A Feasibility Study of Developing 
One-Stop-Service Inland Container Depot: 
A Case Study of Kerry Siam Seaport, Co., Ltd. 

by 

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Abstract 

Kerry Inland Container Depot (ICD) was developed in order to support the importation and exportation of Thailand, in conjunction with the new deep seaport at Kerry Siam Seaport located on the Eastern Seaboard. Being considered as a back up facility to serve the rapidly growing industrial expansion of the Eastern Seaboard, the site for ICD was chosen to be an area near the seaport, approximately 3 kms. Owing to the rapid increase in containerized shipping movements through the seaport, the very considerable expansion of industrial and associated activities on the Eastern Seaboard has placed increasing demands on the use of the ICD. The point has been reached where the size and capacity of the present ICD. This study highlighted: 1) the need for improved access, and proposed a constructed one-stop-service ICD that includes Thai customs department responsible for inspecting agriculture, fisheries, forestry goods, and medicine and 2) the feasibility of the project using the financial instruments Internal Rate of Return (IRR), Net Present Value (NPV), Payback Period (PBP) and Debt Service Coverage Ratio (DSCR). 

Keywords: Inland Container Depot, Seaport, One-Stop-Service, Logistics, Marketing, Finance 

1. Introduction 

There have been tremendously grown of trading among the countries in Southeast Asia. This region is ranked as having the world busiest seaport such as Singapore, compared to other continents. For Thailand, it is recorded as one of the top thirty busiest seaports in the world. In order to serve worldwide customer base and located close to the fast-growing container port of Laem Chabang in Thailand, the Inland Container Depot (ICD) offers a smooth and efficient solution to container consolidation and shipment needs. With the rapid increase in containerized shipping movements through the seaport, the very considerable expansion of industrial and associated activities on the Eastern Seaboard of Thailand has placed increasing demands on the use of the ICD. 

ICD is a common user facility for handling/temporary storage of import/export laden and empty shipping containers. Transhipment of cargo can also take place from such terminals and the Customs clear goods at the ICD. No Customs clearance is required.
at gateway ports thus it increases trade flows and also decongests seaports. At the ICD, the container is unsealed and examined in the presence of the customs examination staff. During examination, a certain percentage of the packages are opened and this percentage is determined by the risk factors that are evaluated by the Custom department on the basis of risk assessment techniques. The importer is required to make the necessary arrangements for the speedy de-stuffing of the cargo in conformance with the examination orders given by the Appraising Groups (Sakhuja, 2005). The concept of the construction of an ICD was developed in order to support the importation and exportation of the country in conjunction with the new deep seaport at Laem Chabang on the Eastern Seaboard.

The benefits of an independent ICD outside are substantial due to an exceeded annual throughout of the port of Laem Chabang that is expanding fast to serve customers around the world. By using ICD, custom procedure can be accommodated inside the ICD. Therefore, Kerry’s ICD was developed to support the importation and exportation of Thailand, in conjunction with the new deep seaport at Kerry Siam Seaport. Kerry ICD offers a unique solution for customers who bring in containers from Laem Chabang port and handle cargoes to high quality service including repairing, cleaning, fumigation, reefer services, and on-site customs clearance, all in top security and a congestion free environment. Kerry ICD is part of Kerry Siam Seaport extensive expansion project. Kerry Siam Seaport located in the Sriracha port and can accommodate up to 6 panamax (or larger) size vessels. It is 7 kilometers from Laem Chabang deep seaport and is well connected by road, and short sea feeding to all parts of Thailand, and neighboring Asian countries. This study highlighted: 1) the need for improved access, and proposed a constructed one-stop-service ICD that includes Thai customs department responsible for inspecting agriculture, fisheries, forestry goods, and medicine and 2) the feasibility of the project using the financial instruments Internal Rate of Return (IRR), Net Present Value (NPV), Payback Period (PBP) and Debt Service Coverage Ratio (DSCR).

