PROACTIVE VS. REACTIVE – WAS VIKING SKY A FORESEEABLE EVENT?

HOW CAN A SMALL SHIP OWNER BUILD SYSTEMS FOR A SAFE AND EFFICIENT FLEET WITHOUT LARGE OVERHEAD

Jörgen Strandberg, Wärtsilä

WÄRTSILÄ

All the opinion are these of the author alone…

How predictable are accidents or incidents?

Erika
Costa Concordia
Faros
Viking Sky

Should the shore management be more involved?

What has happened in shipping in the last 20 years?

Nothing!

Ships have become larger, and with that also the demand on ports and fairways

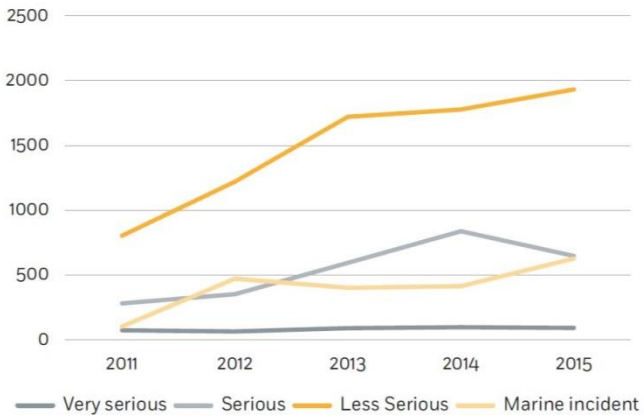
We have the same principal eco system!

We are a low value member of the transportation and logistics

We have the same accident rate!

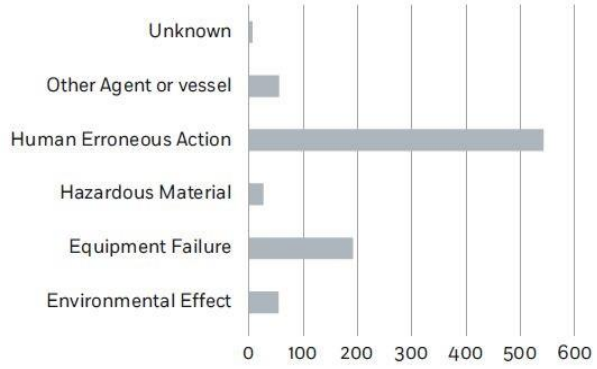
According to the latest EMSA report, the accident rate is fairly static

Figure 2: Number of marine casualties and incidents per severity



2.5.1 ACCIDENTAL EVENTS

Figure 21: Distribution of accidental events 2011-2015



While accounting knows about every dollar and cents across the company…

Nobody knows the true operational sweets spots or asset health across the fleet

LACK OF OPTIMIZATION

A daily noon report based on manual input is accepted for performance comparison

Any knowledge is kept in the head of the SI and CE

Preventing best practice to be shared across fleet

TRADITIONAL ECO SYSTEM

- Charterer
- Ship Manager
- Ship Owner
- Bank
- Shipyard

Competition is only with other shipping companies

Overall poor service moves freight to rail, road and air

Shipmanagement has been commoditized

LACK OF BUSINESS DEVELOPMENT

Financial control instead of technology

Economy of scale is seen as the only viable opportunity

Shortsighted cost savings targeting crew and maintenance

Market does not rewards quality due to oversupply of ship

TRADITIONAL ECO SYSTEM

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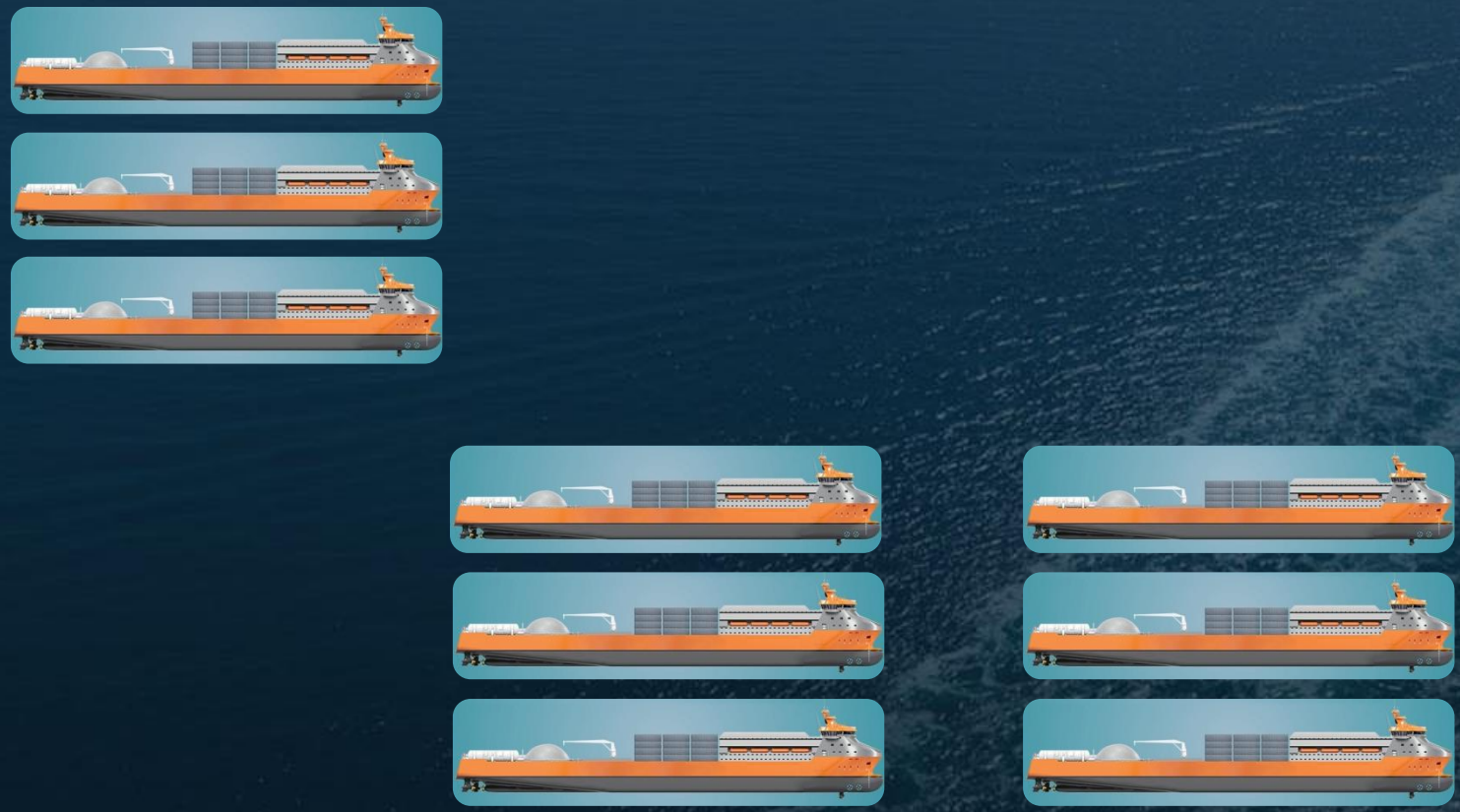
Technical structure – Lack of ”Best practice”



