Parsons

Port Newark Container Terminal

Wharf Rehabilitation and Improvement Project

Buy America Waiver Assessment – Ship to Shore Container Gantry Cranes
8 April 2016

Introduction

Port Newark Container Terminal (PNCT) is currently engaged in a facility expansion project with the intention to double their current operational terminal throughput capacity. Included in this project is a newly designed and expanded yard, structural improvements to the wharf, berth dredging, and the procurement of larger cranes to accommodate the demands of their customer's largest vessels. The purchase of these cranes will increase the operational capacity of the facility by 240,000 container lifts per annum.

In an effort to accelerate this expansion plan, PNCT has applied for financing through the Transportation Infrastructure Finance and Innovation Act (TIFIA) program. In adherence with the program requirements, PNCT will comply with all sections of the Buy America Act, and purchase products and materials from US manufactures as possible. To verify the potential to source the Ship to Shore Container Gantry Cranes (STS cranes) scoped in the TIFIA application, PNCT has engaged Parsons Transportation Group to provide a third party opinion on the availability of American manufactured STS cranes.

The STS Cranes specified in the TIFIA application are required for two reasons, in which the first is to be able to provide additional container throughput handling capacity at PNCT; and the second is to provide an enhanced capability to service the Ultra Large Container Vessels (ULCV) expected to call PNCT once the Bayonne Bridge has been raised. These STS cranes will be unique in that they will be designed to handle the ULCV vessels, as well as being designed with a low profile due to PNCT's proximity to Newark Liberty Airport.

As has been reported by the major shipping lines, it is their plan to deploy their larger (ULCV) vessels on the transatlantic and transpacific trades direct to the US East Coast upon the opening of the expanded Panama Canal and the raising of the Bayonne Bridge. This strategic change is being done in order to provide improved economic and environmental efficiency in servicing the largest US markets.

The greatest single operational activity that has the largest impact for the Ports and Marine Terminal Industry, is the use of these much larger vessels to reduce the operating cost per

container slot in the transport of commercial goods across our world's oceans. Port Newark Container Terminal is improving its facility in order to maintain and improve the competitiveness of the New York – New Jersey port complex.

Outside of the actual marine terminal infrastructure asset, there is no greater single purchase in a marine terminal than that of the ship to shore container gantry crane.

Procurement

Although many terminal operating companies have considered alternative purchasing theories for their major equipment, such as using the Total Cost of Ownership model, in the end, the initial capital expense is often the primary driver for these decisions. As such the terminal operator seeks to get the lowest cost after a technical evaluation of rival manufacturer's designs during the procurement exercise.

The manufacturers that are typically competing in such an exercise are ZPMC, Cargotec, Kone, Liebherr, and others, with the large majority of the manufacturing occurring in China.

Manufacturing and delivery

The container handling equipment manufacturing market has become very specialized. Today's ship to shore container gantry cranes are a series of components assembled in the manufacturer's yards, where the primary structural frame is designed and built. Many of the individual components, including the electronics, the control drive systems, motors, wire ropes, cabling and brakes are typically shipped in from facilities around the world, and then assembled at the crane manufacturer's facility.

In the years prior to 1990, crane manufacturing occurred in multi-purpose industrial yards around the world, including the USA, that provided a host of steel manufactured goods, operating with local labor, close to their market. Today the STS manufacturing market is centered in specialized facilities. As an example, ZPMC operates a manufacturing facility, located on an island solely dedicated to the manufacture of container handling equipment, which allows ZPMC to keep construction, assembly and inventory costs at the lowest levels.

As with the invention and constant innovation in the construction and operation of container vessels, replacing the previous standard method of shipping goods by general cargo vessels that moved goods across the oceans for centuries, the delivery methods and shipment of container cranes also saw innovation in the late 1980's. The new innovation of shipping fully erected cranes to port locations around the world, wherever possible, replaced the previous method of shipping the individual components to the port facilities, and assembling on site.