2. Literature Survey

Lee and Oum (2001) proposed the strategies for making Korea a Northeast Asian Logistics/Distribution Hub country. After summarizing the recent trends of multinational firms’ logistics and distribution practices and the conditions of successful logistics hubs, we identified the potential advantages of Korea over Japan and China, and examined the success cases of the Netherlands and Singapore. This allowed us to make a number of suggestions to help make Korea attractive to foreign multinationals as the place to locate their northeast Asian regional distribution centers.

Chin and Tongzon (2001) studied transportation Infrastructure Management for Attracting Global and Regional Distribution Centers in Singapore. The success of Singapore as a major transshipment hub must due to the presence of a worldclass transportation system with worldclass players such as SIA and PSA capitalizing on Singapore’s comparative advantage in location, which began with the development of the port followed by air and land. The land, sea and air sectors have taken an independent approach to development and investment in the past. Multi-modalism in the cargo industry demands instant acquisition, processing and analysis of data,
thereby logistics is that vital link to enhancing production, distribution and consumption.

State Railway of Thailand (SRT) (2003) stated that it engaged the Consultant in 2000 - 2001 to undertake the study to identify improvements to the rail layout in both the internal and external yards and the operation of the Lad-Krabang rail terminal that will improve the rail capacity of LICD to meet foreseen needs and to develop detailed plans for SRT to implement their solution in each phase of the development. The study concludes that to increase train movements there must be infrastructure improvements for access and the yard components. However, for the ICD railhead component the increase in train movements can be achieved by operational improvements to reduce the loading / unloading time of trains. It is, therefore, not necessary to improve the existing railway infrastructure in LICD. The project cost is estimated at 138.76 million Baht. The capacity shall be increased to 1,000,000 TEU per annum. The Government has allocated budget for this Project. Presently, the improvement of access and yard together with the extension of siding track length and additional turnouts at Don Si Non, Sriracha and Laem Chabang Station were completed. In addition, stabling yard is under the process of land acquisition. It is expected to start construction in September 2003 and be completed in 2004.

Sakhuja (2005) mentioned that the Shipping Ministry’s proposal for a dedicated railway freight corridor between the ICD, Tughlakabad, Delhi and the Jawaharlal Nehru Port Trust (JNPT) Mumbai was aimed at providing an impetus to container movement between the two terminals. The proposal comes in the wake of rapidly increasing demand from the exporters in northern India. Besides, the ICD Tughlakabad-JNPT corridor is currently facing severe capacity constraints with wagon deployment touching 140 per cent and which may go as high as 180 per cent in next few years. However, ICD Tughlakabad is the weak link in the container transportation system in the country. All commodities were being imported through ICD, major items being machinery, electronic goods, plastic, chemicals, motor vehicles and parts and metal and metal scrap. On export side major items being exported through ICD were leather garments and leather products, readymade garments, machinery, agricultural products especially rice.

3. Research Methodology

The research study collected data through an in-depth interview and focus group as primary data. For secondary data collection, it was done by the use of documentation from ICD at Lad Krabang as an example as well as from Kerry ICD and Kerry Siam Seaport. This study identified a constructed one-stop-service ICD by collecting data of flow process chart, time study, systematic layout planning, marketing study, and financial study. The financial instruments used in the study included IRR, NPV, PBP, and DSCR.
4. Results

4.1 ICD Lad Krabang, Bangkok, Thailand

In order to constructing a detailed study plan of one-stop-services, the ICD at Lad Krabang (LICD) was used as an exemplary case study due to its first Thai ICD development. An example of ICD the site for ICD was chosen to be an area near the Lad Krabang Industrial Estate, approximately 30 kilometers east of Bangkok. The construction of LICD was completed in 1995. It was divided to 6 independent modules leased out to private sector operators but the facility is managed by SRT. Owing to the rapid increase in containerized shipping movements through the port of Laem Chabang, the very considerable expansion of industrial and associated activities on the Eastern Seaboard has placed increasing demands on the use of the LICD. The point has been reached where the size and capacity of the present LICD will shortly be exceeded by traffic demand particularly when the Track Doubling Project in the eastern line was completed in 2003.