- Charterer
- **Ship Manager**
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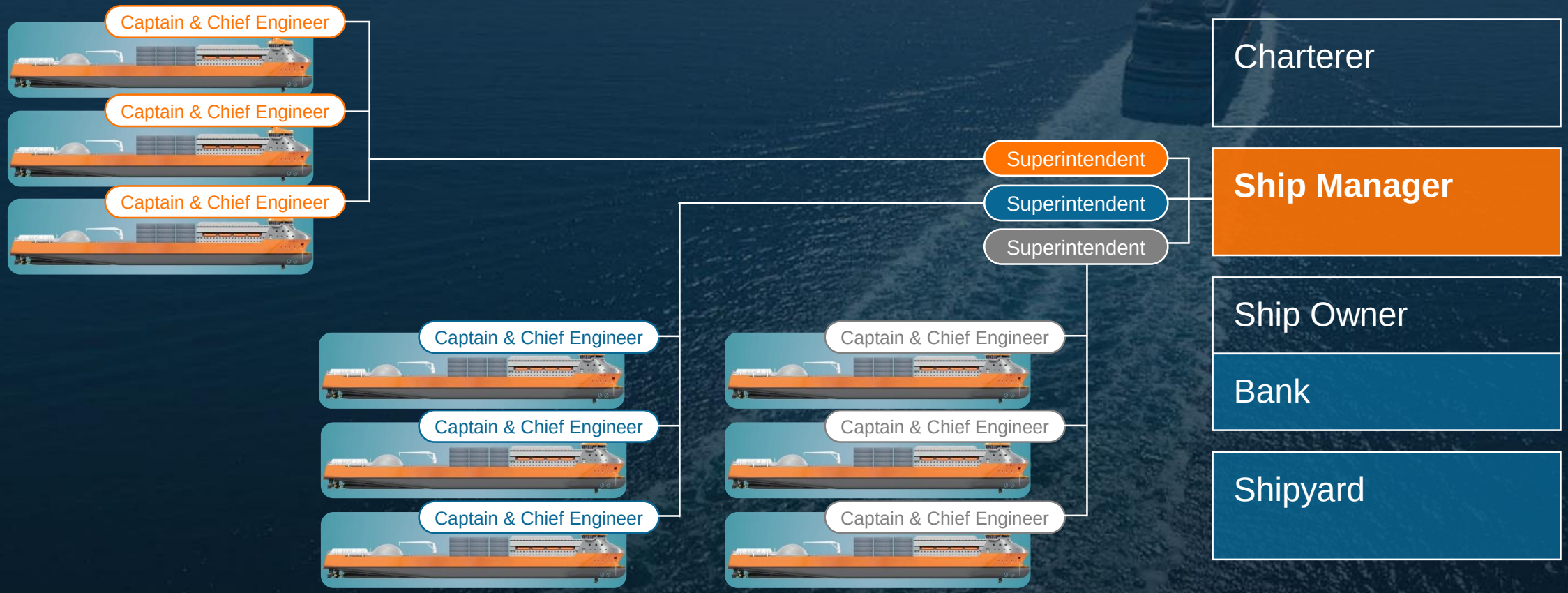
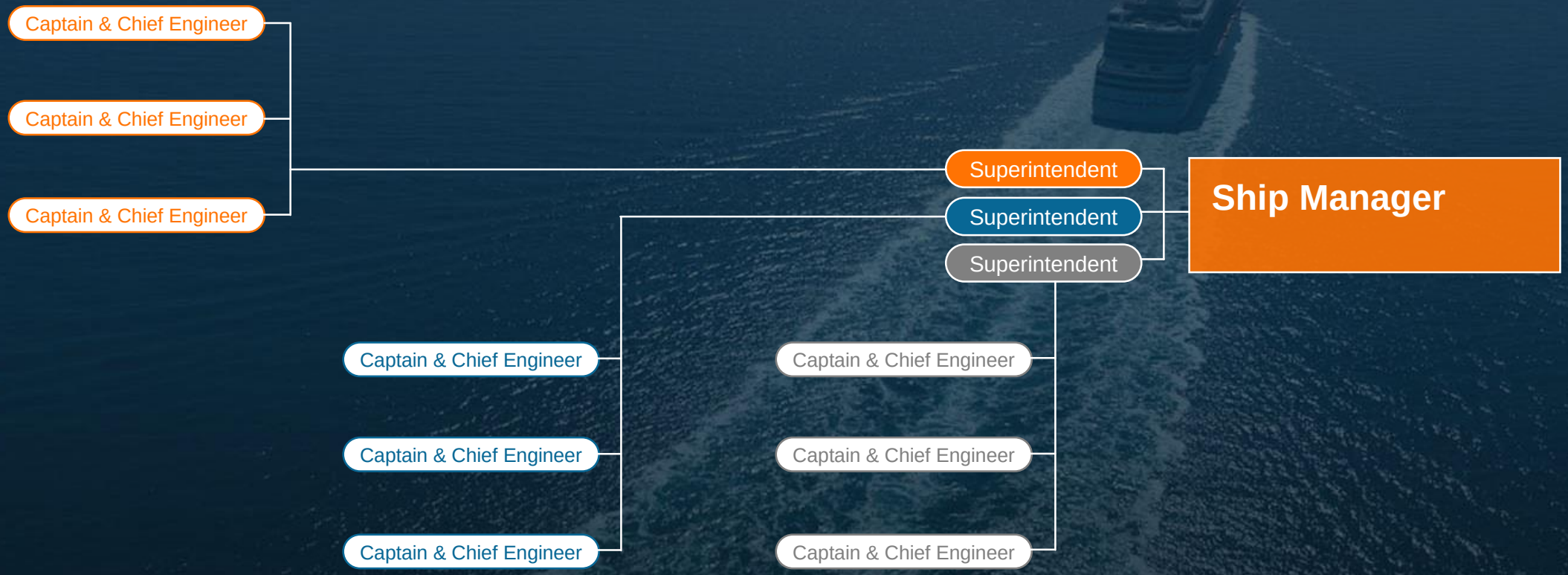
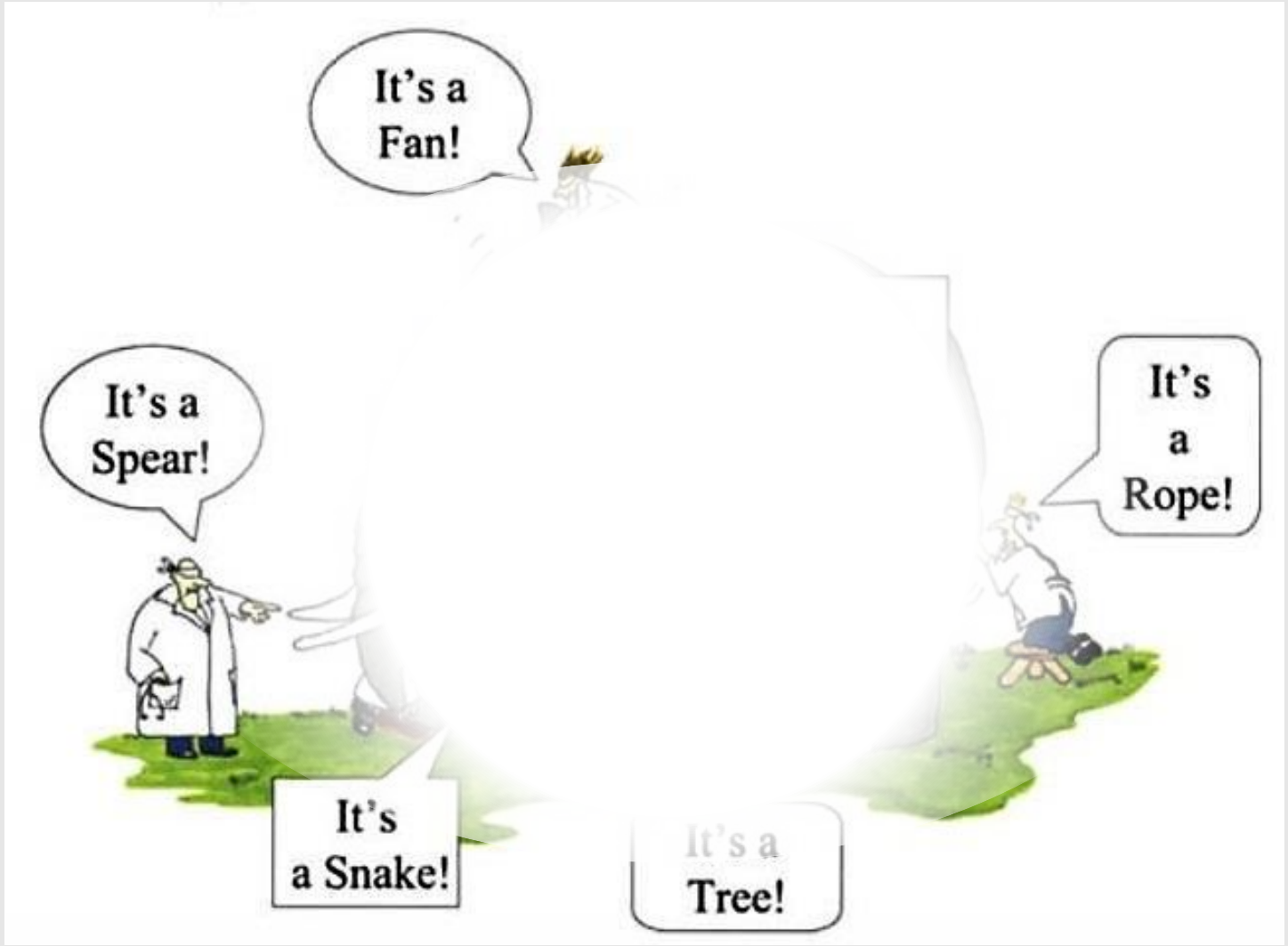
Technical structure – Lack of ”Best practice”



