



Rotterdam ECT Delta container terminal

# Port of Rotterdam focuses on safety, efficiency and the environment

The Harbour Master and the port managers outline how MARIN helps Rotterdam achieve its goals.

**P**ort of Rotterdam is the fourth largest port in the world and by far the largest in Europe. MARIN works regularly with this leading port authority in a wide range of projects and studies, all designed to make the port as safe and efficient as possible.

Rotterdam holds a leading position in the Le Havre-Hamburg port range, handling 430 million tonnes of cargo in 2010. Willem Hoebee, Manager Shipping Affairs Port Planning & Development comments: "Within 600km there are 10 deep-sea ports which are our competitors. Considering oil, iron ore and coal we are unbeatable and we have a very good position in container traffic." Rotterdam's geographical location and accessibility to the River Rhine is a major asset and the fact that it is, for the most part, tide independent with very deep water, he says.

**On schedule and on budget** The Rotterdam executives feel that the port

"recovered remarkably quickly" following the economic slump, already climbing above the record levels of 2008 last year. In the slump, the liner carriers consolidated reducing the number of port calls. Ironically, Rotterdam profited; rather than being skipped lines often chose Rotterdam above other ports.

The port authority is particularly pleased that of 10 major infrastructure projects going on when the recession hit, only one fell through. They went ahead "as planned, on schedule and on budget", Mr Hoebee stresses, including the huge land reclamation project Maasvlakte II that will see the port expand by 20%.

Another project that got underway was the 1 billion Euro Gate Terminal, which is the first LNG import facility in the Netherlands. In mid-June the first LNG carrier the "British Trader" arrived and Gate should be fully operational in September.

**Safety first** As well as the major construction projects underway, Port of Rotterdam has several other developments up its sleeve. The port is currently putting a tender out for Tank Terminal Europort West, which is an 80-hectare site available for oil products. Rotterdam is also looking at the possibilities presented by small-scale LNG and using LNG as a bunkering fuel. CO2 and carbon capture storage is yet another idea being mulled over by the port. "Rotterdam is really developing as a complete fuel hub," Jan Prince, Senior Project Manager Division Harbour Master tells Report.

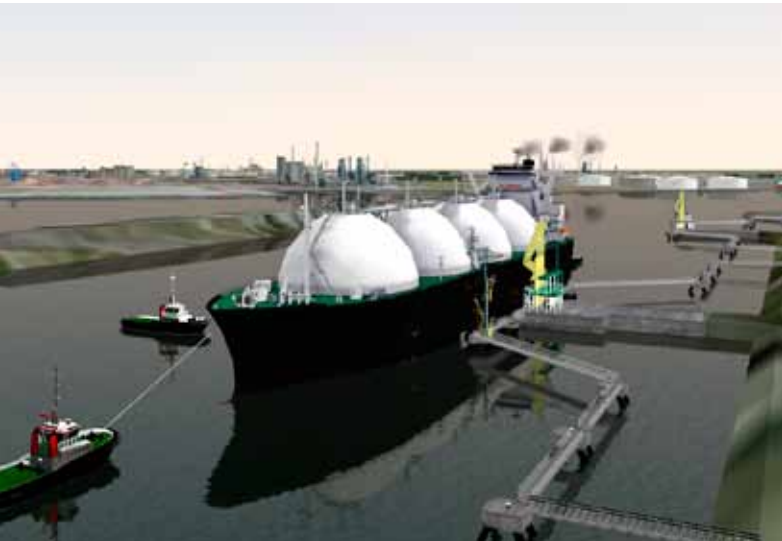
And because the Harbour Master is responsible for all aspects of the port's safety his office is actively involved in all port projects right from the design stage. Harbour Master René de Vries has worked for the port authority since 1982 and although employed by the port authority, he has an independent role and reports to



Rotterdam Maasvlakte 2



(From left to right) Willem Hoebee, Rene de Vries and Jan Prince



Simulations executed at the Rotterdam Gate terminal



The first LNG carrier the "British Trader" arrived at the Rotterdam Gate terminal last June

the Dutch government and the Mayor of Rotterdam.

"Safety is of the utmost importance of course," stresses Mr de Vries.

Rotterdam has a very good name in nautical safety terms, so every design for a new basin or development has to be top quality and therefore, it all has to be approved by the Harbour Master, he says. The port authority and Harbour Master's office work very closely together to find the best solution for the port, adds Mr Hoebee.

**Simulator studies vital** "Any new infrastructure is going to be there for 25-50 years or more and the projects are very expensive; Gate represents a 1 billion Euro investment and Maasvlakte II, 3 billion Euro. We put a lot of effort into the basic design, because once it is there it is difficult and very expensive to change."

The port carries out simulator studies for any new development or for major changes to infrastructure and MARIN is involved in many of these. The executives quip that in fact Maasvlakte II has undergone seven or eight simulations and the Amazon Harbour maybe 10. This harbour was designed for 5,500 teu vessels and now it has to be widened to handle the latest generation 13,000+ teu vessels (see page 9).

One project involved the new Gate Terminal. "MARIN carried out very valuable research into the nautical access policy for the LNG facility. The study looked at what the

chances are of an LNG carrier having a collision. For this the tool SAMSON was used to calculate the number of ship meetings, the chance of accidents, passing distances etc.

**MARCOL** For the likelihood of the penetration of the cargo tanks MARIN and the port authority invested in a new tool. It showed that the possibility of a collision was quite small and would have to involve a bulbous bow travelling at considerable speed and at a crossing course. MARCOL could carry out lots of runs in a short timeframe for different ship types, bows and angles. The admission policy was then developed based on these studies. Crucially, the port decided not to apply an exclusion zone around LNG carriers in transit to prevent creating delays for other vessels.

Pilot simulation training also took place and actually the entrance procedure was changed on the back of this. Mr de Vries points out that simulation studies play a very important role in convincing the port's board and its clients to go ahead with projects.

The ROPES Joint Industry Project is another instance of MARIN and the port authority working very closely together (see page 12). As the Calandkanaal gets increasingly busy there is much more interaction between moored and passing ships. "We need better tools to calculate these interactive forces. Recently, we have seen more instances of broken ropes, so we need to know what causes it; is it the mooring configuration,

the layout of the shore equipment, what are safe passing distances and speeds?" says Mr Prince. The three-year ROPES project started this year. "The outcome of the project will be a very big benefit in helping the port to optimise new and existing berth arrangements, mooring plans, the passing distances and speeds and it will give us an improved model to enable ports to calculate the forces acting on the moored ship by the passing ship. And this will also be validated," he emphasises. Full-scale tests will take place in Rotterdam in September.

Simulation studies have also been carried out for the Vulcaan dock where DFDS Tor Line, (formerly NorfolkLine), is located. With ferries of almost 200 metres in length, it was important to see if they could sail at all times, not just in slack water.

**Highly skilled staff** The Port of Rotterdam would welcome further research in several key areas such as the impact of quays on manoeuvring and the influence of stratified current forces.

Crucially, the port's executives stress any simulator study or research project has to be coupled with highly qualified, well-trained staff with a nautical background, so the results can be interpreted correctly. And MARIN has this ability, they emphasise. MARIN can bring its experience of other simulator studies and ports and this contributes to the overall quality of any study. ▢