

Optimising cargo stowage

Digital data capture, integrated solutions and AI based decision support

Charting the Course for Sustainability - Baltic Sea region as a front-runner in clean shipping and shipbuilding

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Oscar Grossmann

Kockumation

Mads Bentzen Billesø

DFDS

What?

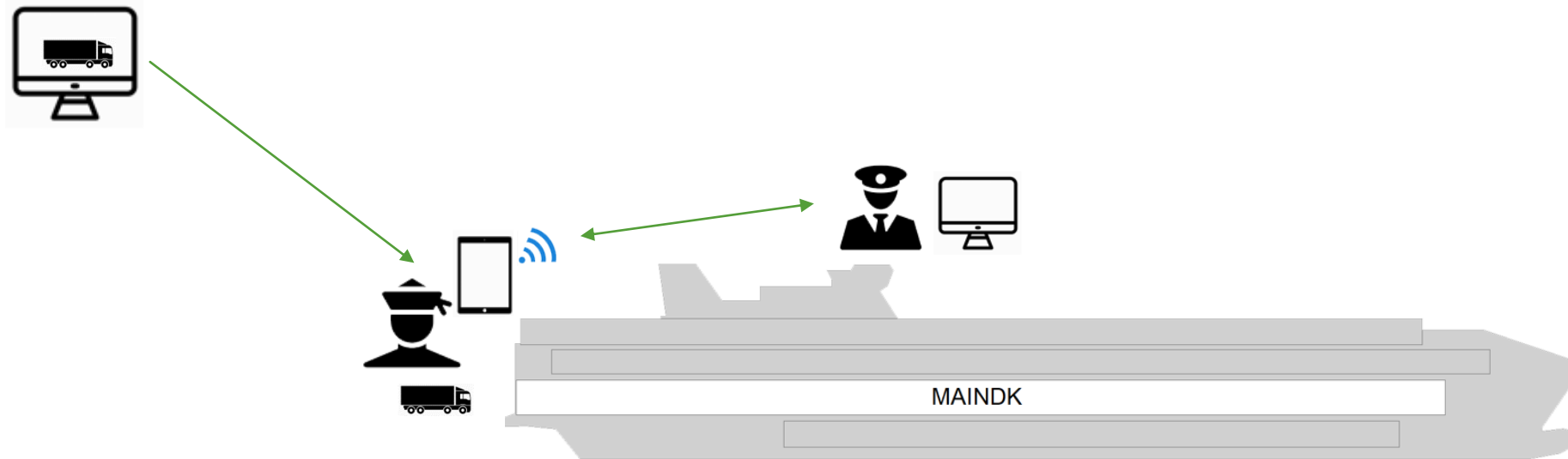
► How could one:

- Increase the efficiency when it come to planning a departure for RoRo-vessels?
- Reduce the turn around time in port?
- Use the stability characteristics to lower the overall fuel consumption during a voyage?

Why?

- ▶ Digitalizing the planning process
 - Transparent information flow
 - Increase the awareness of the crew
 - Flow of units

Digitalization of RoRo Planning

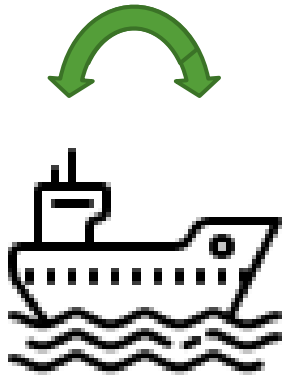


Why?

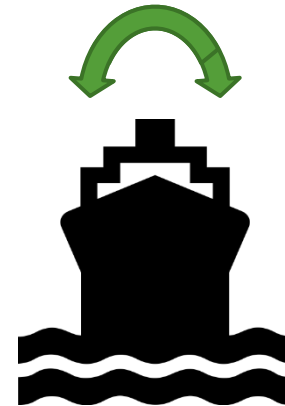
- ▶ Digitalizing the planning process
 - Transparent information flow
 - Increase the awareness of the crew
 - Flow of units
- ▶ Dual-cycling
 - Optimizing the use of the tugs
 - Less the time spent in port
 - Reduce sailing speeds
- ▶ Stability characteristics
 - Floating position

Floating position

Trim



Heel



How?