Technical structure – information ”silos”



POOR DEPTH OF ANALYIS –
POOR OVERVIEW



- Charterer
- **Ship Manager**
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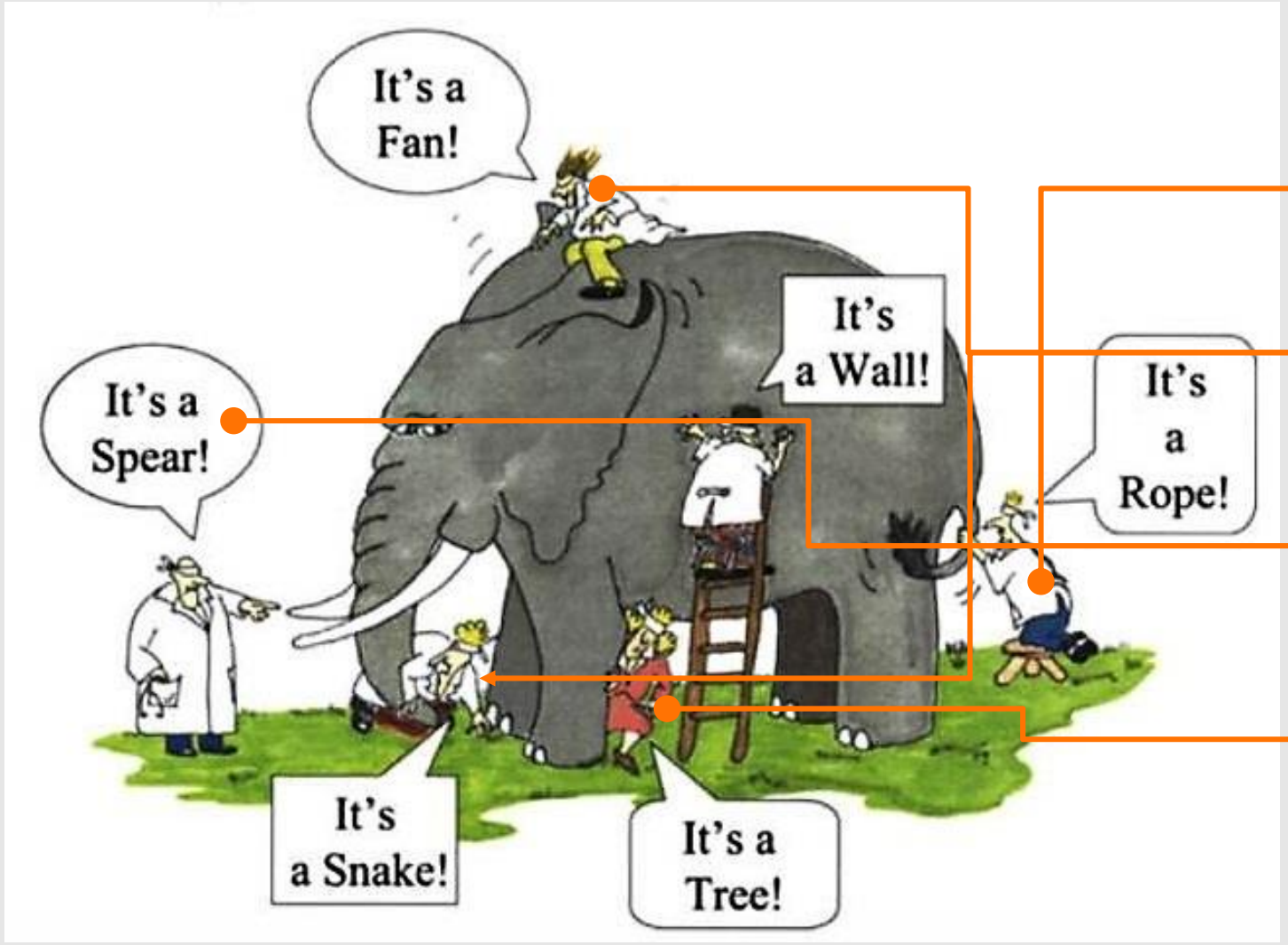
POOR INCENTIVES FOR COST-SHARING



- Charterer
- **Ship Manager**
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ACCORDING TO THE OECD;

improve productivity

create new business opportunities and new jobs

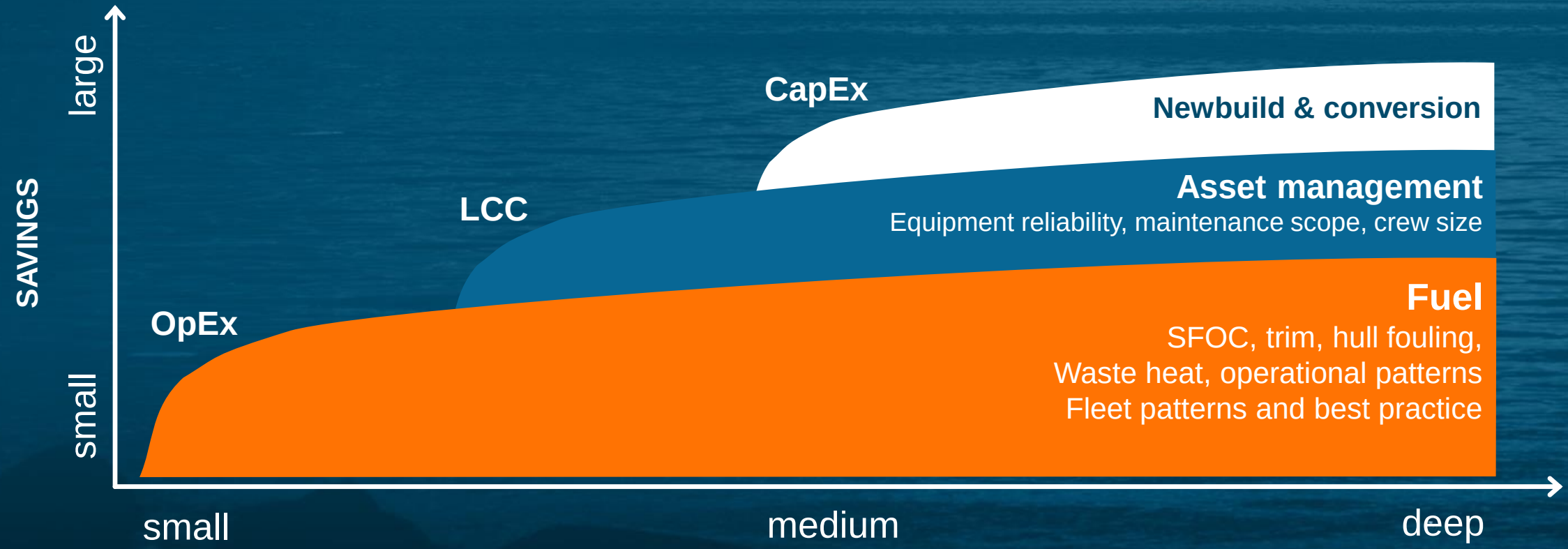
"ADVANCES IN DIGITAL TECHNOLOGIES ARE EMBEDDED IN ALL SECTORS OF THE ECONOMY AND CONTRIBUTE TO:"

