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CONTAINER HANDLING

Antwerp starts working with dual hoist-cranes

European crane scoop for PSA HNN

At PSA HNN, the first crane, that can handle two forty-foot containers in one move, thanks to two spreaders with individual lifting cables, is operational.

The scaling-up in container business offers terminals new challenges. For each berth more and more cargo has to be handled. This situation became very obvious in Antwerp the past weeks, when both the MSC Beatrice (13.798 teu) and the MSC Danit (14.028 teu) came to load and unload 9.500 and 8.200 containers. These kinds of operations take several days. In order to shorten the vessel's stay in the ports, productivity per crane has to increase. This can be realised if you could increase the number of containers you handle in one move. The former Hessenatie actually developed a very first twinlift a long time ago, they constructed a forty-foot spreader that could handle 2 twenty-foot containers at the same time. Today, this system is commonly used around the world.

But the twinlift has become outdated. Forty-foot containers are the new standard. The proportion is already 1,6. This means that thousand containers represent the equivalent of 1.600 teu, divided in 408 twenty-foot containers (408 teu) and 596 fort-foot containers (1.192 teu).

Tandem lift

A system to lift two forty-foot containers simultaneously is therefore becoming more and more of a necessity. The Swedish company Bromma was the first to develop a frame, with

two forty-foot spreaders hanging under the frame. Tests with this tandem lift in Algeciras en Rotterdam (Uniport) were not very successfully.

The Dutch spreaders manufacturer, Stinis, started in 2001 to develop a so called split headblock, with two spreaders fixed beneath, mutually independent. The sample copy was tested during two years at APM Terminals in Rotterdam and has been more developed since then.

Two of them have been sold up until now, and have effectively been put to use: the first one at the PSA HNN Deurganck Terminal, and the second one at Antwerp Gateway.

The advantage that the Stinis' split headblock has to offer is that it can be easily installed onto the existing cranes.

Only older cranes with a limited lifting-capacity can not be used for the purpose. At PSA this system is fixed to an 80 ton crane: after subtracting the weight from the headblock and both the spreaders, there is still about forty ton Nett weight left for the cargo. That is insufficient for two fully loaded forty-foot containers and insufficient for four fully load twenty-foot containers. That's why the lifting-capacity of the cranes was increased to 92 ton

Scoop

On December 17 2008, PSA HNN showed off with a European crane scoop. At that time the first Chinese cranes arrived, and all of them are capable working with two coupled spreaders, each depending on an individual hoisting cable. So on these new portal cranes, the cable work can be doubled. In jargon this is called "dual hoist". In the meantime, the Chinese ZPMC provided similar cranes to Hamburg and the same types of hoisting machineries are now on their way to Antwerp Gateway.

On PSA's Deurganck Terminal there are now five ZPMC-cranes of the latest generation.

They can handle vessels up to 22 rows of containers wide on the upper deck (type Emma Maersk). Their lifting capacity is sufficient, so after subtracting the weight of the spreaders, there is still 80 ton left for the cargo. 'They allow us to lift two forty-foot containers without any problem.' explains PSA's technical director. The only thing that is not possible is lifting four fully loaded twenty-foot containers simultaneously.

In case of failure of one of the two spreaders, the defective spreader can quickly be drawn up and the crane driver can continue his work with the second spreader. Thanks to this method, a team of workers will not stand around and wait until the defect is fixed. 'This is not a luxury, considering that 80 percent of the technical crane defects are spreader defects.'

As to the crane manufacturer, thanks to the dual hoist-system, productivity can be increased by half. Practice will show whether this is true or not.

Results will partly depend on the way of the vessel was charged. However in this technology the different heights of containers have already been taken into account. One spreader can be positioned slightly higher than the other one, so that the dual hoist simultaneously can pick up an ordinary forty-foot container and a hi-cube container

Chassis

In Asia the dual hoist technology has already been available for a long time, but in daily operations it isn't standard technology yet.

For example In Jebel Ali the one-spreader system is still often used. PSA knows the reason why. In a lot of Asian ports transport of containers between the crane and the container square is done with trailers or unmanned carts.

In order for the dual hoist system to work with these carts, the two chassis have to be positioned on the right spot under the crane in order to put the 4 teu on and off. In practice, the crane driver will often have to wait because the carts don't drive on and off fast enough, which of course will not generate a yield increase.

In Antwerp, PSA HNN consciously chooses to work with straddle carriers. Thus, the crane driver doesn't have to wait before dropping off unloaded containers on the front quay. The dual hoist technology even permits a distance of 1,6 meters between the containers in order to give the straddle carriers enough space to drive over the loading boxes. Although working with the dual hoist-technology does require an adaptation of the terminal traffic. More straddle carriers per crane are required, which makes the terminal traffic even busier. That's why PSA HNN has already rearranged the lanes under the crane.

The first dual hoist-crane was put into use in the beginning of this month and the release of the second of five ZPMC cranes is probably only a matter of days. This makes PSA HNN the first container handling company that can compare the result of the tandem lift with the Stinis' split headblock to the return generated by the dual hoist cranes. Stinis claims that their solution is a lot cheaper and emphasizes that it can quickly be fixed to existing cranes. The negative point is that the system can only be used on strong last generation cranes.

The other European cargo handlers will surely keep their eye on PSA's future choices. T Meanwhile the developers of new handling technologies keep on going. At Mawan Container Terminal in Shenzhen there is a crane in use, that can load or unload 6 teu per move, thanks to a so-called triple lift (three coupled spreaders). But Apparently this is not a real success. They also suffer from the fact that the automated carts or trailers on the terminal can't keep up with the speed of the cranes.

Both spreaders were coupled one to another, although they depend each on their own hoisting cables.

The five new portal cranes at ZPMC are the biggest in Antwerp.

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