



Digital Ship
MARITIME DIGITAL
TRANSFORMATION FORUM

COPENHAGEN
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DFDS CASE STUDIES: THE VAST POTENTIAL OF ADVANCED TECHNOLOGIES IN THE MARITIME INDUSTRY

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AN INTEGRATED PART OF EUROPE'S INFRASTRUCTURE

8.000 employees

9.000 trailers

60 vessels

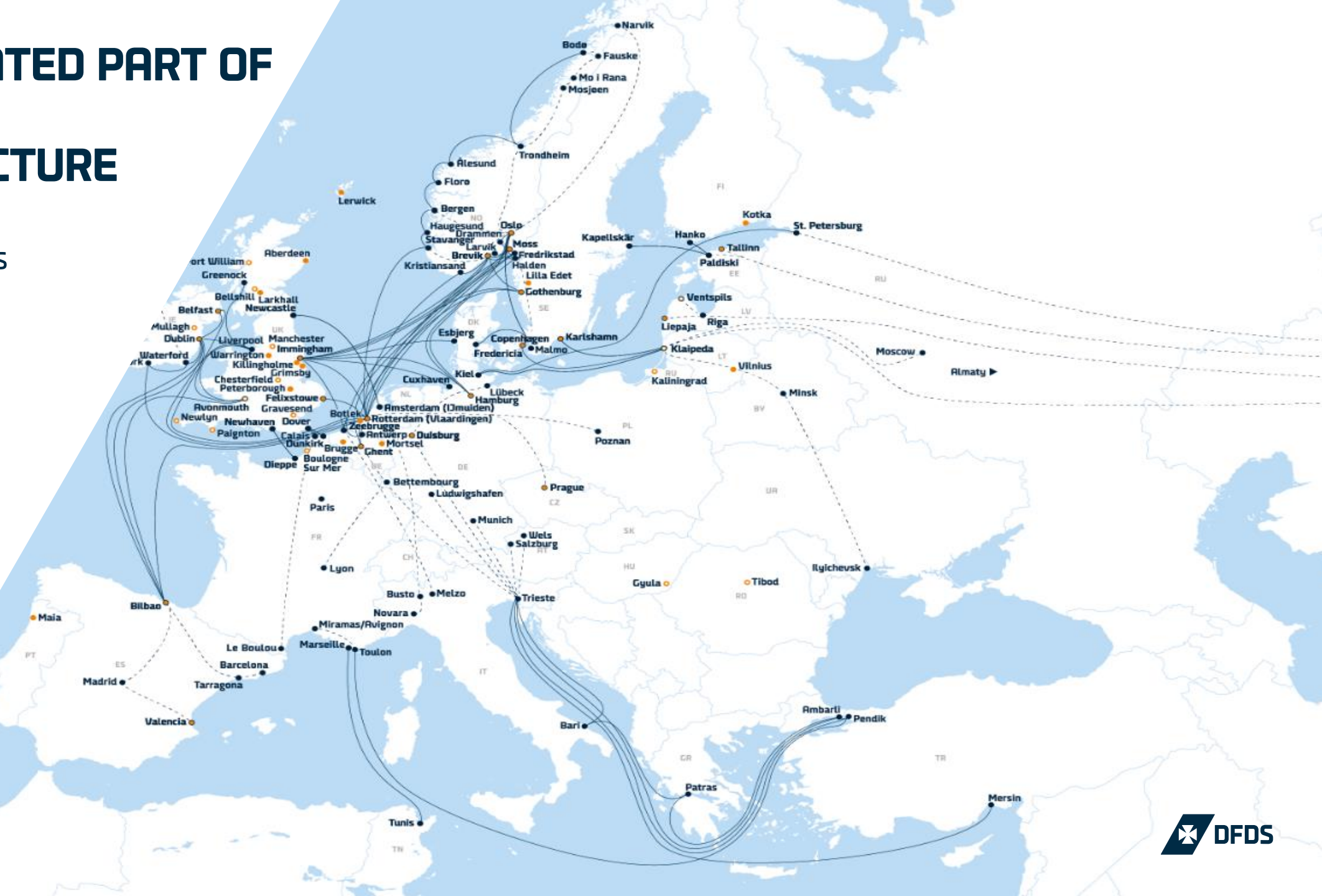
8 terminals

40.000 voyages

3 mio. units

moved

2018



Strategy



To stay relevant we need to develop and grow with our customers.