Table 1 ICD Lad Krabang Concession Fee in Year 2007

<table>
<thead>
<tr>
<th>Station</th>
<th>Shipper</th>
<th>Concession Fee (USD)</th>
<th>Revenue from Concession Fee (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Siam Shore Side Service Co., Ltd.</td>
<td>80,300</td>
<td>12,758,064</td>
</tr>
<tr>
<td>B</td>
<td>Eastern Sea Laem Chabang Terminal</td>
<td>59,558.82</td>
<td>9,462,705.88</td>
</tr>
<tr>
<td>C</td>
<td>Evergreen Container Terminal (Thailand) Co., Ltd.</td>
<td>104,705.88</td>
<td>16,635,670.59</td>
</tr>
<tr>
<td>D</td>
<td>Tiffà ICD Co., Ltd.</td>
<td>66,176.47</td>
<td>8,621,470.58</td>
</tr>
<tr>
<td>E</td>
<td>Thai Hanjin Logistics Co., Ltd</td>
<td>93,529.41</td>
<td>12,185,011.76</td>
</tr>
<tr>
<td>F</td>
<td>NYK Distribution Service (Thailand) Co., Ltd.</td>
<td>72,841.17</td>
<td>11,573,006.12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>477,111.75</strong></td>
<td><strong>71,235,928.93</strong></td>
</tr>
</tbody>
</table>

Note: 1 USD = 34 Baht Exchange Rate

For its layout, Figure 1 illustrated an existing layout of ICD with one-stop-service operation. A central office located at the upper right corner of the picture comprises of: State Railway of Thailand (SRT) office, customs department, agricultural control point, wild animal control point, fisheries control point, animal quarantine international control point, forestry goods control point, and medicine control point.
Figure 1 Layout of One-Stop-Services Inland Container Depot at Lad Krabang

4.2 ICD Kerry Siam Seaport, Sriracha, Chonburi, Thailand

ICD at Kerry Siam Seaport should provide a full facility service such as:

- 24 hours and 7 days operation and being fully equipped with customs clearance on-site
- 100 reefer points for refrigerated container
- 16,000 square meter of container freight station (CFS) warehouse
- Certified fumigation yard
- State-of-the-art information technology infrastructure such as online electronic data interchange customs clearance or NAVIS terminal management software
- Nationwide transportation and distribution services
- One-stop-service and value added services
- High security and surveillance systems
- Congestion free environment

For the primary functions of an ICD, they may be summed up as under receipt and dispatch/delivery of cargo, stuffing and stripping of containers, transit operations by rail/road to and from serving ports, customs clearance, consolidation and desegregation of LCL cargo, temporary storage of cargo and containers, reworking of containers, and maintenance and repair of container units.
The operations of the ICDs revolve around the following centers of activity:

1. Container Yard
   Container yard occupies the largest area in the ICD. It is stacking area were the export containers are aggregated prior to dispatch to port; import containers are stored till Customs clearance and where empties await onward movement. Likewise, some stacking areas are earmarked for keeping special containers such as refrigerated, hazardous, overweight/over-length, etc.

2. Warehouse
   A covered space/shed where export cargo is received and import cargo stored/delivered; containers are stuffed/stripped or reworked; Less than Container Load (LCL) exports are consolidated and import LCLs are unpacked; and cargo is physically examined by Customs. Export and import consignments are generally handled either at separate areas in a warehouse or in different nominated warehouses/sheds.

3. Gate Complex
   The gate complex regulates the entry and exists of road vehicles carrying cargo and containers through the terminal. It is place where documentation, security and container inspection procedures are undertaken. In order to developing a layout of ICD at Kerry Siam Seaport, it is necessary to prepare a Flow Process Chart. A flow process chart can help to analyze the work flow of ICD. The heading of the chart indicates what aspect of the operation and where the process begins and ends illustrated in Figure 2.

