



DISRUPTIVE INNOVATION FOR CONTAINER TERMINALS BECOMES REALITY



THE FIRST BOXBAY HIGH BAY STORE FOR CONTAINERS
IN DUBAI IS ALREADY IN ITS COMMISSIONING PHASE

The realisation of the first section of a high bay storing system at DP World in Dubai, based on the innovative BOXBAY technology, is progressing rapidly. Thanks to the highly ambiguous efforts of the joint construction and commissioning team the container handling system is already in place on the area of Jebel Ali Terminal 4. When in regular operation the containers will not have to be stacked on top of each other, as has always been the case in terminal industry, but rather will be stored 11 stories high in a rack system of the high bay store in order to save space. Storing of containers in individual rack compartments provides direct access and increases performance.

High Bay Stores (HBS) has long been common in distribution logistics and industrial production. Now, this technology has been successfully transferred to container terminal operations. The advantage: more than

three times the capacity of conventional yard systems, and so, the footprint of terminals can be reduced by up to 70%. An HBS enables any container to be accessed individually without moving any other. The annoying shuffling is eliminated. Only productive and thus paid moves are performed.

Less than one year ago, the excavation works for the foundation was started and now the engineers of BOXBAY, the new joint venture between DP World and the German large scale plant manufacturer SMS group, have already started the commissioning of the fully automated plant. For port operators the speed of implementation appears surprisingly fast, especially considering that it is the first container high bay store worldwide and thus a disruptive innovation. However, it becomes understandable when one realises that the SMS group subsidiary AMOVA, the technical leader in this field, has already

supplied almost 80 similarly sized heavy load high bay storage systems in the last decades. Not for containers but for applications in other markets, mostly for heavy coils in the metal processing and steel producing industries. AMOVA's parent company, the SMS group, is a global player in plant construction and mechanical engineering for the steel and nonferrous metals processing industry. The other JV partner is DP World, and so BOXBAY has the expertise of an operator of container terminals plus a powerful industrial group having experience as a system supplier. This combination is new in the environment of suppliers and manufacturers of container handling equipment.

The actual HBS initially provides a capacity of approx. 1.300 TEUs. During the start-up phase, which will begin soon, the high bay store, the stacker cranes, the underground container circulation system in the basement,

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the fully automatic truck handling crane and the software system will prove their interaction, performance and reliability.

The integration of the HBS in regular terminal operation is the main focus for the operation phase. Here the different interfaces to the horizontal transport systems like straddle carriers, terminal trucks and external road trucks will demonstrate usability and performance.

The BOXBAY HBS benefits from the AMOVA experience in the field of developing warehouse management and business intelligent software to control the facility in Dubai. The system is completely CO₂ neutral, because it uses electrical energy only, which can be generated as green energy. The roof of the facility can be fitted with solar panels to further improve the energy efficiency.

BOXBAY HBS is able to improve the operation of the terminal industry by adding additional throughput and storage capacity. Specially existing terminals which due to lack of space can no longer realize further expansion with conventional storage systems.

DP World will additionally build a visitor center next to the facility to demonstrate the BOXBAY HBS to interested visitors. It is planned that BOXBAY will also be showcased on the DP World impressive pavilion of the EXPO 2021.

INSIGHT

FROM THE BOXBAY PARTNERS

Q *The installation of BOXBAY in Dubai is now the first of its kind in the world. Have there been any problems with the construction and installation so far?*

A **Bernd Klein, CEO, AMOVA:**

“So far, we have not had any technical problems at all, because we are using exactly the same technology, which we are using in the steel industry since decades. The only difference is how the container is been picked up and dropped. Therefore, we use the same twist lock mechanism with commercially available spreader technology, which we have installed in the telescopic arms of the High Bay Stacker Crane. The Stacker Crane, the hoist, the drives, the PLC, the warehouse management software, the steel structure of the warehouse building, and the underground conveyor system, all these components are similar systems which we have been using in the steel and aluminium industry for already 40 years. The customers will get a mature and proofed system.”