- Decarbonization
- Automation
 - ships, trucks and terminals



Biofuel – development-production-consumption

Sea News

GALILEO
MARITIME ACADEMY



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Shipping Cruise Energy Environment Fuel News Making Waves

DFDS Invests in Biofuel Developer Mash Energy

By Baibhav Mishra - April 26, 2019

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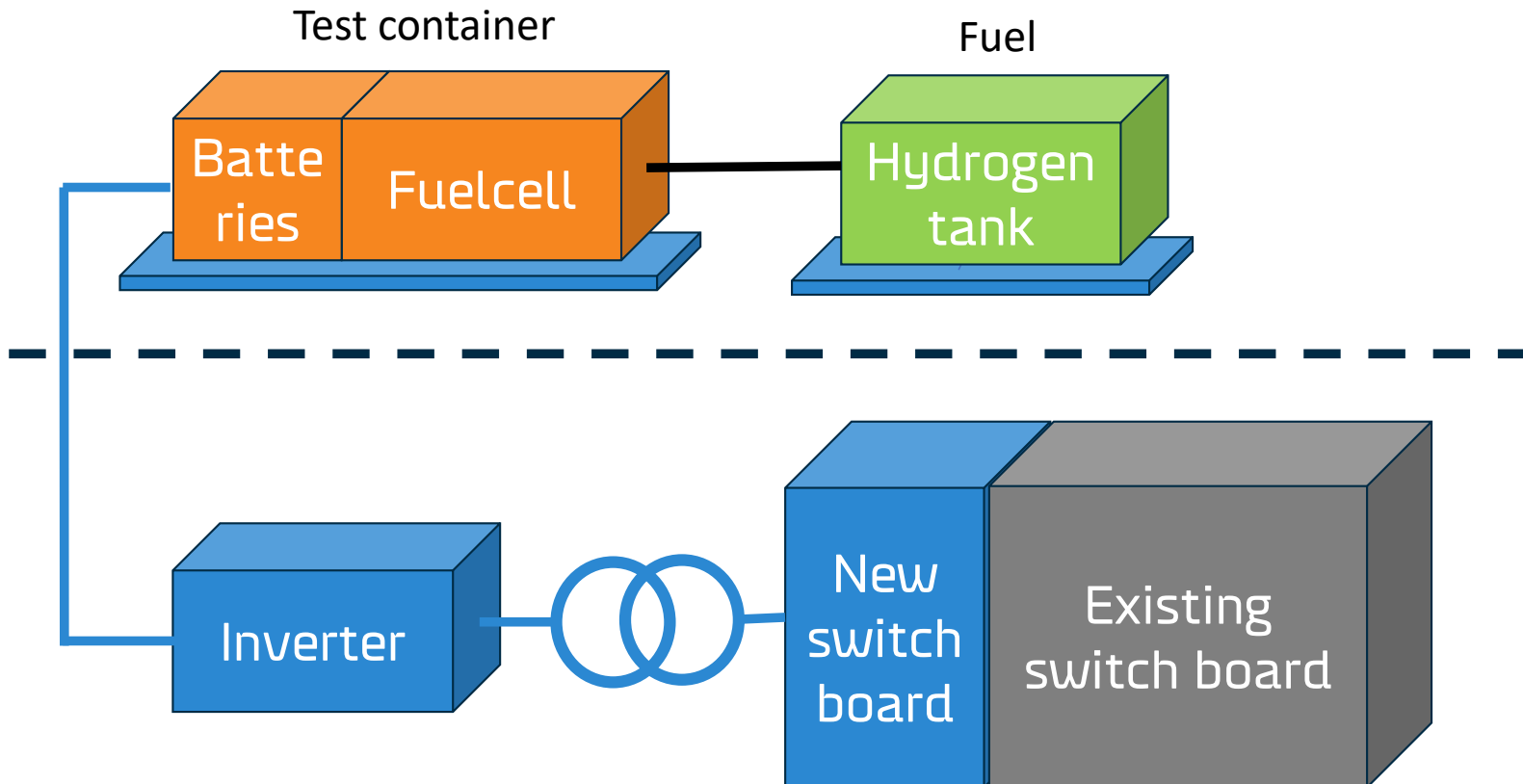
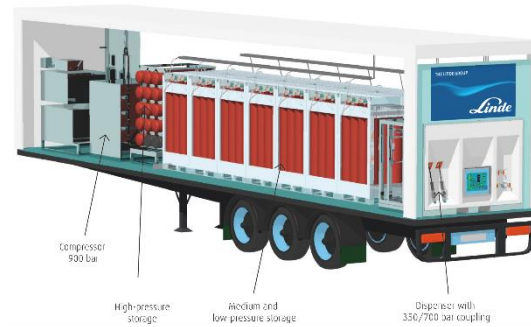
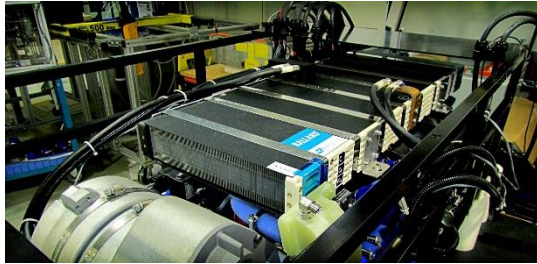


