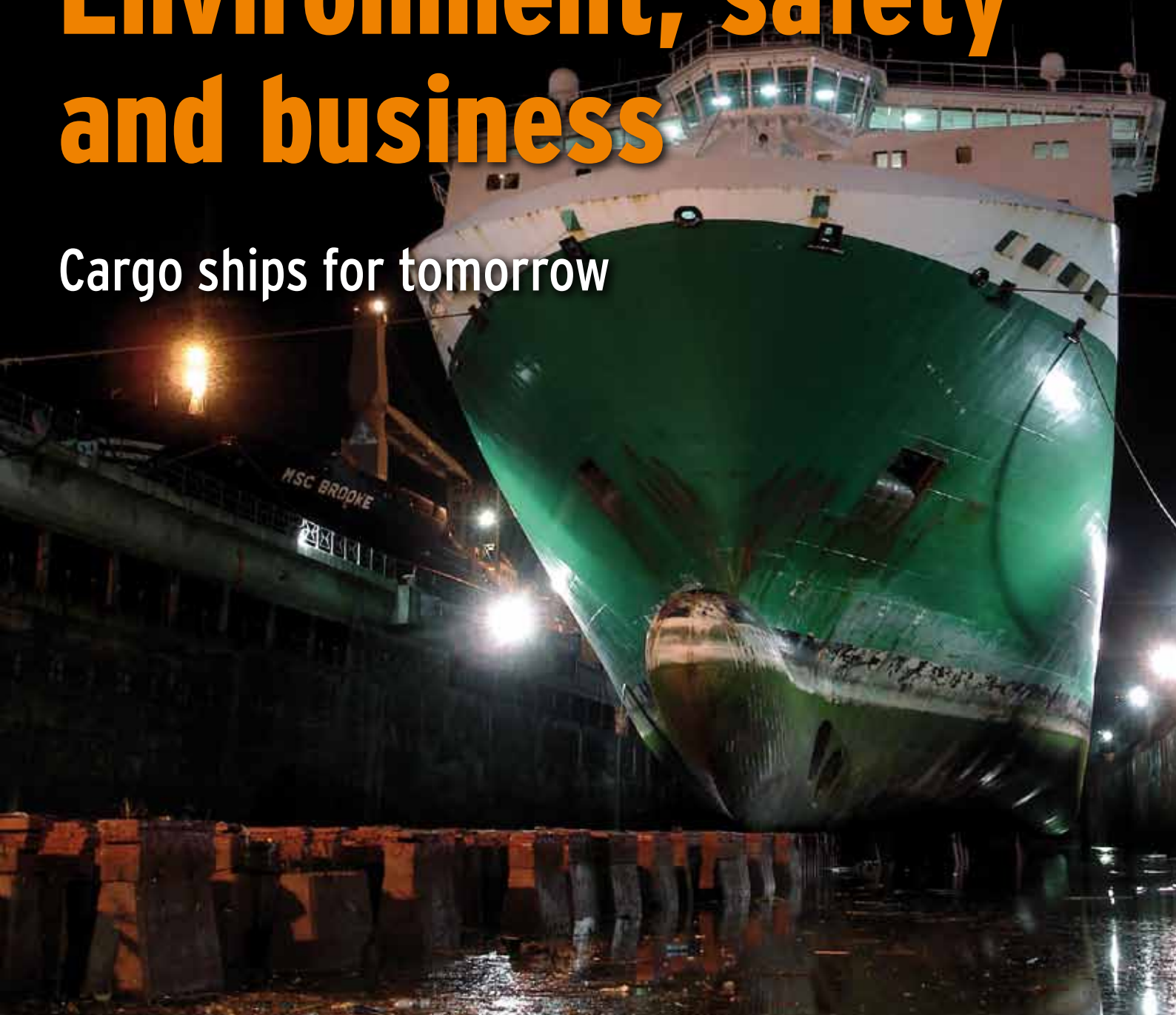


NORTH⁵⁷

The maritime research newsletter from Lighthouse | No 14, 2010

Environment, safety and business

Cargo ships for tomorrow



Report from the third Lighthouse CARGO SHIP theme day

LIGHTHOUSE
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CARGO SHIP

Efficiency and sustainability - challenges and opportunities for shipping

THE THIRD LIGHTHOUSE CARGO SHIP THEME DAY

Emphasis was on environmental, safety, and business challenges for RoRo/RoPax shipping when the Cargo Ship theme day was held on November 18.

