INTRODUCTION OF SIPG CONTAINER TERMINAL PRODUCTIVITY

FANG HUAIJIN
VICE PRESIDENT, SIPG
SIPG Witnesses container throughput of 40.233 million TEUs in 2017: Shanghai Port has ranked NO.1 in terms of container throughput ever since 2010.

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CONTAIN THROUGHPUT (M TEU)</th>
<th>YEAR ON YEAR GROWTH↑</th>
<th>INTERNATIONAL TRANSSHIPMENT (M TEU)</th>
<th>YEAR ON YEAR GROWTH↑</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>36.537</td>
<td>3.5%</td>
<td>2.528</td>
<td>1.0%</td>
</tr>
<tr>
<td>2016</td>
<td>37.133</td>
<td>1.6%</td>
<td>2.677</td>
<td>5.9%</td>
</tr>
<tr>
<td>2017</td>
<td>40.233</td>
<td>8.3%</td>
<td>3.087</td>
<td>15.3%</td>
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</tbody>
</table>
Port of Shanghai ranks the top port in terms of berth productivity per 100m.

Yangshan Deepwater Port is taking the lead worldwide in terms of average vessel productivity.

I. PRODUCTIVITY PROFILE

- QUAY LENGTH: 13,025m
- BERTHS: 42
- BERTH PRODUCTIVITY: 309,000 TEUs/HUNDRED METERS
- QC PRODUCTIVITY: 28.9 MOVES/H
- AVERAGE VESSEL PRODUCTIVITY: 98.2 MOVES/H

That in Yangshan Deepwater Port: over 128 MOVES/H

<table>
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<tr>
<th>YEAR</th>
<th>BERTH PRODUCTIVITY (TEU/100M)</th>
<th>YEAR ON YEAR GROWTH↑</th>
<th>QC PRODUCTIVITY (M/H)</th>
<th>AVERAGE VESSEL PRODUCTIVITY (M/H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>281000</td>
<td>3.5%</td>
<td>29.7</td>
<td>90.4</td>
</tr>
<tr>
<td>2016</td>
<td>285000</td>
<td>1.6%</td>
<td>29.9</td>
<td>95.8</td>
</tr>
<tr>
<td>2017</td>
<td>309000</td>
<td>8.3%</td>
<td>28.9</td>
<td>98.2</td>
</tr>
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</table>
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

1. TERMINAL MANAGEMENT ON PAR WITH THE LEADING GLOBAL TERMINALS THROUGH “YEAR OF PRODUCTIVITY & SERVICE PRIORITY” INITIATIVE

- Ensure on-time calling & sailing for vessels
- Speed up transshipment process
- Regulate business process
- Improve handling efficiency
- Provide customized service
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

2. CONTINUOUSLY OPTIMIZE OPERATION & PRODUCTION MANAGEMENT

➢ TRIGGERED BY PLANNING

HQ ➢ TERMINALS

identify production ➔ produce the plan

based on terminal capacity and number of calls

verify the plan ➔ adjust the plan

make sure the plan work
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

2. CONTINUOUSLY OPTIMIZE OPERATION & PRODUCTION MANAGEMENT

➢ SIMULTANEOUSLY DISPATCH MAIN TRADES VESSELS AND FEEDERS

overall management of all the berths;
24 hours berth assigning to link trunk and feeder cargos
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

➢ optimize production organization

analyze machines allocation, site arrangement, operating procedure in advance

verify stacking limits of container terminals, exercise evacuation of ports when over stacking

site, machine maintenance during off-peak time
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

3. COORDINATED DISPATCHING

<table>
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<tr>
<th>Year</th>
<th>QC productivity (move/h)</th>
<th>Berth Throughput (TEU/100m)</th>
</tr>
</thead>
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<tr>
<td>2015</td>
<td>29.7</td>
<td>281 000</td>
</tr>
<tr>
<td>2016</td>
<td>29.9</td>
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</tr>
<tr>
<td>2017</td>
<td>28.9</td>
<td>309 000</td>
</tr>
</tbody>
</table>

- Coordinate the port resources, unified dispatch, adjust ship call plan and operation
- Aggregate adjustment in 2017: 300 ship calls
- Efficiency improvement: 13.8% compared to 2016
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

4. BOOST EFFICIENCY THROUGH TECHNOLOGICAL INNOVATION

➢ Enhance information management in operations

Improve business process standardization based on TOPS 5.0 system
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

4. BOOST EFFICIENCY THROUGH TECHNOLOGICAL INNOVATION

➢ Advance innovation of automated terminal technology

p The largest, most intelligent and automated Yangshan Phase IV;

p To renovated traditional terminals towards automated ones in the future
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

4. BOOST EFFICIENCY THROUGH TECHNOLOGICAL INNOVATION

➢ improve traditional terminal efficiency through technological innovation

Case study: twin-lifting dual handling

Improve utilization of TT and QC by reducing unloaded TT and QC
energy saving: 19.8%
QC productivity: ↑ 49.25%
TT energy saving: 40%
Unloaded TT running rate: ↓ 40%

“双吊具边装边卸”工艺
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

4. BOOST EFFICIENCY THROUGH TECHNOLOGICAL INNOVATION

➢ Encourage all members to engage in technological innovation

- Openly tackle R&D difficulties
- Encourage small innovation
- Advance productive efficiency
- Optimize management
- Advanced operation
- ......
II. SOLUTIONS TO CONTINUOUSLY IMPROVE PRODUCTIVITY

5. WORK JOINTLY WITH SHIPPING LINES TO OPTIMIZE SHIPPING SERVICES & SCHEDULES
III. OUTLOOK

UPSIZING OF CONTAINER SHIPS

MORE SHIPPING LINES M&A AND ALLIANCES

FOSTER FOUR CONCEPTS FOR SHANGHAI PORT

INTELLIGENT, GREEN, HIGH-TECH, EFFICIENT
III. OUTLOOK

To coordinate port resources, improve operation performance

To reasonably assign the berth operations

To balance terminal resources for major trades and feeder services with a focus on boosting the handling efficiency for feeders

To draw upon each other’s strengths and continue to make progress

To leverage the Yangshan Phase IV fully-automated terminal and meanwhile well plan and construct the designated feeder terminal at Yangshan

To further improve the productivity through advanced technology

OPTIMIZE SHIPPING SERVICES & SCHEDULES

STEP UP PLANNING & OPERATIONS

ADDRESS CHALLENGES

PROVIDE QUALITY SERVICE TO FEEDERS

OPTIMIZE PORT RESOURCES ALLOCATION

ENHANCE TECHNOLOGICAL INNOVATION

LEARN THE INDUSTRY BEST PRACTICES

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