   ![Flow Process Chart](Image)

   **Figure 2** Flow Process Chart of ICD at Kerry Siam Seaport
### Table 2 Summary of ICD Activities with Flow Process Chart and Time Study

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Symbol</th>
<th>Activity</th>
<th>Distance (Meter)</th>
<th>Time (Minute)</th>
<th>Worker</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container</td>
<td>1</td>
<td></td>
<td>1. Transferring a container to container yard</td>
<td>3500</td>
<td>1</td>
<td>2</td>
<td>Per 1 TEU</td>
</tr>
<tr>
<td>Container</td>
<td>1</td>
<td></td>
<td>2. Customs procedure</td>
<td>8000</td>
<td>1</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>1</td>
<td></td>
<td>3. Transferring a container to CFS and open it</td>
<td>15-20</td>
<td>2</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>1</td>
<td></td>
<td>4. Storing goods in a warehouse</td>
<td>2.3-3</td>
<td>2</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>1</td>
<td></td>
<td>5. Discharging goods from a warehouse</td>
<td></td>
<td>2</td>
<td>Using Fork Lift</td>
<td></td>
</tr>
<tr>
<td>Container</td>
<td>1</td>
<td></td>
<td>6. Shipper transfers a container to destination</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

The design and layout should be the modern state-of-art equipped with mechanical/electrical facilities of international standards. Key to a good lay-out is the smooth flow of containers, cargo and vehicles through the ICD. The design and layout should take into account initial volume of business. The design broadly should encompass features like container yard, gate house and security features, boundary wall (fencing), roads, pavements, office building and public amenities. Once the flow process chart and time study were identified, the evaluation of layout was involved. The layout design has a significant impact on the performance of the ICD. Within layout planning, a block diagram of the above features were considered, in accompany with customs department, agricultural control point, wild animal control point, fisheries control point, animal quarantine international control point, forestry goods control point, and medicine control point located at the central office nearby the gate house (on the upper left corner) illustrated in Figure 3.
After considering the design and layout planning, the study also discussed several obvious reasons why should finance be studied. Using the costs listed in Appendix A together with the financial assumptions, the financial model was created using the financial instruments to access the feasibility of the ICD project.

- **Internal Rate of Return (IRR)**
  
  Using the data and assumptions, a cash flow statement was crafted in appendix A. Using the formula of IRR given by Gitman (2006):

  \[
  0 = \sum_{t=1}^{n} \frac{CF_{pre-tax}}{(1 + IRR)^t} - C_0
  \]

  **Project IRR (Pre-Tax)**

  \[
  0 = \sum_{t=1}^{23} \frac{CF_{pre-tax}}{(1 + IRR)^t} - \text{Total Investment Cost}
  \]

  Where: \( CF_{pre-tax} \) is the Net cash flow of the project before interest, debt service and taxes

  **Project IRR (Post-Tax)**

  \[
  0 = \sum_{t=1}^{23} \frac{CF_{post-tax}}{(1 + IRR)^t} - \text{Total Investment Cost}
  \]

  Where: \( CF_{post-tax} \) is the net cash flow of the project after corporate tax.
Equity IRR (Free-Cash)

\[
0 = \sum_{t=1}^{23} \frac{CF_{\text{post-tax}}}{(1 + IRR)^{t}} - \text{Share holders capital}
\]

Where: \(CF_{\text{post-tax}}\) is the net cash flow after corporate tax and debt service.

- **Net Present Value (NPV)**
  Using the data and assumptions, a cash flow statement was crafted in appendix A. Using the formula of NPV given by Gitman (Gitman, 2006):

\[
\text{NPV of Dividends} = \sum_{t=1}^{23} \frac{CF_{\text{dividends payment}}}{(1 + 6.875\%)^{t}} - \text{Share Holders Capital}
\]

Where: \(CF_{\text{dividends payments}}\) is the net cash flow of dividend payments each year

- **Payback Period (PB)**
  The payback period is the amount of time required for the firm to recover its initial investment in the project, as calculated from cash inflows.

- **Debt Coverage Service Ratio**

\[
\text{DSCR} = \frac{\text{Gross Operating Profit}}{\text{Total Debt Service}}
\]

The project IRR is 28.56 %. Based on the theory, when IRR is greater than the cost of capital, the project is accepted (Gitman, 2006). The investor’s cost of capital is 18 %, therefore the criteria is satisfied. NPV of dividend at 19.27 % is USD 294,438,604 which is greater than 0. Based on the theory on NPV (Eun, et al, 2004), the project passes the criteria. The project has a payback period of 8 years. The maximum acceptable payback of the project, according to the investors is 10 years therefore the project is acceptable. The minimum debt service coverage ratio (DSCR) is 2.12. Based on the theory from Investopedia (Investopedia, 2008), DSCR above 1 is acceptable.