“During the Cargo Ship day 2010, we will not only be discussing structural issues but we will also try to combine and extend our knowledge to other Lighthouse theme areas with regard to business, safety, and environment for instance,” said Jonas Ringsberg, head of both Cargo Ship and the Division of Ship Design at Chalmers Department of Shipping and Marine Technology.

Cargo Ship's mission is to provide knowledge and tools for how to shape ships for safe, sustainable and transport-efficient transportations.

“We work mainly with the cargo carrier - the ship - but we must also take into account and interact with the other Lighthouse Ships. We seek cooperation with them and see ourselves as the hub of this research,” continued Ringsberg.

New design challenges

New ship routes put new demands on ship design and logistics solutions. Cargo Ship includes how to design safe ships, arrangements onboard, maritime logistics and functionality. Current research topics also address collision and grounding, damage stability and fatigue analyses.

“Our researchers see that we can contribute to the constant develop-

ment of ships,” said Ringsberg, while he showed futuristic pictures of ships with wind turbines and solar panels. Since Lighthouse started, one licentiate and two doctoral theses have been completed by PhD students working with research issues highly relevant for the Cargo Ship theme area.

Current theses

Four Ph D students from Chalmers Department of Shipping and Marine Technology took the opportunity to present their work. One of them was Martin Kjellberg, who works within the research area seakeeping.

“There is an interest in closing the gaps with more accurate and efficient methods to make predictions about real life situations, that in turn calls for research to generate more knowledge and to develop new experimental and numerical methods. There are probably demands from the academia and the industry for new and more sophisticated methods in the future,” Kjellberg said.

Per Hogström and Martin Schreuder established the fact that ships are not as safe as they could be. To support this statement, Schreuder talked about today's rules and regulations and showed examples of collision events. He



Photo: Katarina Anicic

Jonas Ringsberg talked about the importance of cooperating with all the Lighthouse Ships.

and his colleague Per Hogström have focused on the collision, the hull breach and the stability loss when a collision occurs, and have constructed numerical simulations to calculate the time it takes for a ship to capsize. Hogström showed the Hasard project simulation chain to illustrate this.

“We hope this can make a contribution when rules and regulations are drawn up or revised,” Hogström said.

Zhiyuan Li talked about fatigue routing of container vessels.

“World container shipping is one of the most dynamic economic sectors,” he said. “It is increasing by ten percent every year and the characteristics of modern container ships are developing very fast, but there is a lack of design experience.”

Photo: Markus Christofferesson

Cargo Ship:

Mission: Providing knowledge and tools for how to shape ships for safe, sustainable and transport-efficient transportation

Cargo Ship deals with education and research, with a focus on marine structures, marine transport solutions and their characteristics and roles in the transport chain. Focus is on the ship as a cargo carrier with transport efficiency as the overall driver, considering, among other factors, safety, sustainable development, global welfare and environmental impact.



Slowing down or speeding up?

Johan Woxenius from University of Gothenburg, Professor in Maritime Transport Management and head of Business Ship, spoke about flexibility versus specialization in European short sea shipping and raised several questions: Will there be larger ships? Higher speeds? Will there be simple and slow

vessels for freight? Will there be a return of the fast passenger catamarans?

Henrik Nordhammar is a Naval Architect from Chalmers University of Technology who is now working at Stena Teknik, developing RoPax ships. The difference between RoRos and RoPax ships is basically that RoRo ships are pure cargo ships for rolling load, and

take at most 12 passengers, while the RoPax ships are traditional car ferries. The RoPax takes both rolling cargo and passengers. In 1955, the RoPax was 84 meters long, and could carry nine trucks or 115 cars.