reduce costs

change business processes

Reach new markets

BENEFITS OF DIGITALIZATION



Smart Marine
In essence

SMART MARINE VISION

WÄRTSILÄ VISION

THREE BUILDING BLOCKS

ASSET MANAGEMENT

Connect as many installations as possible, leverage data to optimize the asset performance throughout the asset life cycle, and convert this to value added services

PERFECT THE CORE

Superior and vast product portfolio and lifecycle customer services

VOYAGE MANAGEMENT

Develop the Intelligent Vessel of the future, connect it to the Smart Ports, optimize the voyage from berth to berth to address the waste of the marine supply chain

DATA

WÄRTSILÄ

Measure Operational Profile today compared to the situation yesterday to project the risk of tomorrow

NAVIGATIONAL QUALITY
QUANTIFY NAVIGATION EXECUTION BETWEEN ACTUAL AND EXPECTED BEHAVIORS

SYSTEMS HEALTH
GAUGE MARGINS BETWEEN DESIGN CAPABILITY, SYSTEMS AVAILABILITY AND OPERATIONAL REQUIREMENTS

HUMAN FACTORS
HELPING TO PRIORITIZE TRAINING OPPORTUNITIES AND PRECISE RESOURCE ALLOCATIONS

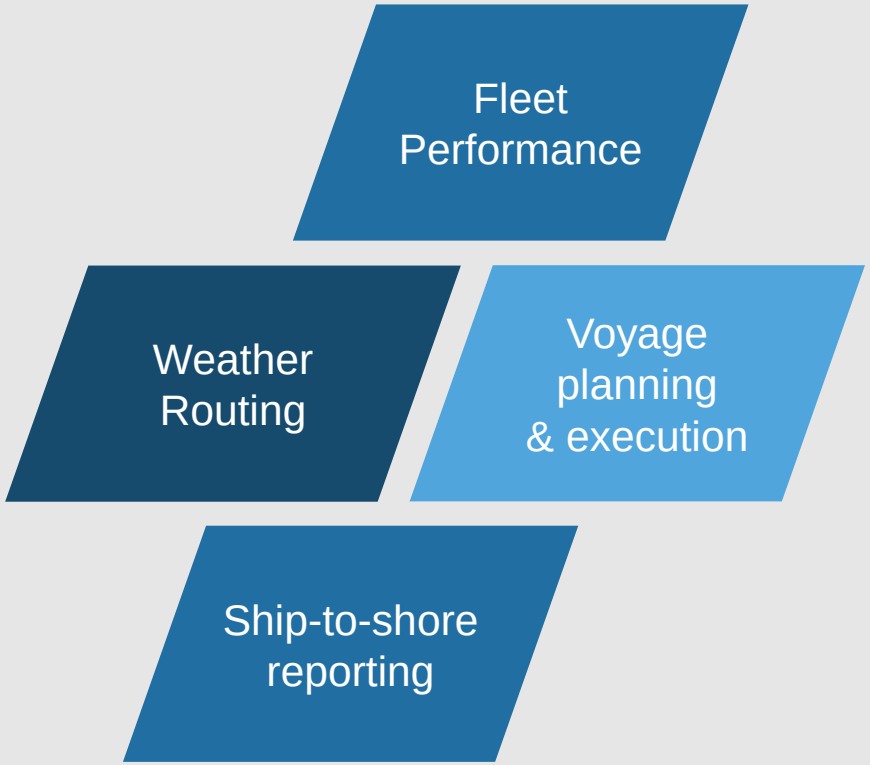
REGIONAL AND WEATHER
HOW IS THE ENVIRONMENT AFFECTING BOTH ASSETS AND OPERATIONS

DATA IMMERSION
SITUATIONAL AWARENESS BY ANIMATING HIGH DENSITY DATA TO PUT CONTEXT TO NUMBERS

Developing an Operational Risk Index (ORI) to focus on the most effective efforts

FLEET OPERATIONS SOLUTIONS

We provide the first solution to shipping that puts fragmented services under one umbrella to lift synergies and improve operational processes



Unique benefits

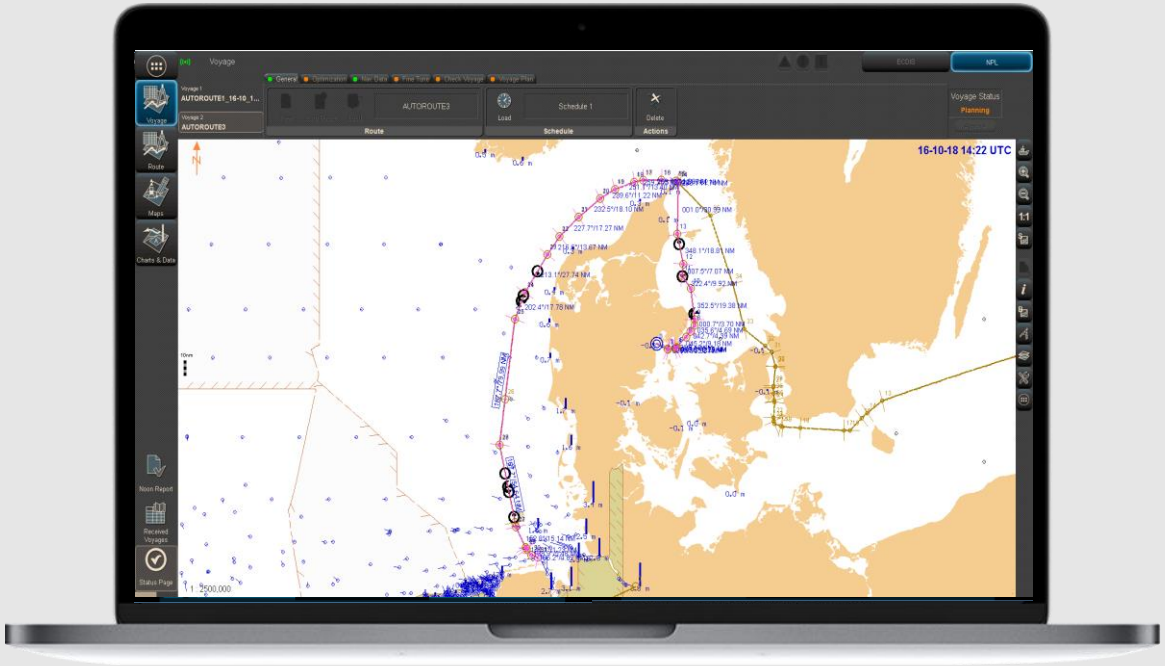
- Route planning happens on latest nautical charts resulting in a route always safe to sail
- Build in weather optimization to find safe and most fuel efficient route
- Data and charts are automatically delivered, no ordering, no USB
- SmartLog allows ship-to-shore reporting with most data already pre-filled
- A mobile tablet on board is used for SmartLog and „Take me home“ ECDIS backup
- Real time vessel and fleet tracking (no AIS holes)
- Advanced Eniram fuel efficiency algorithms to spot more difficult saving levers

Increasing both safety and efficiency with the same solution.