(Image Courtesy: DFDS)

DFDS is investing in the start-up company MASH Energy ApS that produces biofuel from agricultural waste, currently from the by-products of nut processing in Tanzania and India.



Fuel cell test vessel



Weather deck

Engine room

Autonomous vessels / Highly Automated vessels (ShippingLab project)

Autodocking

Fast, safe and energy efficient arrival and departure from port

Periodically unmanned bridge

1) Automated lookout

2) Navigator may leave bridge to rest or perform other tasks

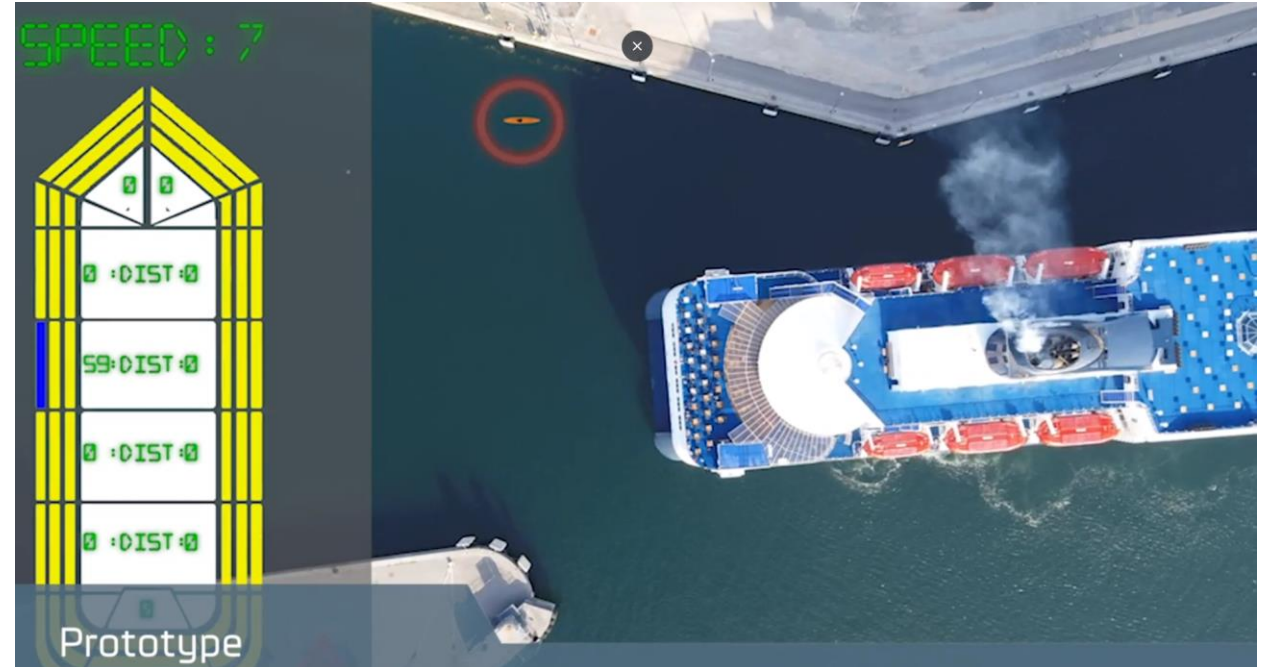
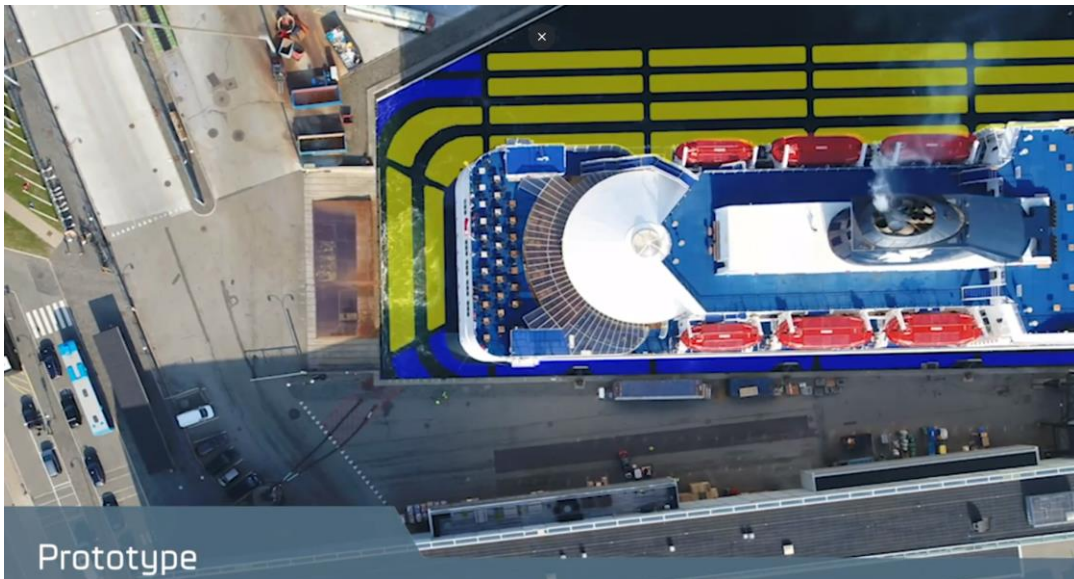
Advanced decision support

