



*Interview with
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In 2015, SRM carried out a scientific mission in Hamburg with the aim of gaining a better knowledge of the strategies and the issues regarding the maritime sector in a country like Germany, which is considered one of the top European countries as for maritime logistics. During the mission, SRM interviewed **Dennis Kögeböhn Partner at EMBA Shipping & Logistics, HPC – Hamburg Port Consulting GmbH**, who gave an “itinerant” interview in the HHLA terminal of Hamburg port providing valuable information about its structure and functioning.

What are the characteristics of the HHLA CTA terminal?

In operation since 2002, this is the last and latest out of 4 container terminals in Hamburg, the internet states that it has a capacity of 3 million TEUs, however, its capacity is greater than that. I'll explain you why: one of the criteria we use to determine capacity is dwell time, I like to compare it to a restaurant, for example if you go to McDonalds you would probably dwell about 12 minutes, if you go to a proper restaurant you would dwell for maybe 2 hours, which is 6 times as long. It's the same with containers; essentially from the ports perspective we are a production facility not a storage facility, we move containers back and forth. Clients and customers perceive things a bit differently but depending on the dwell time the capacity changes, therefore if you double your dwell time, you cut your capacity in the yard. We saw slight improvements, concerning 'dwell time reduction' over the last 2 years which has given us additional capacity.

We have sections where we can stack four containers high and we have room to hold a fifth container above it. This has been an automated facility for the last 10-12 years, there is a team of 10 people whose job is only to improve and optimize this facility.

It is interesting because this terminal is the most consistent and best performing in Hamburg. Clients tell the sales department at HHLA, which looks after 3 terminals in the port of Hamburg, that they want to go to CTA (Container Terminal Altenwerder). The response to “we are full” is “we don’t care, make it happen”.

Let me add that this facility is 110 hectares, with 1.4 km of quay and an investment of about €1 billion, half of it was for preparatory works from the port authority, quay wall, reclamation etc. The remainder comes from the terminal operators whose investment has been already paid off some time ago. As a matter of fact, we pay lower costs than elsewhere.

It is interesting traveling around the world and seeing all the costs that others incur, for example in India you probably won’t get the concession unless you pay 40-50% of your revenue, this has led to people moving out of India or joining forces.

What’s your average container dwell time?

4.3 days which is ok, although Australia is very good with 3.2. But in Russia for instance, it is the opposite because of customs clearance and all the paper work. In places like Africa it can even be up to 30 days.

Do you have penalties for exceeding dwell times?

There are storage charges which depend on the volumes handled. There are what we call a number of free storage days: the first 3 days you won’t pay but after you will. Just before the financial crises hit, HHLA said that they would reduce the average dwell time in order to create more capacity, by charging more for storage. However, it was more cost effective for some companies to pay for the port storage charges than to move their cargo off the container to a land storage. It didn’t help the port’s capacity and only reduced dwell time by a day a week, then it went back to where it was before.

What are the main global shipping lines that operate in the container terminal?

Here Haapag-Lloyd and NYK are shareholders; they obviously ensure volumes for the terminal. This helped during the crisis in fact while Hamburg lost 30% of its volumes this terminal only lost 15%. One of the main elements when it comes to ports, is landside which is as important as the quay side. Our biggest problem is that wa-

rehouses are open from the first shift, although at the moment there is not always availability, hence we are trying to implement advance bookings from users, with the possibility of prepaying for this service; this will decrease waiting times, with the benefit of truck drivers who turn up at random time. They come from Poland, Czech Republic, the Netherlands, Denmark, Southern Germany, and from other countries so we have experienced difficulties in trying to convey how our system works here as they are partly still manual, and now we offer the possibility to choose among 12 languages.

Where is maintenance carried out?

All the regular maintenance is done here, therefore we don't have any service contracts with suppliers.

What automated machinery are you provided with?

We have **AGVs (Automated Guided vehicles)** which are equipped with a maintenance scheme that controls tires, fuel levels, etc. The refueling of the AGV is also automated. The terminal also controls the most productive time to refuel, so when there is an idle period the AGV is refueled. We also have AGV's using diesel-electric and diesel-hydraulic engines and then a project for battery powered engines. Actually, we have a very green terminal because we use renewable energy and are equipped with a battery charging station. In Maasvlakte We also have different types of AVG's in the two new terminals powered by batteries, which weigh 12 tones and last 8 hours.

The terminal also features **RTGs (Rubber Tyred Gantry Cranes)** which are cost saving. In Japan and In Abu Dhabi RTGs are currently the most efficient system.

The use of automated machinery also guarantees safety; for the few people which work in the terminal there is a first fence and also a second fence which is a further protection between the internal manual section and the automated operation section. In Australia the regulations would probably require higher protection to prevent people from entering any restricted zone.

✓You have an automated quay, automated yard, partially automated crane systems but when the systems are out of work you can still operate in manual mode and the rail part is also manual, is that right?

The rail part is largely manual, the problem is with rail handling and some automation, what you really need is reference points.

If I had another ship for example, we would have the interface operated by a per-

son, he drops the container onto a lashing platform, a second container comes from behind and with an automated move it takes the container from one reference point to another. The AVG will ask the system where the crane is positioned and that is exactly where the AGV will stop. In 12 years of operation we have only had one incident with the AGV. The system tells the AGV where to go, the AGV looks for an area that is sufficiently long enough for it and then it claims the path. It is sufficiently long enough so that it has space if it needs to brake; when one AGV has claimed an area it cannot be claimed by another, so it is first come, first served, we may say. This system has been copied elsewhere and the safety records speak for themselves. They are also told which block to drive to; there are 26 blocks and 40 slots per block. When a container is delivered to the terminal the system tries to find the most suitable slot for it. There are some considerations and factors in place to take into account, e.g. driving distance, class etc.

