Best practices for improving coordination at Ports

J. SHIN
General Manager
Busan Port Authority Euro Office

BPA Euro office
P.O. Box 30161
3001 AD, Rotterdam
The Netherlands

Phone: +31 10 261 9930
E-mail: jsshinbpa@gmail.com

June 11th, 2018
1. Port of Busan & Busan Port Authority

2. Main initiatives for the efficiency & coordination

3. Achievement & Challenges
Port of Busan: Geographical location

- Strategically located between two countries, China and Japan
- Having 25% of world population, 20% of world GDP within 3 hours’ flight distance

- Busan port, located at a strategic point in the world logistics
  - Gateway port on the East-West and North-South routes
- Busan, the future starting point of transcontinental railways, run from Korea through China and Russia, to Europe
Port of Busan: Location & Connectivity

- **In 2017**, 56 container carriers in total used Busan as *transshipment hub*

- **29 carriers** handled more than 10,000 TEU transshipment moves

- **19 carriers** handled more than 100,000 TEU transshipment moves

- **8 carriers** handled more than $\frac{1}{2}$ million TEU transshipment moves
Port of Busan

Busan Port
(total 41 container berths, 19.13M handling capacity, 12.5 km of quay length)
Busan Old Port
Busan New Port

- Opening: 2006
- 23 berths, under operation
- Handling T/put: 12.8M TEU
- Water depth: 15 ~ 17m
Busan Port t/put

(Unit: '000 TEU)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Local</th>
<th>T/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>17,046</td>
<td>8,898</td>
<td>8,148</td>
</tr>
<tr>
<td>2013</td>
<td>17,686</td>
<td>8,938</td>
<td>8,748</td>
</tr>
<tr>
<td>2014</td>
<td>18,683</td>
<td>9,238</td>
<td>9,445</td>
</tr>
<tr>
<td>2015</td>
<td>19,469</td>
<td>9,363</td>
<td>10,105</td>
</tr>
<tr>
<td>2016</td>
<td>19,432</td>
<td>9,608</td>
<td>9,823</td>
</tr>
<tr>
<td>2017</td>
<td>20,493</td>
<td>10,268</td>
<td>10,225</td>
</tr>
</tbody>
</table>

Total 5.3%
L/C 5.9%
T/S 3.9%
### Busan Port t/put by country

- **Top three nations (CHN, USA, JPN) account for 55% of total volume**
  - 47.2% of L/C cargo, 61.1% of T/S cargo

(Unit: TEU, %)

<table>
<thead>
<tr>
<th>Country</th>
<th>2016</th>
<th></th>
<th></th>
<th>2017</th>
<th></th>
<th></th>
<th>Growth rate(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TTL</td>
<td>Gateway</td>
<td>T/S</td>
<td>TTL</td>
<td>Gateway</td>
<td>T/S</td>
<td></td>
</tr>
<tr>
<td>CHINA</td>
<td>4,904,803</td>
<td>1,857,156</td>
<td>3,047,647</td>
<td>5,101,802</td>
<td>1,991,425</td>
<td>3,110,377</td>
<td>4.02 7.23 2.06</td>
</tr>
<tr>
<td>US</td>
<td>2,834,482</td>
<td>1,341,152</td>
<td>1,493,330</td>
<td>2,987,284</td>
<td>1,461,611</td>
<td>1,525,673</td>
<td>5.39 8.98 2.17</td>
</tr>
<tr>
<td>JAPAN</td>
<td>2,811,006</td>
<td>1,340,600</td>
<td>1,470,406</td>
<td>2,938,105</td>
<td>1,346,642</td>
<td>1,591,463</td>
<td>4.52 0.45 8.23</td>
</tr>
<tr>
<td>CANADA</td>
<td>520,963</td>
<td>193,610</td>
<td>327,353</td>
<td>689,108</td>
<td>238,469</td>
<td>450,639</td>
<td>32.28 23.17 37.66</td>
</tr>
<tr>
<td>VIETNAM</td>
<td>545,213</td>
<td>341,375</td>
<td>203,838</td>
<td>600,522</td>
<td>381,962</td>
<td>218,560</td>
<td>10.14 11.89 7.22</td>
</tr>
<tr>
<td>MEXICO</td>
<td>541,286</td>
<td>310,540</td>
<td>230,746</td>
<td>541,686</td>
<td>311,014</td>
<td>230,672</td>
<td>0.07 0.15 -0.03</td>
</tr>
<tr>
<td>RUSSIA</td>
<td>370,477</td>
<td>154,976</td>
<td>215,501</td>
<td>470,078</td>
<td>192,015</td>
<td>278,063</td>
<td>26.88 23.9 29.03</td>
</tr>
<tr>
<td>THAILANDS</td>
<td>346,998</td>
<td>161,369</td>
<td>185,629</td>
<td>411,203</td>
<td>181,988</td>
<td>229,215</td>
<td>18.5 12.78 23.48</td>
</tr>
<tr>
<td>INDIA</td>
<td>382,138</td>
<td>267,920</td>
<td>114,218</td>
<td>387,669</td>
<td>277,569</td>
<td>110,100</td>
<td>1.45 3.6 -3.61</td>
</tr>
<tr>
<td>INDONESIA</td>
<td>344,457</td>
<td>170,881</td>
<td>173,576</td>
<td>359,036</td>
<td>172,954</td>
<td>186,082</td>
<td>4.23 1.21 7.2</td>
</tr>
</tbody>
</table>
### Busan Port: Transshipment hub port