Sensors and automation provide navigator with additional input, e.g. lookout and anti-collision guidance and improved services from shore.

On board drone



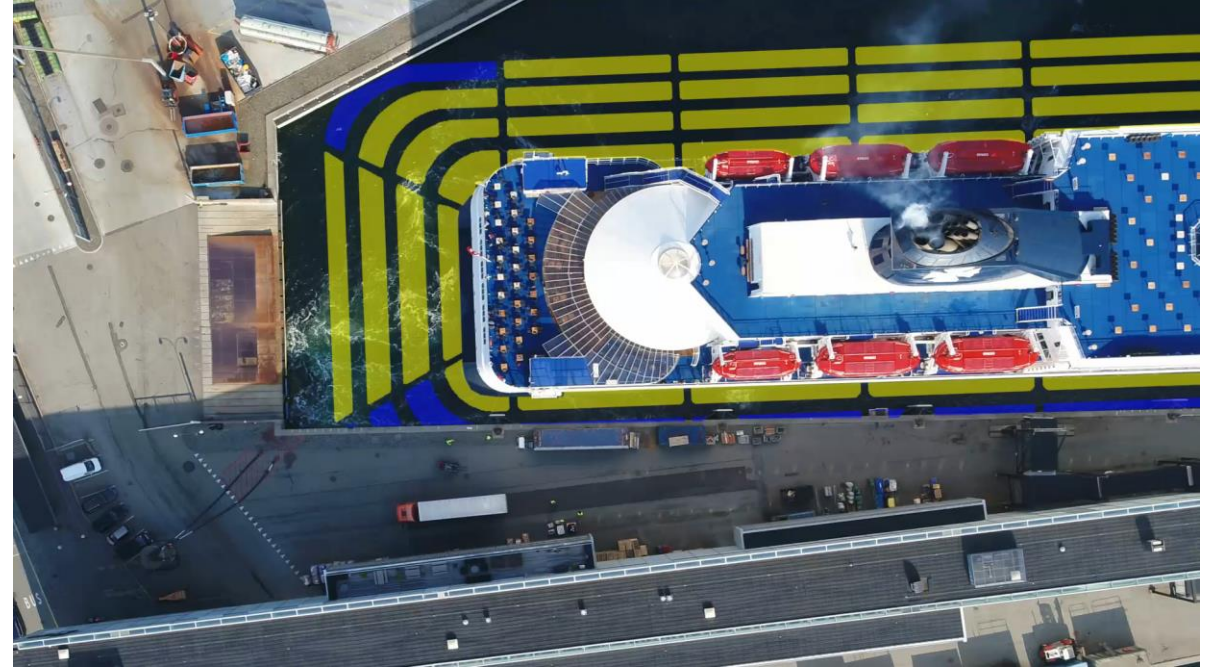
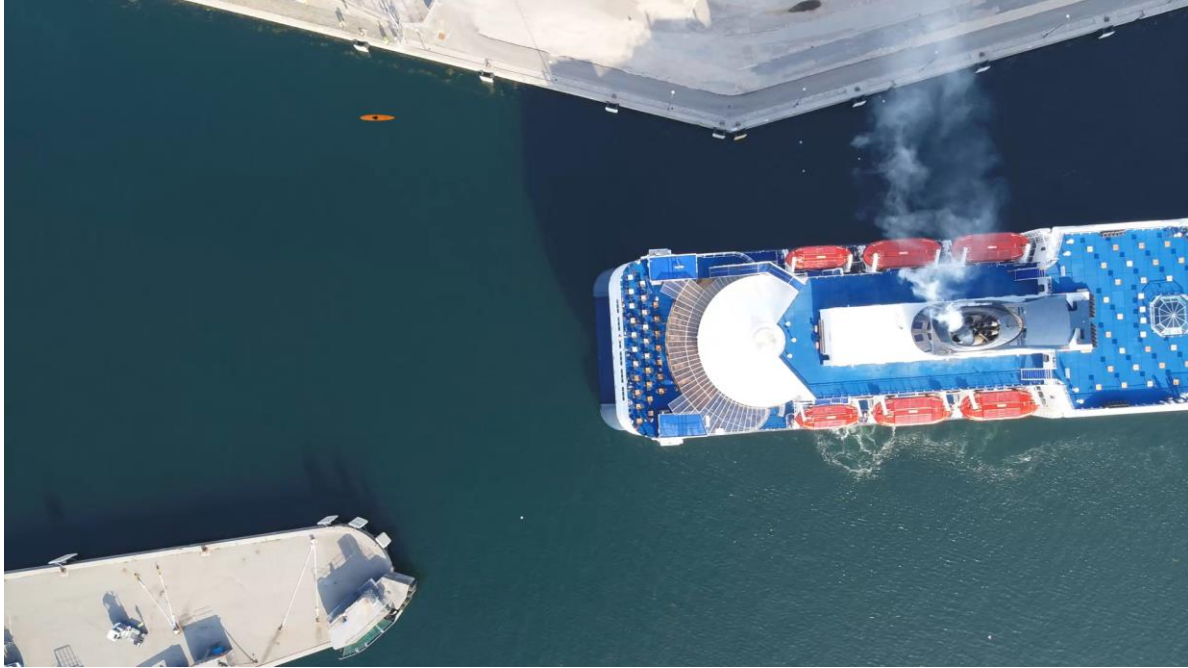
Project developing on board autonomous drone system – autonomous charging, ruggedized drone for secure operation in harsh maritime environment with long service intervals, docking support service providing realtime video with augmented reality for Captain and navigators.



The drone will be able to perform a variety of different tasks, that all add to the value proposition of the drone; man-overboard, fire detection and fire management, pirate attack early warning, support autonomous ship operation, etc.



