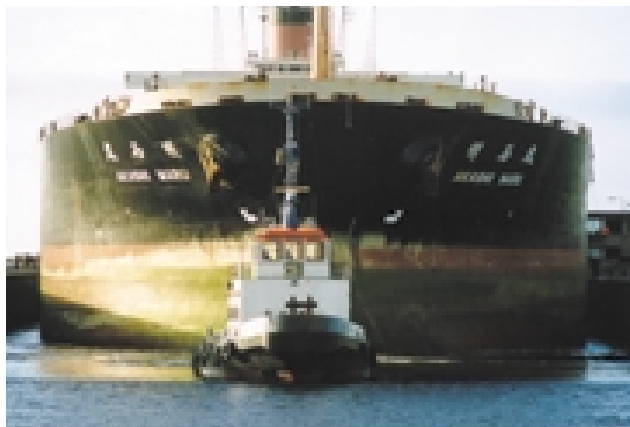


Courtesy Amsterdam
Port Authority.



Here the work of MSCN is considered as it continues to strive for 'a safe and efficient' maritime environment.

regarding accessibility, ships must enter ports without delays but naturally there is a need for safe ports too. These two demands can often be contradictory and they require a methodology which must balance safety requirements against their effectiveness, so effectively reduced risk versus cost.

Increasing position accuracies

MSCN has also seen that developments in electronic equipment make it possible for pilots to carry accurate positioning systems onboard vessels. This makes it possible to reduce inaccuracies in the position fix and enables larger ships to use existing infrastructure. It is one of the important new

MARIN's nautical centre MSCN

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Recent developments in shipping show two important trends. Firstly, more dangerous cargoes like chemical products and LNG are being transported and secondly, the average ship size is still increasing. These trends are reflected in recent port studies that have been carried out at MARIN's nautical centre, MSCN. Many studies MSCN has been working on such as Bilbao, Ferrol and Milford Haven, have involved the reception of LNG, and of large container vessels such as Maasvlakte 2.

developments on the Western Scheldt, where increasingly larger ships transit the relatively-narrow (two lane) channel to Antwerp. This is often a question facing many port authorities - can they receive bigger ships or new ship-types, carrying dangerous cargo, with the existing infrastructure. Also important are developments in tug design and operations. New designs make tugs more effective, especially when assisting in waves.

In these port studies effectiveness and safety are important considerations. There are high demands

Fast time

But what is the consequence of these developments regarding nautical studies for ports and fairways? (An overview of the available tools in the various

design phases is shown in Table 1) A good example of rules developed by experts are those developed by PIANC (Approach Channels, A Guide for Design, June 1997). These are used to make a first estimate of the required access channel dimensions. However, such a set of rules is based on experience from the past, the latest developments are not always incorporated, therefore experience always counts. MSCN actually has a small tool

Table 1.

Tool	Phase (port design)	Generic vessel			Port		Environment (waves, currents, wind)	Organisation
		Daily Operations	Human Failure	Technical Failure	Traffic	Lay-out		
Expert rules or Expert opinion	Concept Preliminary	+					+	
Fast-time simulation	Preliminary Bid	+					++	
Real-time simulation	Bid Final Regulatory	++	+	+			++	+
Quantitative Safety Assessment			++	++	++	++	+	
Formal Safety Assessment	Final Regulatory		++	++	+	+		++

Explanation: + Reasonable or ++ Fully covered by this tool

available to apply the PIANC rules. (A copy can be emailed upon request, see reply card) Fast-time simulation models have hydrodynamic capabilities equal to a real-time simulator but the vessel is steered by an autopilot. The autopilot is ideal as it makes making comparisons and ranking different layouts in a preliminary design phase, much easier. However, experienced users can also draw more final conclusions on the basis of fast-time simulations.

Your partner

But of course, port and channel design simulator studies are the final 'proof of the pudding' and here MARIN's nautical centre MSCN can be the

MARIN's Nautical Centre MSCN

As one of the world's leading institutes in ship research, MARIN is active in research and consultancy for the maritime industry and for governmental organisations. MARIN focuses on all hydrodynamic aspects of maritime vessels and floating constructions.

The Nautical Centre MSCN focuses on maritime operations with the ultimate aim to pursue 'nautical safety and efficiency'. The 'navigator' and all that is needed to improve their performance at sea and in ports, stands in the spotlight. MSCN's activities concentrate on consultancy regarding the safety of shipping, the design of ports and fairways, simulator training for professionals, (including VTS personnel) and the design and development of nautical simulators and simulation packages.

provides the missing link



missing link! Undeniably, with access to up-to-date hydrodynamic modelling, MARIN is the partner for advanced simulator studies. A logical sequence in port design is as follows: expert rules, fast-time simulations and real-time simulations respectively (see Table 1). In the case that only the ship size or ship type is changing then there is no reason not to go to the simulator immediately. This then involves stakeholders such as pilots and tug masters, directly in the decision or design process. Modelling is very important, not only related to the ship manoeuvring models but also wind, waves and currents need to be modelled accurately. Here, MSCN often cooperates with WL | Delft Hydraulics.

Safety assessment studies

Simulator studies gives insight in the safety of regular operations and to a certain extent one can include emergencies in simulator studies and study the counter measures. Integral safety assessment studies give insight into the frequency of these emergencies and their effect in terms of damage, spillage and ultimately, the individual or societal risk. These results help to identify the most effective measures of reducing risks.

Training helps improve safety levels

Simulator pilot training is also an important tool to improve the safety of ports. It can be used to familiarise pilots with standard local procedures, electronic equipment or with special manoeuvring devices (pods, azimuthing thrusters etc.). In addition pilots can practice manoeuvres, emergency procedures and optimise procedures together with the tug masters. MSCN has seen that more pilots are training at its facilities. Recently, pilots have come from the Humber, Milford Haven, Firth of Forth, Port of London, as well as the Netherlands. Dutch pilots have three local simulators based on MARIN/MSCN technology and in the near future, the Port of London pilots will also have their own MARIN/MSCN simulator.

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