This new process eliminated the disruption and space requirements in the port facilities for assembly with this new delivery method. As result there were direct and indirect cost savings to the operators in the procurement of these new cranes. This new delivery method proved to be the final process element that ended the USA ship to shore container gantry crane industry. With today's cranes being more than three times heavier, and with key components almost two times larger than the original cranes to deal with the ever increasing size of vessels, the cost and logistics involved in the older style delivery method is prohibitive.

The last operating facility in the USA was the CEMCO crane manufacturing facility in Gulfport, Mississippi, which produced their last units in 1989. This facility, which was upriver of a low air draft bridge, could no longer be competitive with the new fully erected delivery methods, and as a result, its parent company Paceco moved its manufacturing yard outside of the USA. Construction of a new specialized STS Crane manufacturing facility in the US would most likely be financially unviable.

Design Cost Advantages

In today's container crane market, there should be no expectation in a revival of this business returning to the USA. The average time to construct a container crane is 16 – 22 months, depending on the manufacturer and design specifications. The newest cranes which will service the ULCV vessels due to call the US East Coast, will weigh in excess of 1,200 tons, and the following reported items would conclude that the USA will not see a return of this industry in the near future:

a. The cost advantage of Asian structural steel compared to USA structural steel, as reported by MPS International Steel Price Index in December 2015 is approximately 26%.
b. In a study by Richard Bernstein Advisors LLC, in cooperation with US Bureau of Labor Statistics, the National Bureau of Statistics of China, and Bloomberg, reviewing the rise in industrial labor salaries from 2007 – 2012, China labor saw an annual increase in their salary of approximately 16% more than that of USA labor, but as reported in Huff Business in March 2012, University of Michigan's Bonnie Kavoussi reported that the cost advantage in China over the USA in industrial labor still showed a tenfold advantage to China.
c. With China's largest STS crane manufacturer claiming a container crane market share in excess of 70%, the cost barrier to entry into this market for any new manufacturer would be very high. One of the reasons for this point is that the design service lifetime of these cranes is 30 years, and the structure is designed for 50 years, and many port facilities have already replaced their original units from the 1970's and 1980's in the last 10 years. In addition, the manufacture of the new units for the largest vessels afloat are

already delivered or in production. Thereby it can be concluded that there is not the ability for a US manufacturer to enter into this cost competitive business without a major innovation in design that would enhance cost leadership or safe productivity of the port facility. No such innovation has been reported in recent times.

Summary

With the exit of the last USA manufacturer of ship to shore container gantry cranes, CEMCO, in 1989, there has been a steady evolution of the industry as a result of the needs of the customer base. Vessels have grown to reach carrying capacities almost five times higher than in 1989, and crane capacity, productivity and size have grown in a similar manner. Along this path of evolution, new cost savings measures have been introduced. These include the delivery of fully erected cranes, supply chain optimization, the global sourcing of components and raw materials which along with low labor prices has seen the market in Asia, and in particular China, grow to such a level that entry into this market in the USA would be difficult, and will not be seen in the near term.

As a result, Port Newark Container Terminal will not be able to source their new ship to shore container gantry cranes in the USA.

Submitted,

Rex C. Gundle

Program Director

Parsons Transportation Group

Mr. Rex C. Gundle is a Program Director for Parsons Transportation Group, and is a United States Merchant Marine Academy Graduate and former US Naval Officer. He is a 27 year veteran of waterfront operations and is considered a safety advocate and operational expert in container terminal operations. His reputation among shipping lines, logistics organizations, and trucking firms is that of an individual who understands the industry well and works closely with customers and stakeholders in achieving their business objectives.

In his career, Mr. Gundle has worked in regional executive roles for APM Terminals, as well as managed green field startups, joint venture organizations, marine terminal operations and container terminal construction projects. Whether as a senior leader at a site-specific location, as a consultant, or as a business auditor, Mr. Gundle has been credited with cutting costs of operations by up to 40 percent while improving quayside performance by 50 – 80 percent using Lean Six Sigma techniques, procedural equipment reviews as well as reconfiguring facility layouts to achieve this success.