- ▶ What was our approach in solving the challenge?
 - Tablet based application
 - Increase awareness by portability
 - Increase accuracy when it comes to loading a vessel in the stability program
 - Live feedback of stability parameters of the vessel while loading
 - Live booking data from the terminal system
- ▶ DFDS
 - Booking information
 - Daily operations
- ▶ AAU, SDU, DTU

Booking list



☰ Load cargo

Voyage: dummy_voyage_id
Departure date: 2025-04-27



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Cargos

Registration number	POL	POD	Length	Weight	Loaded ↑	Discharged
ASD 123			13.62 m	19 mT		
WOA 739			14 m	60 mT		
XQR 510			13.62 m	17 mT		
XTF 435			13.62 m	40 mT		
ACR 038			13.62 m	17 mT	✓	
BIJ 763			13.62 m	15 mT	✓	✓
BXT 330			13.62 m	12 mT	✓	✓
DOT 939			12.19 m	38 mT	✓	
DUQ 521			13.62 m	10 mT	✓	✓
DUQ 522			13.62 m	23 mT	✓	✓
GAG 801			13.62 m	15 mT	✓	
HEC 869			13.62 m	30 mT	✓	✓
IAH 239			13.62 m	13 mT	✓	✓
KLV 079			13.62 m	19 mT	▲	

Placement of a cargo unit



☰ Load cargo

Voyage: dummy_voyage_id
Departure date: 2025-04-27



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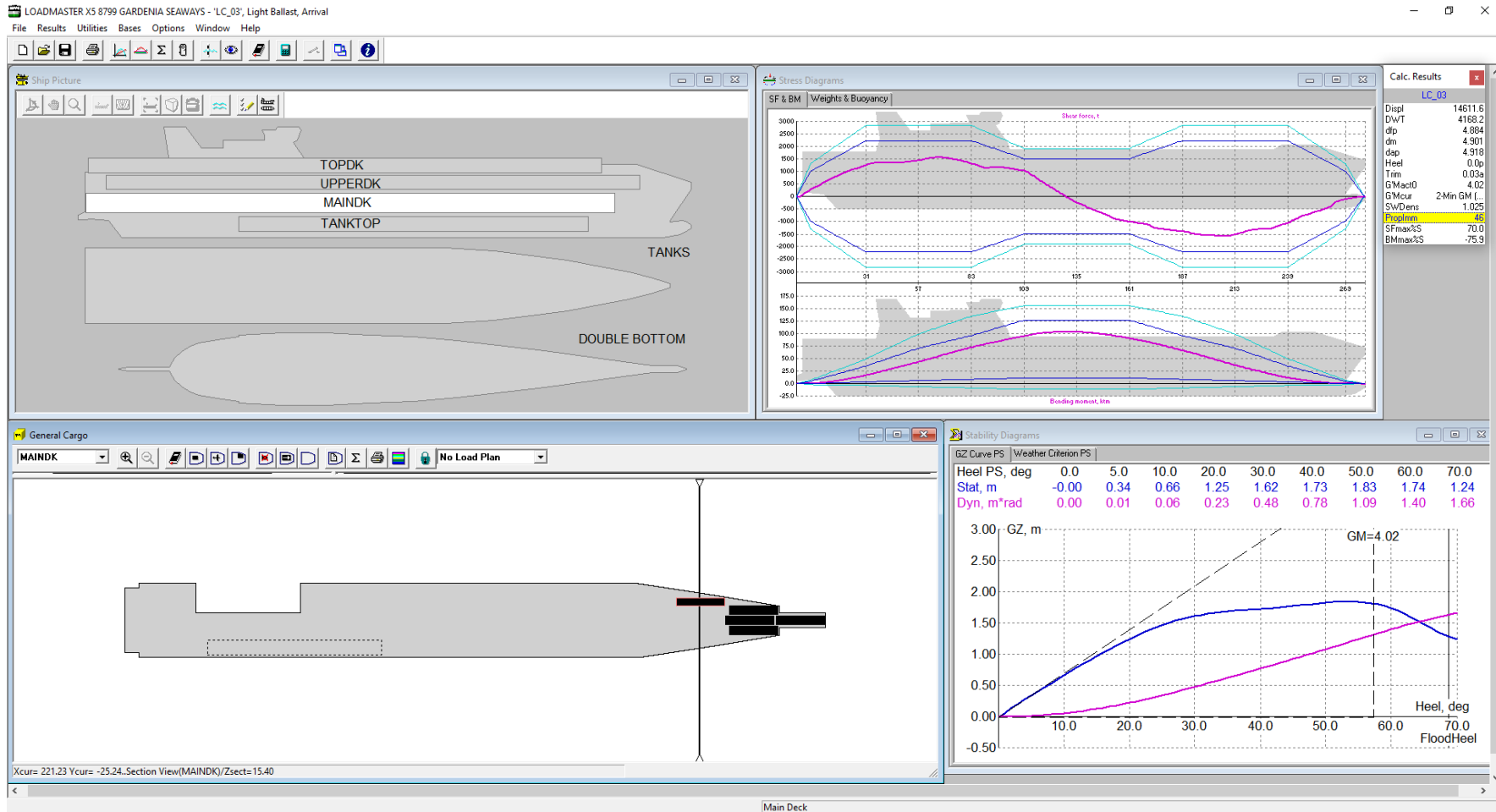
Cargo ASD 123 Edit cargo Main Deck

