

## NEW WEATHER ROUTING MODULE CML CALCULATES OPTIMUM ROUTE FOR „VINDSKIP“



Vindskip™ can be put out to sea for the first time in 2019 using the new Weather Routing Module

In the past five years the Norwegian Terje Lade has designed the hybrid vessel Vindskip™, the hull of which is shaped like a symmetric hydrofoil. To a large extent the vessel is propelled by the wind. According to Lade AS, the ship, which is also equipped with a propulsion engine running on liquefied natural gas (LNG) for low-wind passages and maneuvers, is intended to achieve fuel savings of 60 % compared to a reference ship on routes with optimum wind conditions. It is planned to put the

Vindskip out to sea for the first time in 2019. In the past few months Fraunhofer CML has developed a customized Weather Routing Module to find the best sailing route for the wind-induced propulsion. This module calculates the optimum route and speed considering the expected weather situation. These calculations are based on mathematical modules in due consideration of the specific aerodynamic and hydrological data of Vindskip as well as the forecast of the wind velocity and

direction, wave height and the prevailing stream conditions. „The more precise these conditions can be predicted, the more exact the Weather Routing Module calculates the route using our navigation algorithms“, says project manager Laura Walther. The result of the optimization is a travel plan that includes all waypoints of the route, the speed profile to be expected and the fuel consumption for Vindskip. The data is to be taken into an electronic navigation system where it will be visualized.

## MEASURING OF PORT PERFORMANCE PORTOPIA BRINGS PORTS INTO THE CLOUD

The European ports regularly deliver data and information to ESPO, the European Sea Ports Organization. The PORTOPIA project investigates how this data can be used more efficiently in the future.

The 12 project partners from 9 European countries have developed a new „Rapid Exchange System“ for the fast data exchange in the PORTOPIA Cloud since the beginning of the project in September 2013.

The ports transfer the necessary data such as the handling volume to the cloud server and, after the evaluation, can view the performance of all participating ports, which remain anonymous, over a longer period of time on a



Fast data exchange for ports

dashboard. Other performance indicators that are often not accessible for smaller ports, e.g. the impact on employment, gross value added or environmental records, are also calculated and made available to the port authorities.

With the help of the supporting system smaller ports, too, will be able to recognize developments at an early stage and represent their economic importance profoundly in the region. For more information see [www.portopia.eu](http://www.portopia.eu).

### FOREWORD



Dear readers,

*Will the ship of the future sail without a crew? In the last three years the Fraunhofer CML has developed the concept of an autonomous ship on behalf of the EU. The innovative results have been presented on the Nor-Shipping in Oslo and the MUNIN Final Event in Hamburg.*

*Another exciting CML project is the development of the risk management system MITIGATE. The project that is being sponsored by the EU simulates risk scenarios in a digital simulation environment in order to detect and avoid dangerous cyber attacks in advance – as well on nautical infrastructures – in the future.*

*There is also some news from other projects: Read about the PORTOPIA project and our innovative Crew Planning Software which is just in its „On-board testing phase“ in this CML Newsletter.*

Enjoy reading!

Sincerely, Prof. Carlos Jahn  
Head of Fraunhofer CML

## TEST PHASE „ON BOARD“ BEGINS CREW PLANNING SOFTWARE IN USE



The Onboard Module is being used for the first time in live operation

How many crew members do you need for a sea voyage? Will you be able to comply with working and resting hour regulations on the planned route? The Fraunhofer CML, E.R. Schifffahrt and Bernhard Schulte Shipmanagement together have developed a tool that delivers important information just before the departure of the ship: the Crew Compliance Optimizer CCO. The CCO consists

of three essential components: (1) The Office Module calculates the number of seafarers depending on the route, the type of ship and the specific work to be done. It is based on a jointly developed classification scheme of all tasks necessary for the operation according to the type of ship. The Office Module of the Crew Planning Software has been successfully used since the last winter.

(2) The Reporting Module reduces the administrative effort traditionally associated with tracking and documenting working and resting hours.

(3) The Onboard Module allows the commander of the ship to respond to changes occurring during a trip and adjust the work schedules according to the legal regulations. The Onboard Module is presently being tested during a period of three months in live operation aboard two ships. The CML has provided a computer with the appropriate software to the officers on the bridge. „We are optimistic that the module will fulfil the complex tasks. Nevertheless we will also be informed about deviations from the expected conditions during the test phase and are then able to optimize the tool based on the real conditions of the setting“, said Ole John, Senior Research Associate at Fraunhofer CML.

## CYBER SAFETY IN THE MARITIME SUPPLY CHAIN NEW RESEARCH PROJECT „MITIGATE“

Our modern information society is depending on functioning and reliable information and communication structures. More and more frequently offenders use this fact for criminal purposes: the damages caused by cyber attacks have been increasing for years.

As the supply chain is also a risk chain, companies are increasingly affected by incidents regarding the information safety of their customers, partners or suppliers and therefore have to face new, cyber-specific challenges.

Based on the growing international linking of companies the topic

of IT safety is gaining in importance, in particular for the ports as interfaces. Although the IT safety plays an important role for the international supply chain, the modern methods of risk management (RM) have not paid a lot of attention to it so far.

Therefore from September of this year, Fraunhofer CML together with eleven partners from research and development, logistics and port administrations from Germany, Austria, Italy, Spain, Great Britain, Greece and Romania, is going to develop the innovative Risk Management System

MITIGATE, which is intended to close this gap.

The core of MITIGATE's RM system is an open simulation environment that can be used to simulate and analyze possible risk scenarios. Furthermore these simulations can help to better predict and therefore avoid hazards in the future. Moreover the system can provide for more transparency in handling risks and hazards.

MITIGATE will be sponsored within the framework of the EU research program „Horizon 2020“ and it has a duration of 30 months.

### IN BRIEF

From June 2 to June 5, 2015 a number of shipping experts met at the international specialist trade show **Nor-Shipping in Oslo** to present and learn about the latest technologies of the industry. Within the framework of this trade show, CML offered a workshop about the topic „MUNIN – Professional insight on unmanned ships“ together with its project partners. The 50 participants of the workshop received a wide scope of information about the research project.

From June 10 to 11, 2015 the project partners reported in detail about the results of the EU project for unmanned ships and gave a number of live presentations of the solutions they had developed to 60 guests at the **MUNIN Final Event in Hamburg**.

More than 900 experts from ports all over the world met in the beginning of June at the **29th World Ports Conference 2015 in Hamburg**. The CML introduced its much-noticed planning environment for sea ports and terminals and demonstrated the three-dimensional implementation of complex planning steps at this event, that was organized by the International Association of Ports and Harbors and HPA. The next venue of the global conference will be Indonesia in 2017.

### + + + DATES + + +

#### • 32nd International Supply Chain Conference

28-30 October 2015, Berlin

#### • Intermodal Europe 2015

17-19 November 2015, Hamburg



IT safety is gaining in importance: the maritime economy is also affected

### IMPRESSUM

Fraunhofer Center for Maritime Logistics and Services CML

a unit of Fraunhofer IML  
Schwarzenbergstraße 95D  
21073 Hamburg, Germany  
Phone: +49 40 428 78-44 51  
Fax: +49 40 428 72-44 52  
info@cml.fraunhofer.de  
www.cml.fraunhofer.de