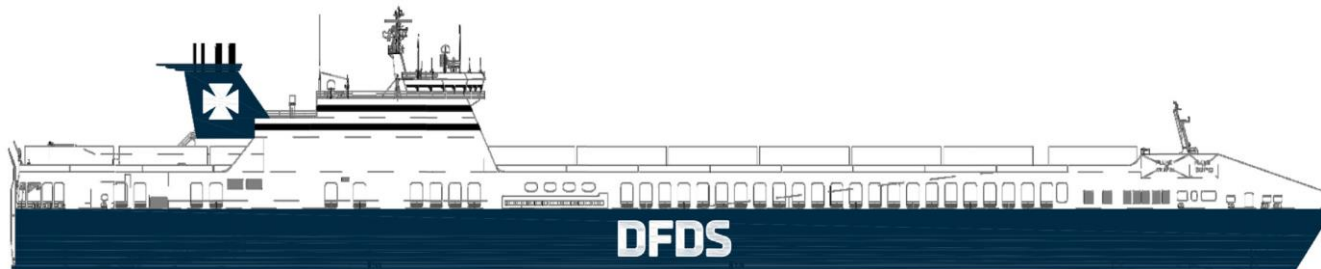
On board drone



Newbuilding projects

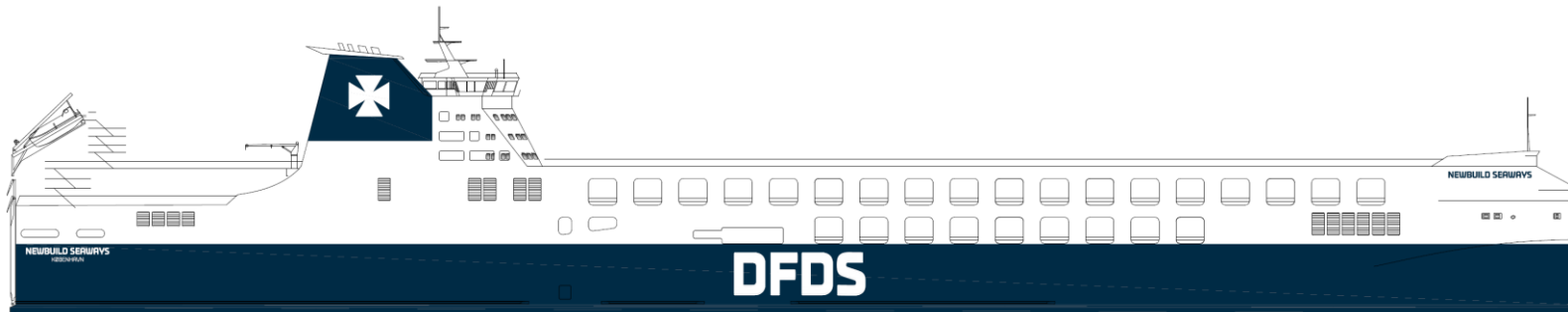
Economy of scale / sustainability in scale

- **GARDENIA & TULIPA SEAWAYS** (4,100 tm Ro-Ro) delivered in 2017



- 210 x 26 m
- 4 cargo decks
- 262 trailers
- 21.3 kn.
- 19,200 kW

- **6 x 6,700 tm Ro-Ro** entering into service in 2019-2020



- 235 x 33 m
- 5 cargo decks
- 450 trailers
- 21.0 kn.
- 23,600 kW

Road and terminals – optimizing cargo flows

Real time tracking cargo units or arrival times



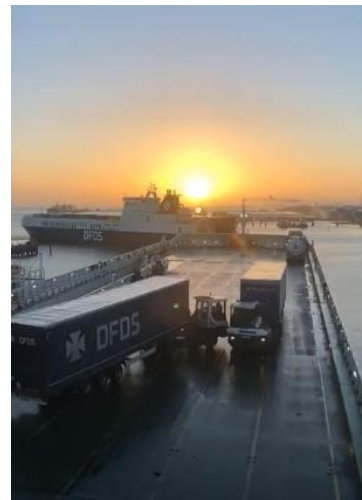
Smart Gate validates cargo ID, weight, dimensions and damages



Cargo location and condition is tracked in terminal



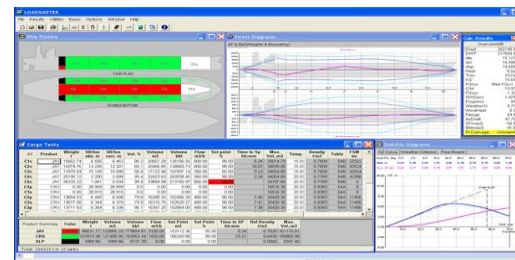
Efficient loading process reduces turn-around time



Cargo position data enables precise information on arrival time to customers



Advanced planning of port and vessel operations and optimal stowage with reduced ballast intake