Lane MD06 Frame 220 ↻

0 20 40 60 80 100 120 140 160 180 200 220 240 260 280

← CANCEL CONFIRM

Loading computer interface



Stability information presented



☰ Move cargo

Voyage: dummy_voyage_id
Departure date: 2025-04-27



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Search cargo

Lane - Frame -

Voyage

Loaded	25/29
Shifting	1
Discharged	19

Deck usage

	Free space	Used space	Cargo weight
Weather Deck	1165 m	0 m	0 t
Upper Deck	1098 m	0 m	0 t
Main Deck	905 m	70 m	105 t
Tank Deck	550 m	0 m	0 t

Stability

Displacement	26381	mT
Deadweight	12981,3	mT
Draft at MS	7,175	m
Trim	0,27	m Aft
Heel	0,3	° Port

The solution/findings?

- ▶ Deckmaster
 - Tested internally
 - Live demo at the harbor of Gothenburg - Ficaria Seaways
 - Discussed the solution with our project partners
- ▶ Our findings and recommendations from the live demo
 - Positive feedback from the crew onboard
 - Awareness
 - Heads-up when it comes to heavy cargo objects
 - Specific placement onboard
 - Additional features could lead to better safety onboard
 - Difficult to plan because of arrival times of cargo units

Live demo



Live demo



Live demo



Relevance?

- ▶ AI Prediction of amount of cargo that will arrive
- ▶ AI Planned Loading based on booked cargo and vessel
- ▶ Reducing the environmental foot print of each journey
- ▶ Our tool cannot only be used as a planning tool but also as a monitoring tool while loading. To be able to monitor a loading operation will be crucial when we are moving towards autonomous tugs and vessels

Thank you!

Oscar Grossmann

Kockumation

Oscar.Grossmann@kockumation.com

EXOPRODIGI lead partner:

University of Turku

Ms. Elisa Aro, Research Manager

elisa.aro@utu.fi | tel: +358 50 505 8741



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