ROUTE PLANNING STATION

Manual effort of onboard voyage planning process is reduced while office has transparency of what is going on

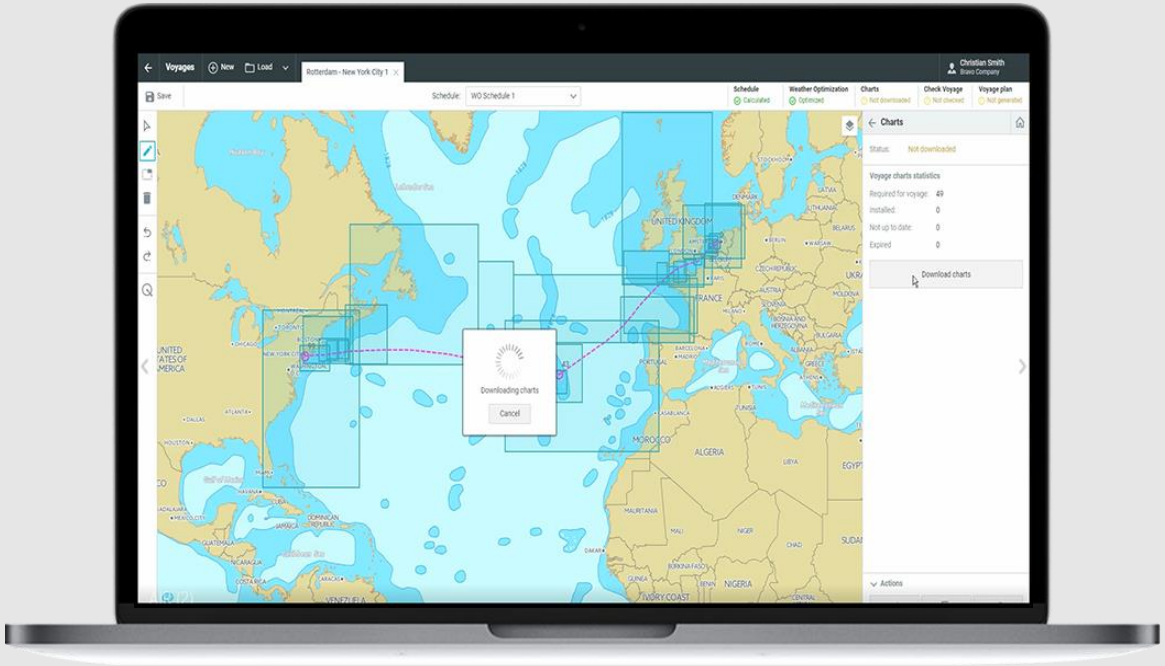
Time for planning decreases from 4-5h to 30min!



- Voyage planning is automatically done on up-to-date nautical charts, so the computer gives a draft route which is safe to sail
- Route is then weather optimized – further improving safety and fuel efficiency of the route
- All needed (and only the needed) charts are automatically downloaded and put along the route
- Flexible, fast and user-friendly route manual correction tools
- Voyage plan is automatically created

CHARTS, PUBLICATIONS AND DATA

Automatic data delivery keeps charts and planning tools updated and therefore compliant



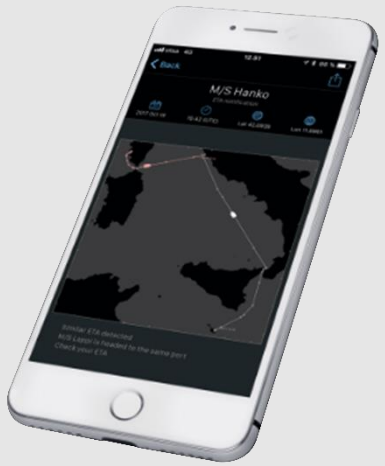
- Relevant information is always available on the bridge
- Easiest possible way to receive official charts and data for the voyage
- All charts and publications are part of the package and are paid with the same invoice
  - TADS/AVCS ENCs
  - ENP
  - ADP
  - IMO
  - Weather

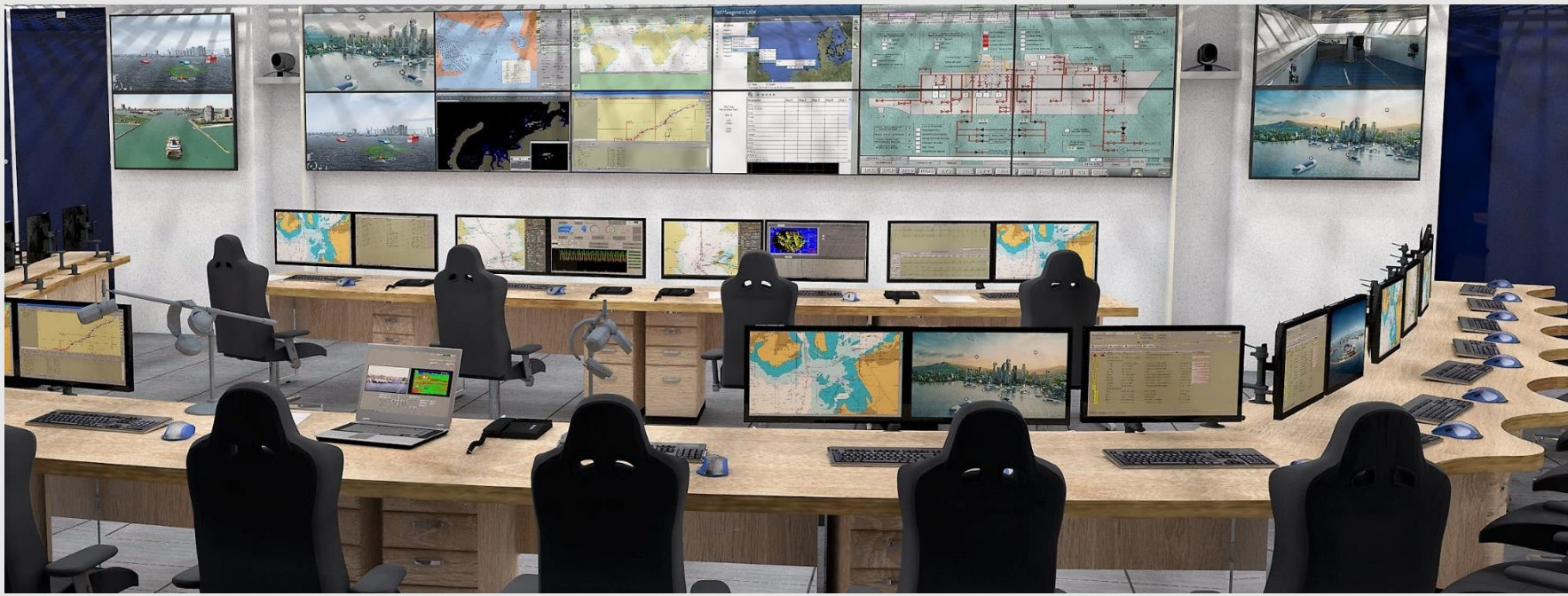
ON-BOARD TABLET

Portable device on the bridge as central resource for decision support, automatic reporting and ship/shore communication