The RoPax grew somewhat in the 60's and 70's, and in 1976, the first double deck model was introduced.

Business Ship

Mission: Providing knowledge and tools for improved and sustainable business practices in the maritime sector.

Multi-disciplinary research from Business Ship at the School of Business, Economics and Law at the University of Gothenburg puts shipping into a wider business context of international trade, logistics, finance, laws and regulation.

Eco Ship

Mission: Providing knowledge and tools for sustainable shipping systems.

Eco Ship focuses on sustainable resource use and minimization of environmental impact from shipping and maritime activities. This encompasses optimization of ship design and propulsion, energy efficiency and energy management at ship level and in the logistics chain as well as the impact of different regulatory tools, international conventions and organizational measures.

Ergo Ship

Mission: Shaping ships for people by providing Human Factors knowledge, methods and tools.

Ergo Ship research concerns evaluation and analysis of work onboard, and the planning and user-centred design of control centres on ships, mainly the ship's bridge and engine control room. We perform research onboard and in simulators. This cross-disciplinary research falls within the Human Factors discipline, bringing together technology, humans and organisational issues and is performed in close cooperation with seafarers and the shipping industry.

Safe Ship

Mission: To establish and promote measures for safe and secure shipping.

Safe Ship uses a systematic approach in order to create a holistic view of safety. Safety in this context is divided into the following areas: regulation and control, organisation, training, ship and equipment design and operations. Each area addresses different activities and functions in the safety chain and can be organized as proactive measures, accident response, and post-accident response. Examples of important research areas are safe navigation; safe maneuvering; damage stability; safe return to port; emergency response; and crisis management. Important tools are case studies, risk analysis, and simulator studies.

In the 80's the trend started with focus on the passengers and "the first true" RoPax with room for 245 passengers was introduced in 1991. Then came the high speed cruise ferries that could carry 1500 passengers. And the ships keep increasing in size and capacity.

"So how big can a ship grow? It might be a good idea to focus on the hull form and fit the cargo into that. Stena is now developing a RoRo focusing on this. We are also testing a new cavity concept," said Nordhammar.

Zero emissions

Carl Fagergren, who has been working both for the Swedish navy and SSPA, is now at Wallenius Marine, who have a ZERO Emission Vision.

"The Orcelle is Wallenius' vision of the future. A ship with no emissions to

the air whatsoever," said Fagergren.

He is currently working on a roadmap towards emission free ships, where energy comes from extractable 'free' power such as wind, sun, and waves.

"It is fully possible to build an emission free ship today! It's not only about new technology but about reducing energy consumption and making use of emission free natural energy sources," said Fagergren. The aim is to use methanol as fuel in 2040. This will reduce the speed from 18 knots to 10 knots in the following 30 years.

This was the third annual Cargo Ship day since Lighthouse's theme area days started. In 2008, lightweight design was the theme and in 2009, focus was on arctic engineering.

Katarina Anicic, Information Officer

From the director

Flying start for 2011



Photo: Jan-Olof Yxell

Anders Marby
Director Lighthouse

- ▶ Meet LIGHTHOUSE at Transportforum in January. The entire transport sector will be gathering at Transportforum in Linköping 12-13 January. Trafikverket, the Swedish Transport Administration, will be presenting the theme "Dare to think a step ahead - so that everyone arrives smoothly, environmentally friendly and safely." Program updates are published every Friday at www.vti.se
- ▶ **Preliminary dates 2011:**
 - Business Ship theme day 24 February
 - Eco Ship theme day 5 May
 - Ergo Ship theme day 16 September
 - Safe Ship theme day 4 oktober
 - Cargo Ship theme day 27 October
- ▶ Find theme day presentations and read about coming events, current projects, LIGHTHOUSE news and information at www.lighthouse.nu

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