Optimization of cargo operations - Dual cycling



A simple example of single cycling vs dual cycling

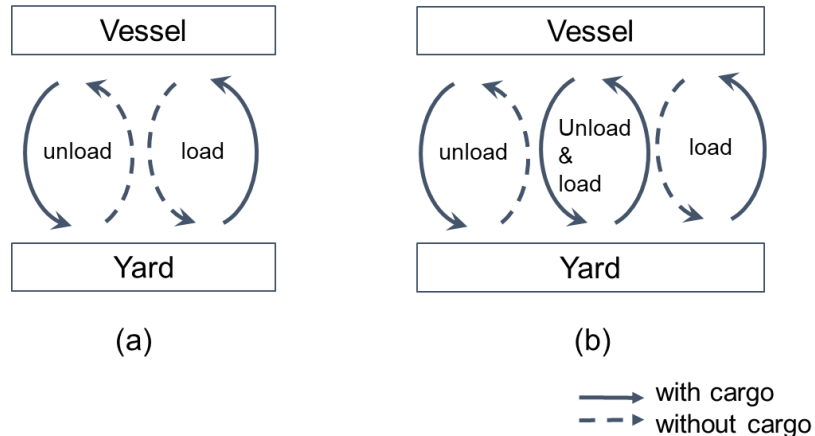
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1	4	9	15	21	27	33	39	45	51
2	5	10	16	22	28	34	40	46	52
	6	11	17	23	29	35	41	47	53
		12	18	24	30	36	42	48	54

An example of a deck with 54 trailer slots, fully loaded.
All jobs are unit length and operated by 2 tugs

Single cycling : $54+54 = 108$

Dual cycling : 64

Time saved $108-64 = 44$



Drones supporting terminal logistics

A project developing drone and vision technology to increase terminal operation efficiency.

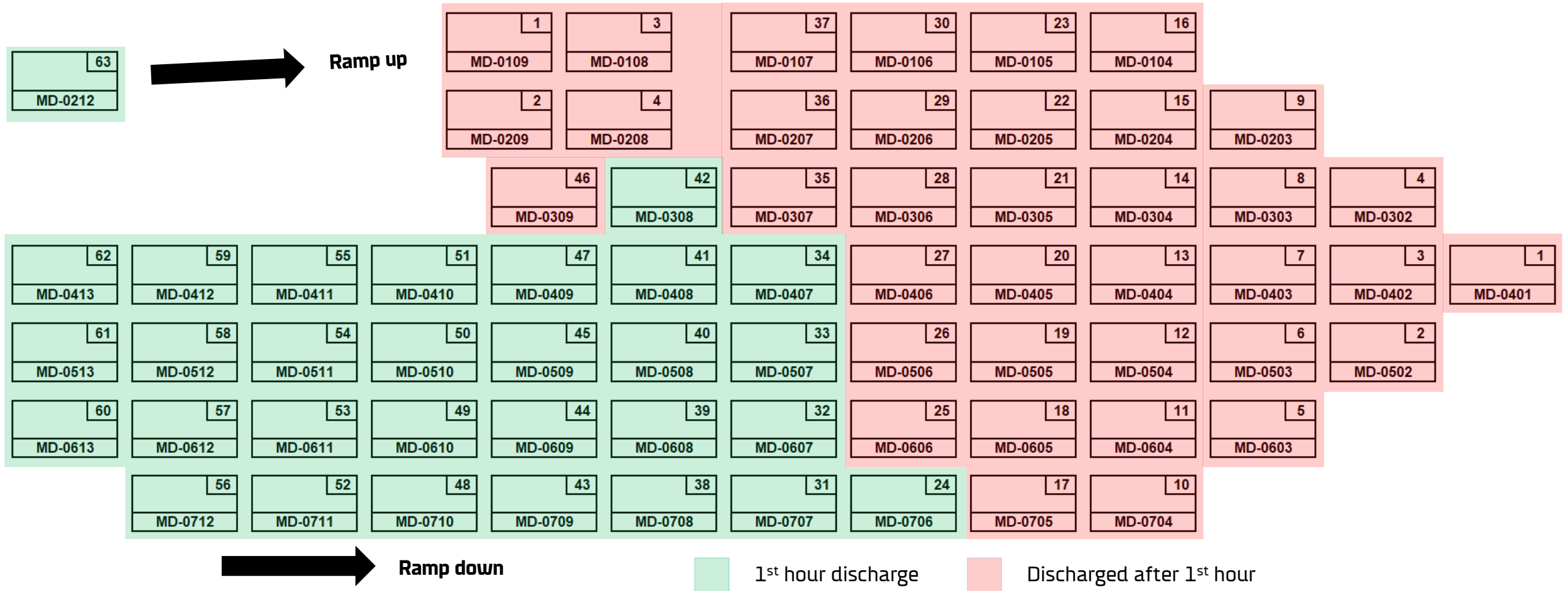
Drones with intelligent processing autonomously locates trailers, run security checks (clandestines, etc), inspect for cargo damage and maps space utilization.

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Optimization – forecasting discharge times

Main Deck



THANK YOU

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