- Redundant „Take me home" solution for navigation
- Extensive reporting and log functionality with automatic pre-filling (SmartLog TM)
- Decision support notifications on safety and efficiency
- 20-30 min traffic forecast and maneuver prediction

Fleet Operations Solution can be scaled from a single mobile phone to a whole operations center



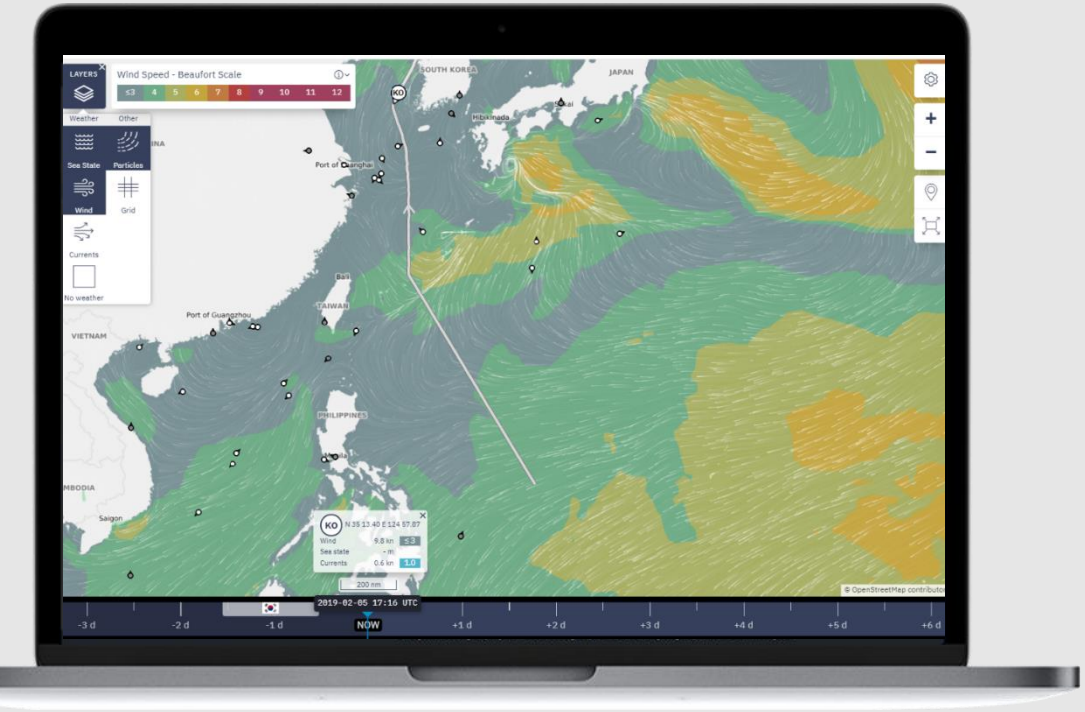


e.g. charter party alert

e.g. full fleet tracking, incl. speed and ETA management

TRACKING & AWARENESS

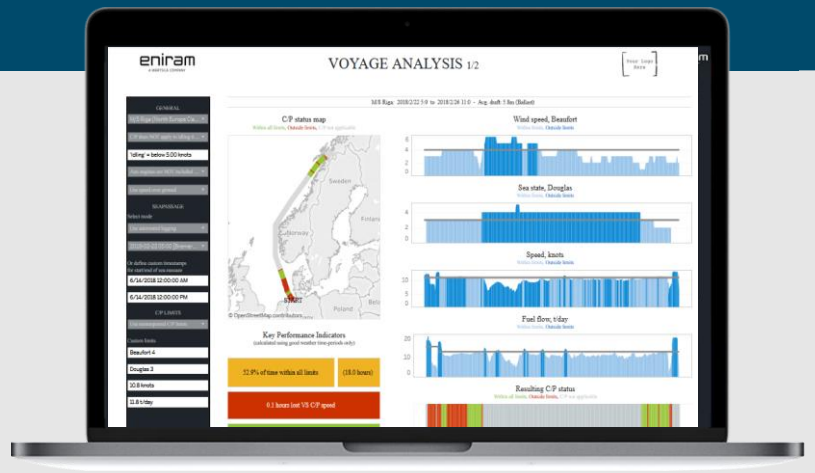
- Increased awareness on navigational hazards – transparency
- Improvement of ship shore communication
- Increased efficiency of shore based processes

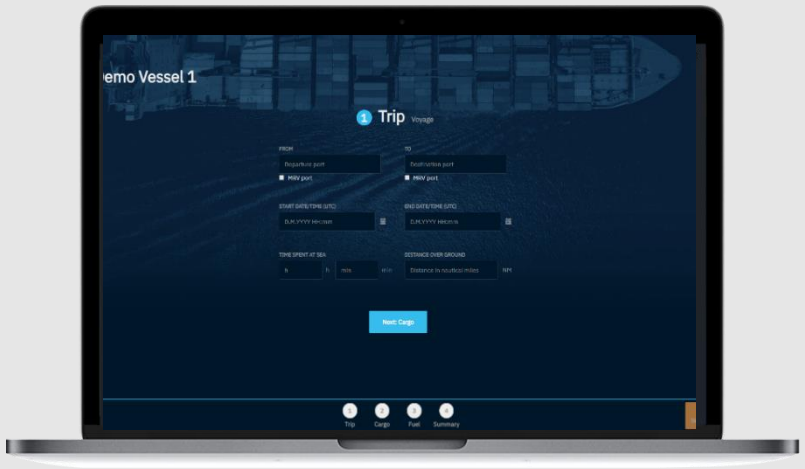


- Ship track & route including play-back and play-ahead
- Various chart backgrounds and overlays (weather, zones, etc)
- Zones management and notifications (e.g. MARPOL, ECAs, risk, etc.)
- Navigational notifications of safety relevant issues
- Ship/shore commenting of notifications/issues

COMPLIANCE & REPORTING

- Increase of process efficiency, less tedious and error proof reporting
- Lower risk of regulatory and stakeholder claims
- Build up of common data set for increased transparency and other value adds

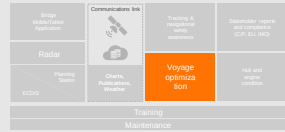




- C/P compliance voyage report, generated automatically. Provides independent assessment of voyage C/P performance and claims.
- C/P Risk Management Toolkit, providing visibility of claims risk and notifications
- Prepopulated MRV report based on report and ECDIS data
- Automated IMO DCS as sub-set of EU MRV

VOYAGE & PORTS

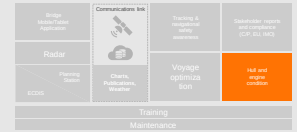
- Lower operational cost
- Higher process efficiency
- Transparency to fuel efficiency
- Charter market attractiveness
- Satisfying operator requirements
- Seamlessly connected to onboard system