Q *What are DP World's objectives as an operator of terminals as a partner in a JV that will market container handling systems?*

A **Ronald Van der Meer, Project Director HBS, DP World:**

“In late autumn 2020 we will show BOXBAY for the first time to the world. However, for sure, we will not use it only in Dubai. We have in our portfolio more than 10 terminals, where BOXBAY gives a solution for the problems we are facing over there, mainly a congested yard. Additionally, we also have strategic goals. Our target as DP World is to be a trade enabler and we think by adding this system to the market as a Joint Venture partner, we make it possible to do more business in many ports where it would simply not be possible due to geophysical conditions and socio-urban environment. In doing so, we attach great importance to contributing all our knowledge of one of the world's largest container terminal operators into the developments. According to my own experience of more than 30 years in ports, good system solutions have only been achieved through the complementary and harmonious interaction of operator and manufacturer. For the sake of the sustainability of such an ideal partnership, we have founded the JV.”

Q *For which applications is a BOXBAY High Bay Storage System actually suitable?*

A **Volker Brueck, Director Business Development, AMOVA:**

“BOXBAY can be used greenfield as well as brownfield. It is very well configurable and therefore suitable for retrofits of older brownfields, which cannot grow due to lack of space. You can start small and replace a part of the yard with the first BOXBAY modules to get operationally some breathing space. Then you can grow bigger and add modules, which could also be increased in length. BOXBAY is basically a toolbox to configure this system for any application. BOXBAY is not just a standard solution, but a modular system to configure the right handling system. As a first step we are now building a system in Dubai with interfaces to straddle carriers. However, we have also slightly different looking configurations for example with water-side interfaces to terminal trucks or AGVs.”



Q *What are the reactions of your market participants and how do you see the future?*

A **Patrick Bol, Director Global Operations, DP World:**

"BOXBAY is a new yard operating system in our industry. All the messages we have received from our competitors and customers, for example at conferences, were extremely positive. Many market participants have recognized that something has to change. Simply faster, higher, and the cry for better software will not be enough. New equipment solutions will be needed to meet increasing expectations.

"Of course, we have shown the system to the market in papers and conferences – since the TOC 2019 in Rotterdam. But our market is skeptical and conservative. Are they actually going to build it? And if they do, will it work? Will also the performance increase and not only the storage capacity? Is the solution not too complex? Does the software work? Will the software run and the interface to TOS? How can BOXBAY be integrated into existing operational processes?

"Therefore, we have now invested and built a first section. Before the end of the year, we will official start operations. In an adjacent visitor center, we will be able to show our market participants what has been developed in and how it works.

"My expectations for the future? In 10 years' time the JV BOXBAY will do very well with a roll out inside and outside the DP World portfolio. We will have applications in the port industry but also in the inland logistic industry. Space always comes at a premium, especially close to the waterfront but also close to rivers and in industrial parks and facilities, where big production lines have a requirement for a temporarily storage of containers."

Q *Would you say BOXBAY will not only change the processes at the location where it is build, but for logistics in general worldwide?*

A **Dr. Mathias Dobner, CEO, BOXBAY:**

"Yes, indeed, we have more and more expectations in short delivery times. E-commerce is doubling in size every four years. Cross-border e-commerce is leading the change. Virtual shopping malls will become common. But after the digital shopping process the reality begins. Goods must actually physically be moved immediately. Delivery times of 2-3 days may be accepted today, tomorrow we will expect a 24 hours delivery. This puts pressure on supply chains. Not transport speed, but reaction times are important. The nodes of the whole supply chain network must react more dynamically. This won't be possible with better logistics software only, but we need other equipment, able to execute these high expectations. It will not be enough to build faster and faster cranes to stack containers due to increasing ships high and higher. Other solutions must be implemented.

"BOXBAY, as a disruptive innovation, is such an answer. All containers can be addressed in direct access, water- and land-side is decoupled, no time-wasting shuffling, shorter truck throughput times, immediate reaction behaviour. Actually, we've been over this. These are just the advantages of high bay warehouses in the inland retail distribution. Why not also with containers?

"Here even we are not yet aware of all the possibilities. I actually see us at the beginning of a new era. A BOXBAY high-bay warehouse with its integrated conveyor system could not only serve a container terminal, but also same-time an additionally connected distribution center. At TOC 2019 we have already shown this vision: a landside LCL/automated distribution center, compressing the supply chain dramatically in length and time."