It seems easy, but has it been a lot of work to get this in place?

Well, it seems easy but it took 200 “man years” of work. HHLA developed this system in house.

Is this based on an algorithm or is it based more on the experience of how the terminal is operated?

The first thing that I did in 2002 was to look at the overall operating systems in the terminal, looking at how I could cut down the idle and waiting times. At that time the system wasn't as sophisticated as it is now, 10 or 12 people have spent more than a decade trying to optimize this terminal.

This is the CTA experience: how can others follow this model?

The Burchardkai terminal is being converted from a manual to a semi automated mode, here you can see two cranes that are unique in size, you won't find any other terminal in the world with this system. If you have equally sized cranes they cannot work throughout the night, work load differs, this might not work in other ports but it works here and we went for that given the transshipment that we have. The Burchardkai has different sized cranes and it works for them too. Its individuality keeps a lot of mathematicians very busy.

How many automated terminals are there around the world?

If you count AMPT Maasvlakte there are 6 fully automated terminals, this is the second. Automation implies meeting some port design criteria for the quay load, the

quay wall and the exact force that the wall is supposed to take. It was designed to take a 1600 tones crane. One disadvantage is that they have 2 rails tracks and the track alone costs €1600 a meter to repair, another is the space it takes up.

In Rotterdam a large investment has been made for remotely controlled cranes which don't have a cabin on the quay crane, instead, they have a lot of cameras transferring data back and forth, it is a big investment. One of the drivers to go for remotely controlled cranes in Rotterdam was the sheer movement, because they are designed to hold larger vessels than the 18/19.000 TEU vessels that they have now.

People are always rigorous about automation. We don't lose boxes and if we deliver the wrong box that is caused by humans because by the time it entered the terminal it was checked incorrectly, which on the waterside is a manual process: a container comes in and the operators let it in. There is a one in ten chance that they have a box that shouldn't be there, the system normally can tell this but it still happens about twice a year. Despite the high automation level, we have restrictions in terms of accessing the port because of the shallow river, so vessels can't come in fully loaded. Hamburg is the last port of call in the Northern Range so they drop off a lot of cargo in Rotterdam, then they arrive here and we take out the rest, we put in a lot of empties also.

Can you describe the container transfer process on trucks?

Normal RTG terminals would work with parallel blocks and the containers would always be parallel to the quay, Here, instead the stacks are perpendicular. As trucks are manual and everything internally is automated we don't want this to be mixed. Truck drivers are not physically on the vehicle at the time of delivery; they swipe their container ID card which tells the system they are at the hand over position and the system will initiate the handover to the truck.

Why you don't want the driver to be on the truck at the time of the hand over?

Because it is a remotely controlled automated process. The drivers sit in an office where they can't see the yard but a screen with 4 different pictures to guide the drop for the container onto the chassis which is extremely accurate.

There is a long distance from the crane to the ship, at least several hundred meters, right?

Yes, because we have a tidal range here so there is a lot of movement, although there is a mooring master, a fairly expensive piece of equipment which holds the ship in a precise position.

The other element that we experience on the terminal is sediments. We are on reclaimed land, there used to be water here and now we are on sediments. The risk, as confirmed by some astonishingly accurate projections is that some areas can subside. The systems in the yard are all designed so that you can re-level the ground. You could have a different solution like Abu Dhabi where there was a multi-million investment.

How does the terminal handle out-of-gauge-cargo?

In sales terms, out-of-gauge cargo is a big problem for the terminal because being outside of the normal range it is difficult to handle and is very cumbersome, moreover it isn't easy to find a dedicated area and the sales staff has to take it into account. However, out-of-gauge cargo come with half a million standard containers, therefore I see a lot of specific plans for it. At the moment they are allocated in block 11 where we put other out-of-gauge cargoes like dangerous goods and reefers. These latter need to be plugged and also need a specific access, so once the system knows that they are in it blocks them preventing from being handled. In Australia regulations about out-of-standard cargo is much more rigorous.

What is the impact of railway intermodality on container shunting?

Here in Hamburg there are some railway operators like Behala, Polzug and Metrans which go to the Eastern Europe. However I believe that the system should be improved and that at the moment road transport is more efficient. To confirm this, booking of the truck saves us a lot of time and increased bookings mean increased earnings. There is little or no queuing here.

I was interested in integration regarding the terminal and logistics service provider, as the synergies are not as strong as we might think, and I was intrigued by your comment.

You cannot optimize a logistics service provider's business to the detriment of the terminal and vice versa. Hence, it is more important to have mutual benefits for all of the parties involved, although this is an ideal situation.

What is your opinion about the future development of the port?

There is no shortage of too optimistic speculations; in 2005 a study that projected Hamburg to do 17 million TEUs for this year was carried out. At the moment we're all concerned about optimization: if you increase a quay crane's availability and use by 1% it brings about €30,000 saved annually.

Our quay cranes are really sought after due to optimization. Over the last years our reference markets have changed too; previously most of our work used to be with the Middle East but now we are working more with Asia, East Asia and also Australia and New Zealand, who are optimizing port operations.

What is the shortest route to Asia? Is it through the Suez Canal?

Through the Suez Canal and then Singapore, yes.