

TTI Algeciras: pioneer in transshipment automation



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During the last 25 years, transshipment has progressively grown and gained importance in an international context due to the development of a highly competitive environment. It has become an essential tool for any shipping company that intends to explore new markets and expand their business globally.

Likewise, the need to remain competitive is imposing the use of larger capacity vessels that have the tendency to call at fewer ports in order to lower transport costs and offer better conditions to increasingly demanding customers. This trend of gigantism is mainly seen in the East-West trades and specifically between Asia and Europe, most of which cross the Strait of Gibraltar, where the Spanish Port of Algeciras is located.

Thanks to an extraordinary combination of location and infrastructure, Algeciras is internationally recognised as a strategic place for hub-and-spoke and relay transshipment; allowing the connection between the main centres of production and emerging markets with growing consumer capacity.

The reliability of this connectivity is the main competitive advantage of TTI Algeciras, and this operational excellence is achieved thanks to the architecture of the terminal, a dedicated team of professionals and the introduction of automation in the terminal operations.

Infrastructure

TTI Algeciras was constructed in a greenfield site with 24-hour easy sea access (the Port of Algeciras is a natural deep-water bay opened to the Strait of Gibraltar) with no draft restrictions, which are two of the essentials for the transshipment trade.

Planned to be a 'common user' container

terminal, TTI Algeciras was designed to match the needs of all companies. Its vertical layout and ship-to-shore cranes capable of handling container vessels with 24 containers wide on deck, have been indispensable in developing docks with the capacity and productivity demanded by transshipment traffic.

Automation

In 2010 the terminal became a pioneer in the introduction of automation in terminal operations in southern Europe and the Mediterranean. The objectives pursued were the improvement of productivity and the reduction of costs that would allow the terminal to fit the requirements of carriers deploying mega-ships in the Asia-Europe trades and to compete in an environment with labour costs lower than in Europe.

Innovative processes control the container yard and the gate (where human intervention has been eliminated) and are also present in the horizontal transportation of containers made by shuttle carriers and the loading and discharge operations in the quay.

The fully automated yard is controlled by a tailor-made TOS which is assisted by different functions such as yard allocation, auto house-keeping and the efficient assignment of shuttle carriers to containers. Containers are stacked in sixteen blocks perpendicular to the main quay with two last generation ASCs operating in each block (one on the seaside and the other one on the landside). The ASC on the seaside is mainly working against the quay and is supported by the ASC on the landside to boost productivity.

The whole yard is fenced preventing the entrance of workers except those authorised to do repairs or preventive maintenance of the cranes. Besides the

clear increase of safety within the facility, there are also benefits for the cargo in the sense that any incidence such as non-authorised manipulation of containers has been 100% eliminated.

The TOS solution also manages all tasks related to the operations such as vessel planning, berthing and gate in real-time, while also providing management tools such as billing, reporting, gang nomination, EDI communication and e-Service, a platform of interaction among the terminal, carriers, forwarders and transport companies.

The terminal operations are designed in such way that the container is always dropped and picked up from the ground, which eliminates waiting times during the interchange of the container between the different equipments and the need of remote control of the ASC (for the last move). It also facilitates the segregation of internal traffic (shuttle carriers) and the external vehicles (trucks). The result is a well balanced workflow between the yard and the horizontal transfer of the container and the quay.

One of the main challenges for us is to achieve 100% container traceability to guarantee that the container entering the yard is the correct one. This is possible thanks to a full integration and communication among different systems that provide automated process control such as OCR (optical character recognition), LPR (license plate recognition), RTLS (real-time locating system) and DGPS (differential ground positioning system).

While discharging a container from a vessel, the container traceability is guaranteed in three steps:

- The OCR installed on the elevated lashing platform of a quay crane



takes hundreds of pictures in a few seconds with a very high accuracy, recognising the container number among other characteristics of the container

- Next the system makes a cross-check among the container number, the backreach lane of the quay crane and the shuttle carrier number assigned to pick up the unit. The terminal knows the position of the quay crane, the slot in the backreach where the container has been dropped and the shuttle carrier position thanks to the RTLS and the DGPS integrated on the shuttle carrier. The system only allows the assigned shuttle carrier to pick up the container in the correct position. Otherwise, twistlocks are blocked
- Before the container enters the yard, a final cross-check is done among shuttle carrier number, yard transfer area number and slot number. Similar verification procedures are followed for container loading and gate/rail operations

Human intervention

The semi-automation implemented by TTI Algeciras allowed the achievement of both streamlining operational costs and increasing productivity. One side mixes the savings and reliability of automation with the flexibility of human beings, securing minimum turnaround time of ocean vessels.

The control of operations is done by the terminal personnel. The operations and IT Teams monitor and trace the status and performance of systems in real-time in order to find and attend in advance to any incidence or bottleneck; ensuring that everything works with the required functionality level.

Beyond transshipment

Since 2010, the terminal has successfully managed to diversify its customer portfolio, bringing together more than twenty five shipping lines operating with regular services. Today TTI Algeciras

is directly connected to more than 100 ports all around the globe and is constantly challenged on the operation of the 18,000 TEU vessels coming in every week from the Far East. Shipping lines and terminals work together to mitigate disruptions on the network (berth on arrival) and to reduce the port stay by deploying the maximum number of cranes within the highest safety environment.

The hinterland of Algeciras includes a local market of twelve million consumers and has more than 500 exporting companies seeking the best logistical solution to position their products. TTI Algeciras has also been able to enhance

logistical solutions that incorporate the train in the supply chain; transforming Algeciras into an alternative gateway port for the big centres of consumption and production located in the centre of the Iberian Peninsula.

Thus, in addition to being a strategic place for transshipment, the access to import and export cargo is adding significant value to TTI Algeciras. The location helps to shorten the transit time of containers connecting Asia, Europe, America and Africa. Algeciras is actually the first port of call in the Mediterranean for many of these trades, allowing a considerable reduction of time between origin and final destination.

About the author

Ms Maribel Grau is the Commercial Manager of TTI Algeciras. She joined the project in April, 2008 right after the bid was awarded to Hanjin Shipping. Prior to joining TTI Algeciras, Maribel worked for four years in Beijing and Hong Kong as a Market Analyst and Trade Advisor in different institutions such as the BBVA bank and the Economic and Trade Offices of the Consulate General of Spain and the Delegation of the European Union to China.

About the organisation



Total Terminal International Algeciras is the company promoted by the South Korean corporation Hanjin Shipping to build and run the Port of Algeciras Bay's second container terminal. The concession, awarded in July 2008, is located on the Phase A plot of the Isla Verde Exterior expansion area. The terminal is settled in 35 hectares with a capacity for 1.8 million TEU and two quay lines of 850 metres on the east and 550 metres on the north, with draughts of 18.5 and 17.5 metres, respectively. TTI Algeciras was the first semi-automated container terminal in the Mediterranean initiating business activity on May, 2010 with 8 quay cranes, 32 ASC and 22 Shuttle Carriers.

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