Based on these financial indicators, the project has excellent financial returns with enough margins for any unforeseen downside; therefore the project is feasible and acceptable.

**Conclusion and Recommendation**

In summary, the use of an ICD offers a unique service which can help overseas customers who bring in containers. The ICD at Kerry Siam Seaport offers solution including packing and re-packing, LCL consolidation, container storage, repair, cleaning, fumigation, on-site customs clearance, and other customs services by the use of all control points. It should be noted that the ICD at Lad Krabang can be used as an exemplary case study of Kerry Siam Seaport due to its first Thai ICD development. Based on the analysis results, it indicated that the ICD project at Kerry Siam Seaport is rather potential considering the financial indicators. It is also recommended that the benefits as envisaged from the ICD are as follows:
- Concentration points for long distance cargoes and its unitization.
- Service as a transit facility.
- Customs clearance facility available near the centers of production and consumption
- Reduced level of demurrage and pilferage.
- No Customs required at gateway ports.
- Issuance of through bill of lading by shipping lines, hereby resuming full liability of shipments.
- Reduced overall level of empty container movement.
- Competitive transport cost.
- Reduced inventory cost.
- Increased trade flows.

Therefore, expanding the ICD around Thailand’s Eastern Seaboard may lead to more profitability because Laem Chabang deep sea port has reached its maximum capacity. The ICD at Kerry Siam seaport is thought to be the only ICD in Laem Chabang port area. By including the other services from the customs department (i.e., customs department, agricultural control point, wild animal control point, fisheries control point, animal quarantine international control point, forestry goods control point, and medicine control point) provides Kerry Siam Seaport better performance of the ICD operations. The reason behind is that one-stop logistics services operating with the above control points are provided only at Laem Chabang seaport; thereby time can be lessen due to the use of its one-stop services at site.

References


**Appendix A: Cash Flow Statement**

**Associated Corporations**

<table>
<thead>
<tr>
<th>Name of Associated Corporation</th>
<th>Name of Director</th>
<th>Number of ordinary shares</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Personal Interests¹</td>
</tr>
<tr>
<td>Kory Group Limited</td>
<td>Mr. KUOK Khoon Chen</td>
<td>7,651,761</td>
</tr>
<tr>
<td></td>
<td>Mr. WONG Siu Kong</td>
<td>4,617,283</td>
</tr>
<tr>
<td></td>
<td>Mr. HO Shu Kim</td>
<td>1,388,462</td>
</tr>
<tr>
<td></td>
<td>Mr. MA Wing Kai, William</td>
<td>1,010,626</td>
</tr>
<tr>
<td></td>
<td>Mr. CHAN Wei Ming, William</td>
<td>100,000</td>
</tr>
<tr>
<td></td>
<td>Mr. GAN Shek Hua</td>
<td>550,000</td>
</tr>
<tr>
<td></td>
<td>Mr. TSE Kai On</td>
<td>650,000</td>
</tr>
<tr>
<td>Kory Siam Seaport Limited</td>
<td>Mr. MA Wing Kai, William</td>
<td>1</td>
</tr>
<tr>
<td>SOMP Group Limited</td>
<td>Mr. KUOK Khoon Chen</td>
<td>4,000</td>
</tr>
<tr>
<td>Shang Properties, Inc.</td>
<td>Mr. HO Shu Kim</td>
<td>1,670</td>
</tr>
</tbody>
</table>

**Principle Subsidiary**

<table>
<thead>
<tr>
<th>Name</th>
<th>Place of Incorporation/ establishment</th>
<th>Principal activities</th>
<th>Issued share capital/ Registered capital</th>
<th>Number/ Amount</th>
<th>Par value per share</th>
<th>Indirect interest held unless denoted with*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics Network Division (Continued)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kory Siam Seaport Limited</td>
<td>Thailand</td>
<td>Operating deep-sea wharf and warehouses</td>
<td>65,000,000</td>
<td>Bht10</td>
<td>67.98%</td>
<td></td>
</tr>
</tbody>
</table>