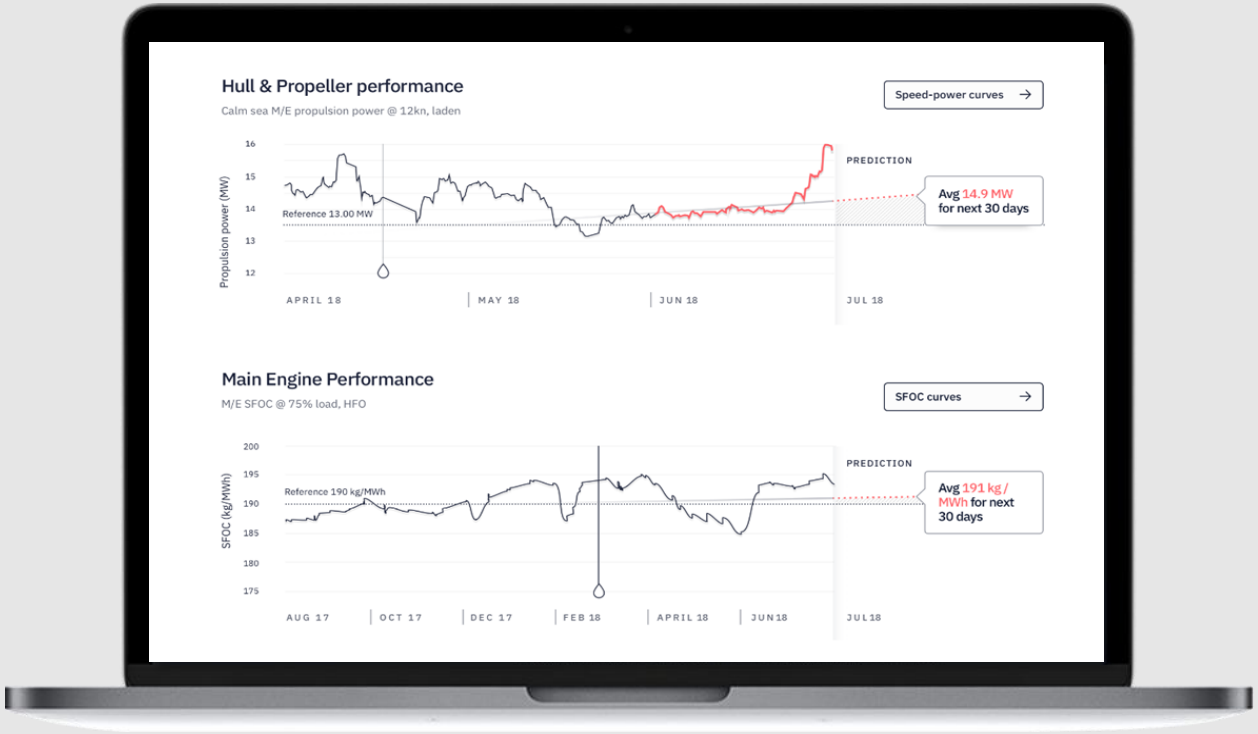


- Planning: Combination of safety and efficiency based routing (incl. energy forecast)
- Execution: Real-time analysis & notifications of route/speed execution
- Automatic exchange of berth availability and RTA information between port and vessel ECDIS. Using new STM standard
- Post voyage analysis:
  Fuel consumption breakdown to speed & route excess cost; monthly/quarterly voyage KPI benchmarking for shore/management

HULL & ENGINE

- Save fuel (operators) or price vessels correctly (owners)
- Lower maintenance effort / better scheduling
- Identify areas of improvement / choose investment with best ROI





- Hull and propeller degradation assessment
- Engine and system usage optimization
- Engine condition assessment
- Lubes and and lubricator optimization

REAL-TIME DATA USED FOR SIMULATION AND TRAINING

- Shore-based crews **simulate and analyze scenarios, provide advice and support to the ship** with operations PRE, DURING and POST EVENT
- **Historical data is analyzed** to identify potential gaps in competence
- Simulator scenario creation, based on FOS data, can be used for case and **R&D studies, incident investigation** and **Gap-analysis** for development of **new training initiatives and procedures**
- **Feeding back** analysis of training scenarios **to close the loop**

THANK YOU

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Are accident events out of the blue?

SPOTLIGHT ON SAFETY: WHY ACCIDENTS ARE OFTEN NOT ACCIDENTAL
International Organization of Masters, Mates & Pilots (MM&P) july 2019

The General Maritime Law that governs international shipping has effectively insulated upper level managers from the consequences of regulatory non-compliance, provided that they can deny knowledge of it.
The International Safety Management (ISM) Code, with its provision requiring that deficiencies be reported to a Designated Person Ashore, is designed to inform managers and bring them into the circle of responsibility. Although technology provides ship operators with the ability to have immediate knowledge of conditions aboard ship, including the degree of compliance with regulatory standards, there is a tendency to discourage reporting so as to maintain management's immunity from personal liability.

It is difficult to establish a shared safety culture between the ship and management when the future of the master and crew may depend on not sharing safety information with management.

This problem may be exacerbated by "regulatory capture," which can happen when marine inspectors are pressured by their superiors to "look the other way."

