

NAUTICAL SAFETY ASSESSMENT REAL-TIME SIMULATION SUPPORTS FORESIGHT

Bigger and bigger, longer and longer: dimensions in container shipping are constantly on the increase and the consequences not only concern shipping channels – the areas where big ships meet and turn and the jetty walls also need to be adapted to suit the new conditions. In this context we encounter the question of how navigation can be organised safely: is it possible to avoid accidents? This is equally interesting to port authorities, terminal operators and shipowners, who are worried about the safety of people, ships and infrastructures.

The real-time simulation developed by the Fraunhofer CML allows the evaluation of risks of collisions or other accidents, e.g., too high speeds or even commu-

nication problems between two ships. The CML offers strategic support in the matter of how wet docks and shipping channels need to be designed to allow safe navigation. In addition, the experts in maritime logistics offer advice at an operational level: what is the best manoeuvring strategy for the safe berthing and casting off of ships in adverse weather and traffic conditions?

The CML's nautical assessment is based on the latest academic expertise. Determination of the environmental parameters of the port, terminal and ship is followed by digital visualisation in the CML planning environment. The subsequent simu-

lation of different scenarios is performed three-dimensionally among other things. The assessment of the simulation cycles identifies potential risks in a maritime traffic environment and provides definitive statements on the safety situation.

Lookout on the bridge: Just one aspect of safe navigation.

TRAFFIC SIMULATION FOR HINTERLAND TRAFFIC DETERMINING THE CAUSE OF BACKLOGS IN TERMINALS

More containers in less time: the growth of the container ships is soon set to reach a capacity of 22,000 TEU. Even though only a part of this quantity is always handled in the ports, the number per ship's call is rising steadily. The use of important infrastructures is becoming a decisive factor in the competitive capacity of a port and the

region. The CML employs different tools to determine the capacity in nodes and corridors with high turnovers and to predict developments.

For example, the cell transmission model is used for localised matters such as the connection of a discharge seaport terminal to the closest motorway. It displays the movements of individual vessels in cells which symbolise 20 m-long stretches of roads. A simulation shows which increases in traffic in which sections and at which nodes can lead to tailbacks, and as such makes it pos-

sible to plan relief measures in good time.

Larger-scale projects representing interregional traffic flows require more powerful software tools. CML scientists are currently developing a transport model which compiles authoritative forecasts for individual transport corridors and modes of transport. The use of this transport model is intended to simulate the consequences of planned infrastructure projects. Reliable forecasts are a decisive requirement for the planning of ports, terminals and hinterland connections. In the future it will be possible to optimise these forecasts with the CML's instruments. This will not only save time, but also costs.

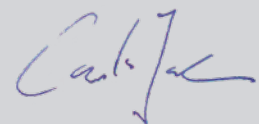
FOREWORD



Dear readers,

safety in the shipping industry is a field with which many maritime experts are occupying themselves once again this year and the Fraunhofer CML has been dedicating itself to this topic intensively over the last few months. In our latest newsletter you can find out more about the process we have developed for optimal nautical assessment.

In addition, I travelled to Asia in February to take part in the first „Traveling Conference“ there. This conference was held under the auspices of the Asian-German Knowledge Network for Transport and Logistics (AGKN). Together with five German and four Asian colleagues from different universities I travelled across the continent for ten days and gave presentations at selected academic institutions. The aim of this cooperation is an academic exchange between Germany and the APRA (Asia Pacific Research Area), the world's third-largest agglomeration for research and education



Have fun reading!
Prof. Carlos Jahn,
Head of the Fraunhofer CML

Competitive factor of hinterland connection



POTENTIAL FOR SAVINGS IN THE TERMINAL VISIBILITY OF ENERGY CONSUMPTION

Maritime navigation goes a long way on very little: a glance at the CO₂ emissions for this sector shows that they are extremely low in comparison with those in the transport trading volume. In contrast, there is a great potential for saving in the handling in the

port terminals. Scientists at the CML were able to show as far back as 2010 that by replacing outdated equipment and organisational measures it would be possible to save between 15 and 20 per cent of the energy emissions of an average terminal.

With the help of the planning and simulation tools at the Fraunhofer CML, it is now possible to visualise the energy consumption of terminals. Information is collected for every element of the terminal – be it a crane, vehicle or building – with the help of a database, which displays specific consumptions, emission values and capacities. In this way, it is possible to display the energy efficiency of the terminal and assess current and future processes. In addition, the possibilities for supplying energy using renewable energies such as solar energy, wind energy and biomass energy are evaluated. The basis for this is the energy management, which monitors the energy supply and energy consumption. „Our visualisation model, complemented with analyses and research, will be a very helpful tool in the course of the increasing efficiency and sustainability requirements on terminals“, said Dr. Svenja Töter of the Fraunhofer CML.



The virtual, energy-efficient terminal already unites the generation and use of renewable energies.

AMBER COAST LOGISTICS EXPERTS PRESENT FINAL REPORT

Accessible, multi-modal and connected: Those were the keywords most used during the presentation of the final report of the Interreg IVB project Amber Coast Logistics (ACL) at the end of February. The project team from five countries bordering the Baltic Sea and Belarus has been investigating the accessibility and logistics structures of the southern and eastern Baltic Sea region since October 2011.

The CML's duties in this project encompassed the ascertainment of the technological and physical accessibility of the southern and eastern Baltic Sea region and the compilation of a forecast for the future development of the maritime transport requirements. The report details the opportunities and challenges of the region's infrastructure: the information and communication technologies, rail services and road net-

work all urgently require expansion. In addition, the project participants recommended simplifying the clearing processes between the member states of the EU and the EAEC (customs union between Russia, Kazakhstan and Belarus) with the aim of making them more dependable.

„The integration of the non-EU member state Belarus in this Interreg project proved crucial for the achievement of the project's goals“, said team leader Ralf Fiedler from CML.

Further details can be found at www.ambercoastlogistics.eu.



Harmonised clearing processes should reduce lorry congestion at borders.

KURZ NOTIERT

e-Navigation Underway

The international conference e-Navigation Underway 2014 was held on the MS Pearl Seaway from 28-30 January. The CML demonstrated the relationship between e-Navigation and unmanned shipping at its booth and in presentations.

HILDE

In the cooperation project Hinterlandlösungen durch Effizienzsteigerungen (Hinterland Solutions based on Efficiency Increases), the project partners, including the CML, develop efficient multi-modal transport chains. The aim is to increase the proportion of rail and inland navigation vessel traffic in the hinterland traffic between Hamburg and Saxony.

Digital Ship

On 5-6 February a whole host of shipping experts met on the Digital Ship in Hamburg to find out more about innovative communication channels and the latest technologies in the industry. The CML demonstrated its optimisation solutions for crew deployment and procurement tasks.

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- **Tag der Logistik**
10.4.2014, Hamburg
- **4. Intern. Hafenkongress**
5.-6.5.2014, Karlsruhe
- **CeMat Hafenforum**
21.5.2014, Hannover

IMPRESSUM

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