(Unit: 1,000 TEU, %)

<table>
<thead>
<tr>
<th>No.</th>
<th>Port</th>
<th>t/put(2016)</th>
<th>T/S Volume</th>
<th>T/S Shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Singapore</td>
<td>30,904</td>
<td>26,268</td>
<td>85.0</td>
</tr>
<tr>
<td>2</td>
<td>Busan</td>
<td>19,373</td>
<td>9,797</td>
<td>50.6</td>
</tr>
<tr>
<td>3</td>
<td>Port Kelang</td>
<td>13,167</td>
<td>9,064</td>
<td>68.6</td>
</tr>
<tr>
<td>4</td>
<td>Tanjung Palepas</td>
<td>8,029</td>
<td>7,545</td>
<td>94.0</td>
</tr>
<tr>
<td>5</td>
<td>Jabel Ali (Dubai)</td>
<td>14,772</td>
<td>7,238</td>
<td>49.0</td>
</tr>
<tr>
<td>6</td>
<td>Hong Kong</td>
<td>19,813</td>
<td>5,060</td>
<td>30.7</td>
</tr>
</tbody>
</table>

*Source: Drewry, Container port review & forecast (2017/2018)*

**Hong Kong, converted mid-stream cargo from T/S to gateway cargo**
Port of Busan

Korea’s No.1 container port

- 75% of Korea’s total cargo (27.42M teu)
- 95% of Korea’s total T/S
**Busan Port Authority**

- Established in Jan, 2004 as a state-owned company under the Port Authority Law
- As a landlord, main income comes from terminal lease fees (44%), port dues (30%), and others (26%)
- Makes efforts to diversify the business portfolio

**Construction of Busan New Port**

**Old port redevelopment**

**Distripark development**
1. Port of Busan Port & Busan Port Authority

2. Main initiatives for the efficiency & coordination

3. Achievement & Challenges
Current environment the port industry

Advent of mega vessel

- Economies of scale, facilitating the consolidation among carriers
- More than 62 vessels of 18,000TEU, employed into the market in 2-3 years
Large vessels’ calling at Busan Port

<A number of callings at Busan Port by ship size >

<table>
<thead>
<tr>
<th>Year</th>
<th>4,000~9,000 teu</th>
<th>9,000~13,000 teu</th>
<th>13,000~18,000 teu</th>
<th>18,000 teu~</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘11</td>
<td>3,245</td>
<td>159</td>
<td>66</td>
<td>-</td>
</tr>
<tr>
<td>‘12</td>
<td>3,230</td>
<td>318</td>
<td>114</td>
<td>-</td>
</tr>
<tr>
<td>‘13</td>
<td>3,250</td>
<td>526</td>
<td>141</td>
<td>7</td>
</tr>
<tr>
<td>‘14</td>
<td>2,896</td>
<td>596</td>
<td>156</td>
<td>41</td>
</tr>
<tr>
<td>‘15</td>
<td>3,254</td>
<td>690</td>
<td>238</td>
<td>108</td>
</tr>
<tr>
<td>‘16</td>
<td>3,263</td>
<td>692</td>
<td>227</td>
<td>137</td>
</tr>
</tbody>
</table>

※ Assumption : Port MIS data(GT) converted to TEU

<A CNTR volume handled in Busan Port by ship size >

<table>
<thead>
<tr>
<th>Year</th>
<th>4,000~9,000 teu</th>
<th>9,000~13,000 teu</th>
<th>13,000~18,000 teu</th>
<th>18,000 teu~</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘11</td>
<td>6,455,955</td>
<td>360,671</td>
<td>164,635</td>
<td>-</td>
</tr>
<tr>
<td>‘12</td>
<td>6,727,617</td>
<td>949,095</td>
<td>263,873</td>
<td>-</td>
</tr>
<tr>
<td>‘13</td>
<td>6,458,203</td>
<td>1,682,134</td>
<td>372,709</td>
<td>21,000</td>
</tr>
<tr>
<td>‘14</td>
<td>6,440,472</td>
<td>2,177,038</td>
<td>573,015</td>
<td>168,946</td>
</tr>
<tr>
<td>‘15</td>
<td>6,736,583</td>
<td>2,294,439</td>
<td>971,404</td>
<td>432,589</td>
</tr>
<tr>
<td>‘16</td>
<td>6,830,242</td>
<td>2,430,821</td>
<td>918,059</td>
<td>486,794</td>
</tr>
</tbody>
</table>