Backup slides

Intellitug

- harbour tug with autonomous navigation
- Singapore PSA & MPA cooperation

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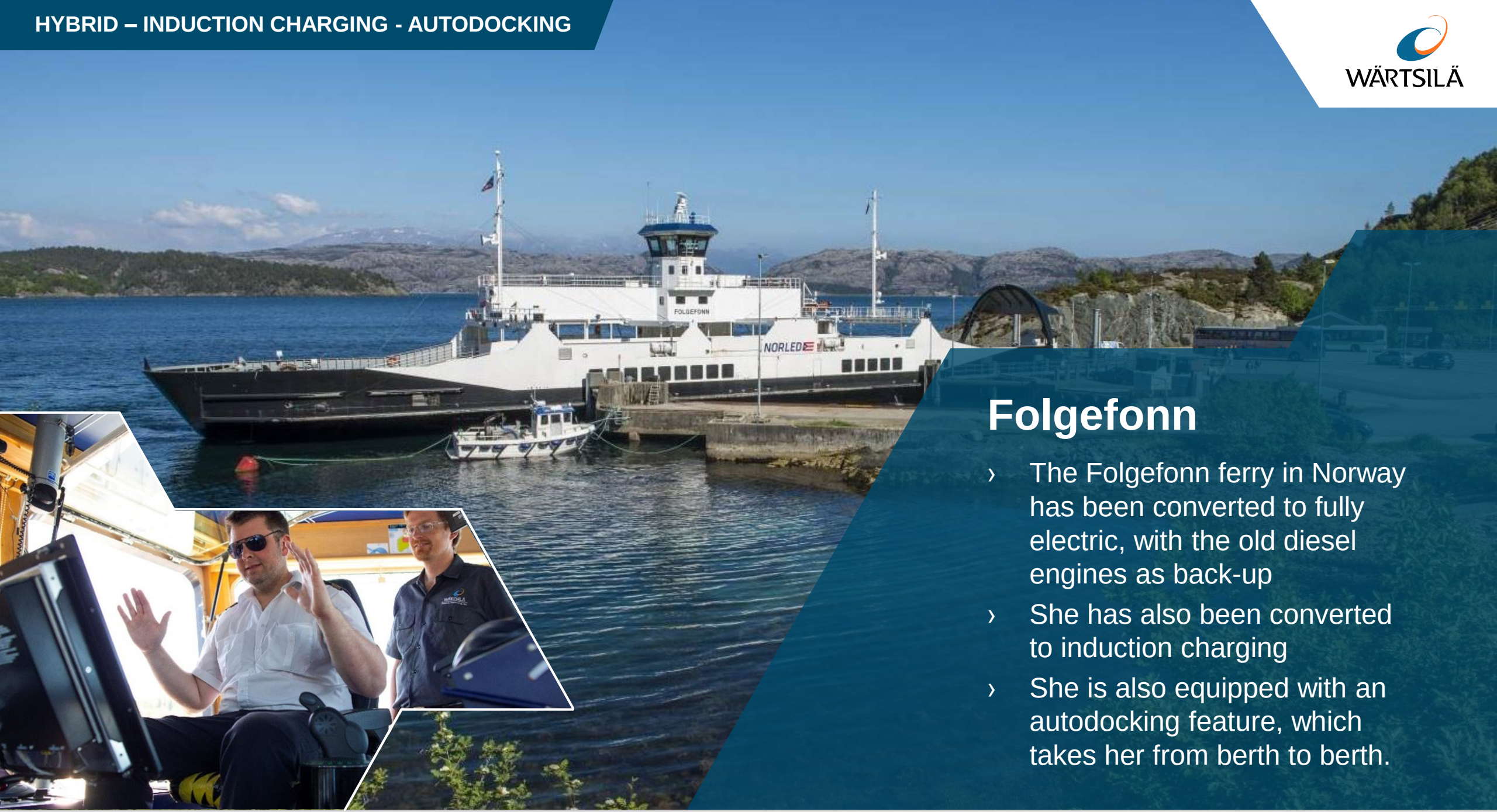
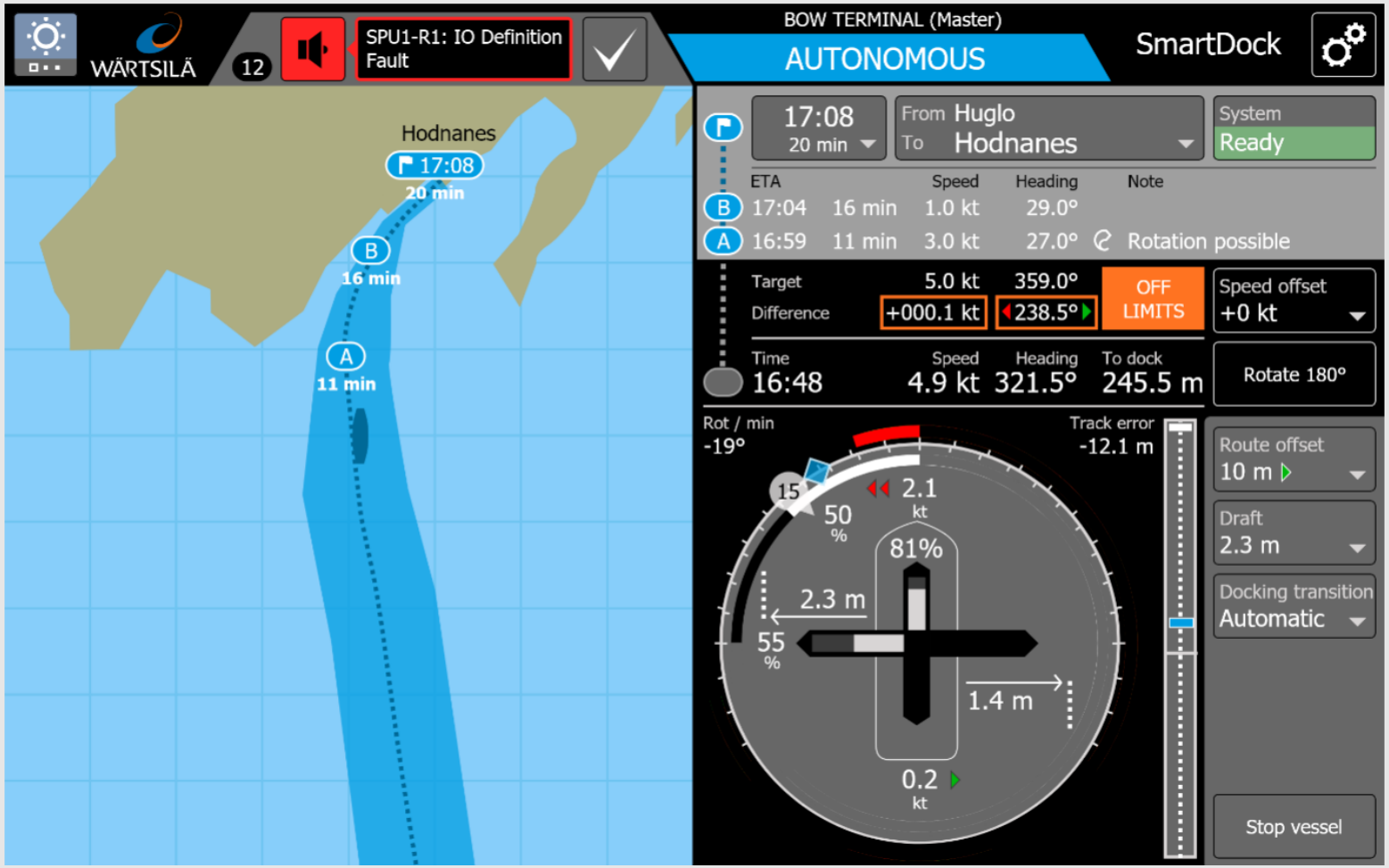


Folgefonn

- The Folgefonn ferry in Norway has been converted to fully electric, with the old diesel engines as back-up
- She has also been converted to induction charging
- She is also equipped with an autodocking feature, which takes her from berth to berth.

Auto Docking

- Man-in-the-loop fully automatic dock-to-dock
  - No anti-collision

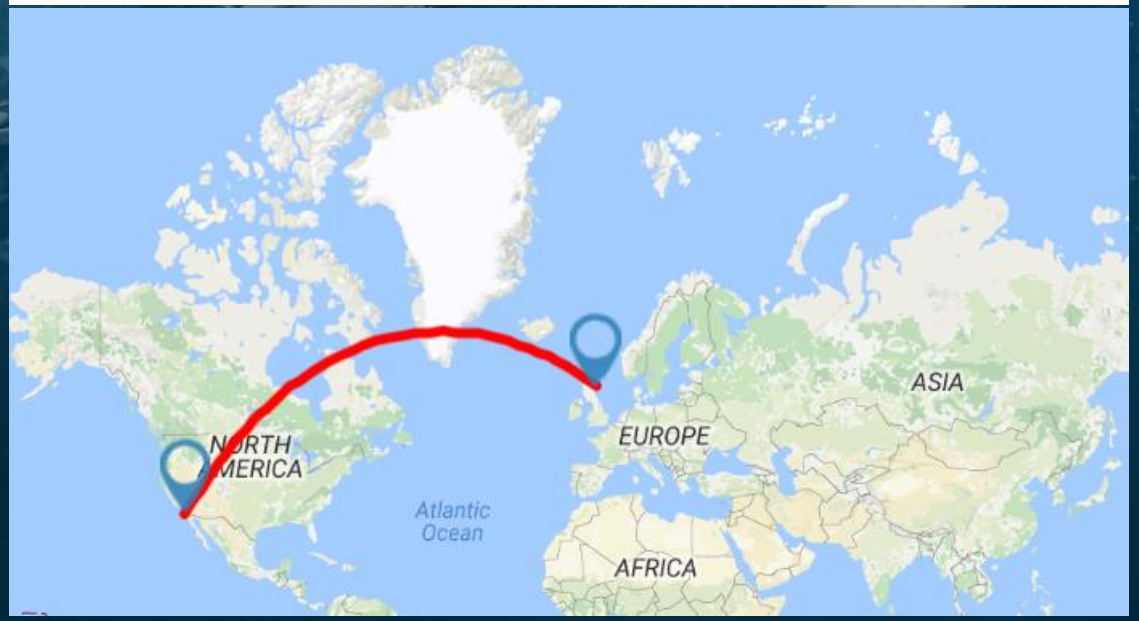


Remote control trials:

- Testing done in connection with DP trials, with full crew onboard, as well as DP S/E
- The **system upgrade** required for the test to happen **took only ca. 30 hours**
- 3-4 hours of maneuvers off the coast of Aberdeen, remote controlled from San Diego: **8000 km distance**
- *Fun fact: a W was drawn at the end of the test to sign-off*

HIGHLAND CHIEFTAIN

Type:	PSV
LOA (ft / m):	260 / 79
BHP:	9598
DWT (mt):	4000
Deck Area (ft² / m²):	9106 / 846
Mud Capacity (bbls / m³):	7308 / 1,161
DP:	DP-2
Flag:	British
Region:	North Sea



SPACEX DRONE SHIP