



GOAL

- Build a fully automated container terminal with low cost, short implementation time, high productivity levels, superior intelligence levels, safer operational environment and zero emissions
- Following completion of phase one construction, continue to innovate and raise the bar for modern terminal operations in the region and on a global scale
- Transition from two to six fully automated berths to support a future capacity of 5.2 million TEUs and an average quay crane productivity of 40 container moves per hour

SOLUTION

- Navis N4 TOS

RESULTS AT-A-GLANCE

- Achieved a world record 43.23 containers moves per hour after unloading 1,992 containers on December 31, 2019
- When compared to manual container terminals, QQCTN has 70 percent less labor costs and yet achieves 30 percent more productivity. Its automated container handling equipment is electric and unmanned, helping the terminal achieve higher safety standards, zero emissions and no lighting required at night in its yard operation
- By November 2018 the terminal had more than 1,100 vessel calls with 100% on-schedule performance
- Averages a 13 minute truck turnaround time, as opposed to a manual terminal typically averaging ~30 minutes

Qingdao New Qianwan Terminal (QQCTN) – Breaking Records Through Innovation and Technology

CUSTOMER PROFILE:

- Qingdao New Qianwan Terminal (QQCTN) is the first automated container terminal in Asia and one of the most advanced automated container terminals worldwide.
- QQCTN is operated by Port of Qingdao, an important hub for international trade and transportation in the West Pacific region, maintaining shipping routes to over 700 ports in over 180 countries and regions around the world.
- QQCTN completed phase one of construction in 2017 in a record-breaking 3.5 years and is currently operating with an annual throughput of 1.5 million TEUs.

ABOUT QQCTN:

Qingdao New Qianwan Terminal (QQCTN) is located at the south bank of Qianwan Port Area, Qingdao, Shandong Province, China and is operated by the Port of Qingdao. Established in November of 2013, the Port of Qingdao covers four port areas: the Dagang Port Area, the Huangdao Oil Port Area, the Dongjiakou Port Area and the Qianwan Port Area, where QQCTN is located. In 2015, QQCTN kicked off the first of a three-phase automation project that will eventually automate a total of six berths at the port. The first phase was completed in a record-breaking 3.5 years and by May of 2017, QQCTN successfully handled its first deep-sea vessel.

THE TOS BEHIND THE OPERATION

With a focus on streamlined operations and increased efficiency, QQCTN partnered with Navis whose N4 TOS would serve as the brains behind the terminal complex – integrating software and equipment to ensure the terminal functions smoothly. The terminal went live with N4 in May 2017 to support its first two automated berths with a capacity of 1.5 million TEUs and is currently expanding the engagement to incorporate its remaining four terminals with a future capacity of 5.2 million TEU and sustained average quay crane moves of 40 per hour. QQCTN leverages N4's advanced functionality for automated equipment, including optimized scheduling and dispatching and analytics. Navis also supports dynamic interfaces to the Equipment Control System (ECS) and QQCTN's in house terminal management system.

QQCTN: SETTING THE STANDARD FOR AUTOMATED TERMINALS

Today, QQCTN is the first automated terminal in Asia and since its first successful vessel call, has seen significant momentum and results with the help of Navis's software. Now in phase two of three, QQCTN has already completed more than 1,100 vessel calls with 100% on-schedule performance. With equipment that is electric and unmanned, the terminal saves 70 percent over manual terminals on labor costs yet increases its productivity by 30 percent as it maintains 24/7 operations including yard operations at night without the need for lighting. The automated technology at QQCTN has also helped the terminal achieve its additional goals for the project including higher safety levels as well as zero emissions.

The benefits are also being passed along to QQCTN's customers with significantly reduced dwell times. Typically, QQCTN averages 33 container moves per hour compared to an average 21 moves per hour at a manual terminal, but has achieved higher levels on multiple occasions, such as with COSCO Greece S.A., where it successfully unloaded 42.9 containers per hour. On December 31, 2018, QQCTN broke a world record for average single machine efficiency while unloading the Santos Express. QQCTN unloaded 1,992 containers at a record-setting pace of 43.23 container moves per hour and averaged a 13 minute truck turnaround time. Today, QC productivity in QQCTN is 20% more than other manual terminals. For the first 2 berths, 9 remote operators can do the work of 60-80 operators.

"We immediately aligned with Navis' vision for the future of innovation in the ocean shipping industry and with its experience helping terminals around the world achieve their goals for automation, we knew we made the right choice in selecting N4 for our TOS. Once we started, the Navis team helped us automate our terminal in record time," said Zhang Liangang, General Manager, QQCTN. "Through our partnership with Navis, we are confident we will raise the bar for modern terminal operations, performance and efficiency across the ocean supply chain."

As an automated terminal and industry leader, QQCTN has gone beyond just automating operations. It has spent a lot of time on operation optimization and technology innovation – addressing several longstanding challenges in the industry for the first time. QQCTN has set the industry standards by introducing new technologies such as AGV recharging during operations, eliminating the huge cost associated with building the battery exchange stations and time wasted when AGVs are not servicing operations. Additionally, QQCTN introduced a one button anchoring system ensuring that all Automatic Stacking Cranes are anchored within two minutes in case of high wind. Other innovative technology in use is the twist-lock handling robots and asymmetric back-reach, double trolley Quay Crane. These innovations are part of the terminal's "Intelligent Production Management and Control Systems" which is based on the information systems and equipment data that is available. This system ensures that operations are productive, reliable, economic and eco-friendly.

QQCTN is setting the standard for building and operating a fully automated and eco-friendly container terminal globally. As a terminal that is pioneering this innovation in its region, QQCTN is slated to accomplish its goals with the help of smart technologies like Navis through the remaining phases of the automation project and will lead the industry to automation by its example.



WWW.NAVIS.COM
55 HARRISON STREET, STE. 600, OAKLAND, CA 94607, USA

Navis is a provider of operational technologies and services that unlock greater performance and efficiency for the world's leading terminal operators and ocean carriers. Navis combines industry best practices with innovative technology and world-class services to enable our customers to maximize performance and reduce risk. Whether tracking cargo through a port, automating equipment operations, or managing multiple terminals through an integrated, centralized solution, Navis provides a holistic approach to operational optimization, providing customers with improved visibility, velocity and measurable business results.