※ Assumption : Port MIS data(GT) converted to TEU
Continuous investment

West Terminal (DL (-20M))

Removal of “To” Island ($309M)

Channel expansion ($103M)

<Port perspective>
- Huge investment for port construction (dredging, quay wall, etc.)
- Equipment, yard investment
- Social cost (traffic..)
- Environment issue
Global Port Community Cooperation

To share the current challenges and difficulties of each port

- **Chain Port**
  - Busan, LA, Singapore, Shenzhen, Antwerp, Felixstowe, Hamburg, etc

- **PAR (Port Authority Round Table) : 18 Ports and Countries/State**
  - Busan, Rotterdam, Long Beach, Houston, NY/NJ, Hamburg, Antwerp, Singapore, Tokyo, Shanghai, Ningbo, Guangzhou, Port Kelang, others

- **IAPH (International Association of Ports and Harbors)**
  - 180 ports in 90 countries
  - Largest Global Port Alliance (NGO)
  - Established in 1955
### Initiative for GHG Emission reduction

#### Busan Port GHG Emission

*Researched by the internal research team of BPA*

#### Emission from Vessel

<table>
<thead>
<tr>
<th></th>
<th>GHG Emission / annual / ton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CO2</td>
</tr>
<tr>
<td>Arrival &amp; Departure</td>
<td>55</td>
</tr>
<tr>
<td>During dockage</td>
<td>1,177</td>
</tr>
<tr>
<td>Total</td>
<td>55</td>
</tr>
</tbody>
</table>

#### Emission from equipment

<table>
<thead>
<tr>
<th></th>
<th>GHG Emission / annual / ton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CO2</td>
</tr>
<tr>
<td>Equipment</td>
<td></td>
</tr>
<tr>
<td>Container terminal</td>
<td>775</td>
</tr>
<tr>
<td>General piers</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>799</td>
</tr>
<tr>
<td>Road Trailer</td>
<td>710</td>
</tr>
<tr>
<td>Total</td>
<td>1,509</td>
</tr>
</tbody>
</table>
Initiatives for GHG Emission reduction

- **AMP**
  - SOx emitted from vessels accounts for more than 60% of the total in Busan.
  - Required to take measures with providing AMP during the vessels’ dockage.

- **LNG**
  - LNG, alternative energy for the vessels.
  - In response of it, it requires to review and study how to provide LNG bunkering facilities.

- **Port equipment**
  - As of now, only 40% of equipment has been transferred into eco-friendly power system.
  - More investment and detailed studies are required.

Port of Busan, on the process of implementation, is needed to get more support and coordination from the ports from the world.
Port Digitalization

- To proactively react to the digitalization of port and shipping industries
- To support the port users by adopting the digitalization at port

Combining and sharing data with port users (carriers, shippers, terminal operators, logistics companies), imperative to secure the port’s competitiveness

- Digital transformation strategy

  - Building the logistics service platform by sharing integrated data
    - Platform like Data Factory for integrating and sharing data from different systems
      - re-establishment of data code system
    - Developing a platform for sharing the port's all logistics sources
    - Platform conducting logistics deal process on Block chain
      - secure transparency and security of electronic transaction
Port Call Optimization

- Use of different standards and identifiers for locations port to port
- Shipping is using up to 700 different ports, impossible to connect to so many standards
- Data is often collected through 3rd parties, not through the information owner. So data becomes corrupt with lack transparency
- Less efficient communication

Global standardization of port information
To optimize vessel and port operations and do away with the inefficiencies.

The definition covered are broadly divided into three sectors
- (1) those used during a vessel’s call such as berth and depth
- (2) the minimum general terms a port should provide on itself
- (3) those covering events recorded during the vessel’s call at the port (the arrival, departure time>
Development plan

- Agree on business process of port calls
- Agree on minimum scope of data
- Agree on functional definitions
- Use of functional definitions by industry
- Agree on data model and formats
- Use of data model and formats by industry
- Agree on ISO label
- Use of ISO label by industry
- Local roll out by industry
- Global roll out by industry
Contents

1. Port of Busan Port & Busan Port Authority

2. Main initiatives for the efficiency & coordination

3. Achievement & Challenges
Achievement & challenges

Achievement

Port community
Digitalization & GHG
PCO Projects (BP)

Challenges

Port, under presented
PA, as Landlord
Strong commitment

“Needs to get the cross industries involved in all the initiatives for better coordination at ports”
Thanks

J. SHIN

Busan Port Authority Euro Office

June 11th, 2018

BPA Euro office
P.O. Box 30161
3001 AD, Rotterdam
The Netherlands

Phone: +31 10 261 9930

E-mail: jsshinbpa@gmail.com