)

Number of passengers:
- 1,800
- 2,600
- 3,600
- 5,400

Terminal size:
- 50,000
- 100,000
- 150,000
- 200,000
- 250,000
- 300,000
How to design a cruise terminal

• There are CBP guidelines
• Cruise line input is essential
• Stakeholder input is important
• However.................................
Putting theory into practice

• Cruise lines do not have an uniform concept

• People within the same cruise line have different opinions as to how the facility should be developed

• Security design is not uniform from place to place

• There is not one standard way of designing a facility
HOW TO HANDLE 13,000 PEOPLE PER DAY AND 32,000 PIECES OF LUGGAGE
Port Everglades Terminal 18 (Nov. 6, 2009 Inaugural)
Terminal 18 Overview – large retrofit plan

- Designed & Built in less than 18-months
- 240,000 sq. feet
- Phase 1 – 10,000 sq. m. & Phase 2 – 14,000 sq. meters
- Simultaneous embarkation and debarkation
- Curbside to ship in 15 minutes
- 90 check-in counters
- Seating for 3,000 passengers
- 16,000 piece baggage lay-down area
- 1,000 parking spaces
- Segregated bus, taxi, car and provisioning areas
Port Everglades Terminal 18, *Oasis of the Seas*
Terminal lessons learned

- Keep it simple – easy to say, hard to do…
- Involve the cruise line and stakeholders from the start
- Define performance standards (embark and debark)
  - Check-in
  - Security
  - Baggage
  - Provisioning
  - GTA
- Understand your design vessel – design to those details
The future generation

- An integrated terminal
- A part of the waterfront
- It can both make the City a homeport AND a port-of-call
Singapore International Cruise Terminal
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