



Pushing automation to the limit

If you're an operator with a dream of running the most advanced marine container terminal in the world, there's only one way to go: design and build it yourself. That's exactly what APM Terminals (APMT) did. Managing Director Frank Tazelaar tells us why.

Once complete in 2014, APMT's new terminal at Maasvlakte II on the port of Rotterdam will boast the world's highest ship-to-shore (STS) cranes. It will also be one of the two first terminals in the world whose STS cranes operate without a driver on board. The other terminal, Rotterdam World Gateway, is also due to open at Maasvlakte II next year. The cranes at both terminals will use ABB Crane Systems' technology.

"These type of terminals are so new that outsourcing the design and building was never an option for us," says Tazelaar.

Remote control was first used on stacking cranes. Since then, ABB has developed the technology

further for use with STS cranes and they can be operated from a control center. Automated and remote controlled cranes will not only improve productivity, they will also provide operators with a more comfortable, ergonomic working environment.

A leading technology

"We've really taken automation as far as we could, given that we also have to open on time. I think we've taken some courageous steps in implementing new technology," says Tazelaar.

"ABB piloted the remote control of STS cranes in Panama and we are the first client to use this on a large scale at a working terminal. It's leading technology and the first of its kind.

APM Terminals

- 23,000 employees in 68 countries
- Interests in 70 port and terminal facilities
- Provides port management and terminal operations to over 60 liner shipping and port customers
- Named “Port Operator of the Year” in September 2009 at the annual Lloyd’s List Global Awards Gala
- Headquarters in The Hague, the Netherlands
- Part of the A.P. Moller-Maersk Group

How remote controlled STS cranes improve productivity

- Less stress on back and neck of operator working remotely in an ergonomic environment
- Onboard cameras give better views than those from a cabin
- Cranes are faster and ramp times shorter
- More aggressive corrections possible without driver on board

“You can outsource the design and building of a terminal like this if you’ve done it two or three times successfully. Then you have the right people and the right track record to challenge whoever takes it on. At the moment we’re not an organization that has built many automated terminals on the go and this type of facility is still scarce.”

Worldwide there are only three terminals that use full automation: Euromax and ECT in Rotterdam and CTA in Hamburg. APMT also runs a semi-automated terminal in Virginia in the United States.

Pace accelerating

The state of port automation today has been 20 years in the making. ECT paved the way, opening in the 1990s, CTA in 2002, then Euromax in 2008. Now, five years later, the two at Maasvlakte are in progress.

“So the pace is accelerating and I’m sure there’ll be more, also moving to other parts of the world. But there isn’t a vast track record compared to the hundreds of conventional terminals around the world,” says Tazelaar.

“Full automation is still very new and small. It may be getting a lot of attention now because it looks big. But that doesn’t mean it’s all easy going and we’re done. The resources are scarce and the experience is limited.”

A unique project

Tazelaar notes that the APMT terminal project is unique “because we already have a working organization in Rotterdam. We know the place, we are adding something new, including new people, and we’re doing that for a client [Maersk Line] that is introducing the next generation of vessels.”

These ships will be bigger and with a capacity of more than 18,000 TEU. APMT’s new terminal will expand its capacity by 4.5 million TEU per year.

“Besides being the highest, the STS cranes are also able to cater for coming generations of vessels. So, they are future proof in terms of height and width,” Tazelaar says.

The initial phase of the project started with a team of five in 2008, which has grown to the current 40. By the end of the year, he expects the organization to have doubled.

We are targeting 25 to 30 percent more productivity than at existing European terminals.



APMT has a 50-year concession for the terminal. It is currently building the first 86 hectares but will be able to expand by a factor of two in the future, adding more quay wall and stack.

“Probably that will be more copy and pasting, not as exciting as what we’re doing now. These expansions will come on demand if the market and client need is there. And I’m sure that will come. Then we will be able to expand quickly,” says Tazelaar.

“It’s a combination of enormous pressure and freedom building a port like this from scratch. You have the responsibility of developing something for the next 50 years.”

Reaching out

“What we realized from the beginning was the need to reach out to colleagues, other terminals, clients and various stakeholders to see how we could get the best out of this terminal. Selecting the right suppliers was also crucial,” says Tazelaar.

“The combination of automated technology, civil equipment, IT and operational organization all has to fit together in one system. It’s crucial for the teams to work towards a common goal.

“This industry isn’t mature enough yet to say to one supplier: ‘You take care of this and I’ll wait for you to knock on my door when you’re ready.’ This still has to involve a lot of our own thinking because we’re implementing new technology.”

With so many interfaces between different suppliers, Tazelaar says one of the most important criteria in selecting suppliers was “the willingness to do this together.”

“It sounds soft but it’s very hard. In the tender process we did the selection on all kinds of criteria but getting to know the supplier and its team, knowing who will take the effort, is important to us. We’ve had some tough negotiations with suppliers, not just based on price but especially on quality,” he adds.

Where to, Rotterdam?

It may be the largest port in Europe, but Rotterdam's value has less to do with its size than its strategic position. With two new terminals about to take off, this shipping hub has its sights set on expansion.

Penetration into the hinterland will be a big part of this growth, predicts APM Terminals Managing Director Frank Tazelaar.

"If you look at Rotterdam with the existing and new terminals, each of the top 10 shipping lines all have a vested interest, either by way of a long-term contract or shareholding," he says.

By far the majority of exports outside the European Union travel via the port of Rotterdam; what these players are looking for is guaranteed access to capacity at this busy port.

"You can't miss Rotterdam in your network, even as a shipping line that has a terminal operator acting on its behalf," says Tazelaar, adding that the biggest challenge for Rotterdam is to "take one step further" by penetrating eastwards, either via the feeder to the Baltic or rail businesses towards Eastern Europe.

Investing in Rotterdam

"I think with the additional investment in rail, both on the new terminals and on the rail network, we're well positioned for that. Rotterdam will become more important for a bigger part of Europe than it currently is," says Tazelaar.

The fact that Rotterdam is not just a container port but also serves chemicals and has a large bunker business adds to its attraction. Up until 2004 Rotterdam was the world's busiest port, a title that then went to Shanghai and now belongs to Singapore.

According to a recent press release from the Port of Rotterdam Authority, Chief Executive Officer Hans Smits says the business sector is investing almost 11 billion euros in the port area during the period 2011 up to and including 2015.

Construction on the RWG and APMT terminals marks the beginning of corporate investment on the land expansion. In the existing port area, there is ongoing investment with projects in refining, chemicals, tank storage and energy.

"This is evidence of confidence in the port of Rotterdam, and also positive expectations regarding the economic developments and integration of Europe," says Smit.

Tazelaar says the new terminal is "the ultimate in terms of productivity, reliability, safety and sustainability. We are targeting 25 to 30 percent more productivity than at existing European terminals. We'll need a few years to get there, but it's all in the specs."

Zero emissions facility

Besides the unrivalled speed, height and productivity of its STS cranes, the terminal is also a zero emissions facility and its automated vehicles will run on batteries.

"The good thing with the full electrical choice is that we are now flexible to follow any developments on the energy front. If coal shifts to gas or gas to wind and solar, that's good for us. If our vehicles were running on diesel, we'd be stuck on the fossil side," explains Tazelaar.

The port of Rotterdam is one of the biggest land reclamation projects in Europe, and the two new terminals at Maasvlakte II herald a new chapter in its history, as

well as that of APMT, its clients, suppliers and indeed Europe. As Tazelaar puts it: "A lot of people on our team feel this is a once-in-a-lifetime opportunity." (See also page 26.)

Text: Helen Karlsen

Photos: APM Terminals