Maritime digitalization; opportunities for the maritime e-Nav industry when moving to Intelligent Navigation

Bjørn Åge Hjøllo
e-Nav Manager NAVTOR A/S
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NavTracker

Map Options | Catalog | Weather | Piracy | Contingency | Settings

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ALSEY
HAVSTRAUM
LISTERVIK
NEWFOUNDLAND VICTOR
MOZART
SARAH
AMORINA
KISS
SEABED SUPPORTER
SSI PRIDE
GWEN
BOW CO
ALEXANDROS III
MORNING CORNELIA
MORNING CAROLINE
VAMOS
QUINOX DREAM
AAL DAMPIER
ALCYONE

2011; Founded
2012; 1st vessel

Q1-2018;
Reaching
4000 vessels

YTD 2019;
> 5555 vessels!

All segments, world-wide

CARGO

- Synergy Group
- Grieg Star
- Columbia Shipmanagement Ltd.
- BSM Bernhard Schulte Shipmanagement
- Fleet Management Limited, A Caravel Group Company
- "K" Line, Kawasaki Kisen Kaisha, Ltd.
- MOL, Mitsui O.S.K. Lines
- V.Ships
- Wilhelmsen

CRUISES

- Norwegian Cruise Line
- Crystal Cruises
- Royal Caribbean International
- Celebrity Cruises
- Star Cruises, The Leading Cruise Line In Asia-Pacific
- Genting Cruise Lines

TANKERS

- Teekay Tankers Ltd.
- Exmar Ship Management
- SeaTeam Management
- Bahri
- Goodwood Ship Management
- Odfjell
- Höegh LNG
- Stolt Tankers

OFFSHORE

- DCF
- Edison Chouest Offshore
- Solstad Offshore
- Havila
- Simon Møkster Shipping, e-Navigation made easy

e-Navigation…?

DEFINITION (IMO MSC); «The harmonized **collection, integration, exchange, presentation and analysis of marine information onboard and ashore by electronic means to enhance berth to berth navigation** and related services for safety and security at sea and protection of the marine environment»

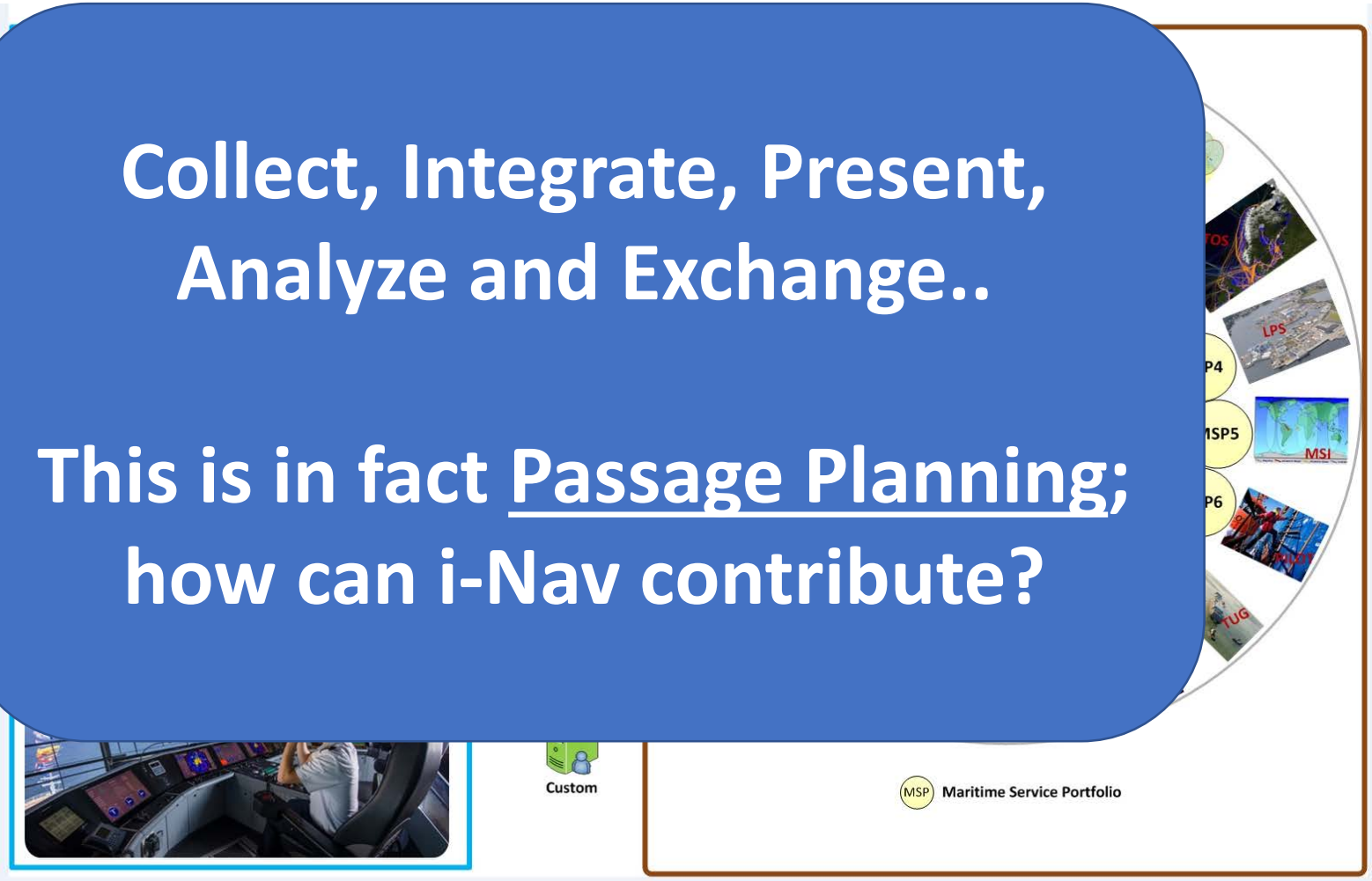
Concept of IMO's
Strategy Implementation Plan (SIP)

Five priortized solutions..

S4 – **Integration and presentation**
of available information
in graphical displays
received via communication equipment

Collect, Integrate, Present, Analyze and Exchange..

This is in fact Passage Planning; how can i-Nav contribute?



Courtesy of Norwegian Coastal Administration

Passage Planning

Passage Planning (Voyage Planning) is a **mandatory action to take place prior to any sailing**, according to IMO regulations, and further fine-tuned by e.g. OCIMF:
IMO A.982(21) / **SOLAS Ch. V** Reg. 34 and **OCIMF** SIRE/VIQ

The traditional Passage Plan proces is very man-intensive!

There are four clear PP-stages defined;

Appraisal, Planning, Execution and Monitoring

There are **no specific TEMPLATE** made available, so best practice is for each ship owner to make own versions of the Passage Plan.

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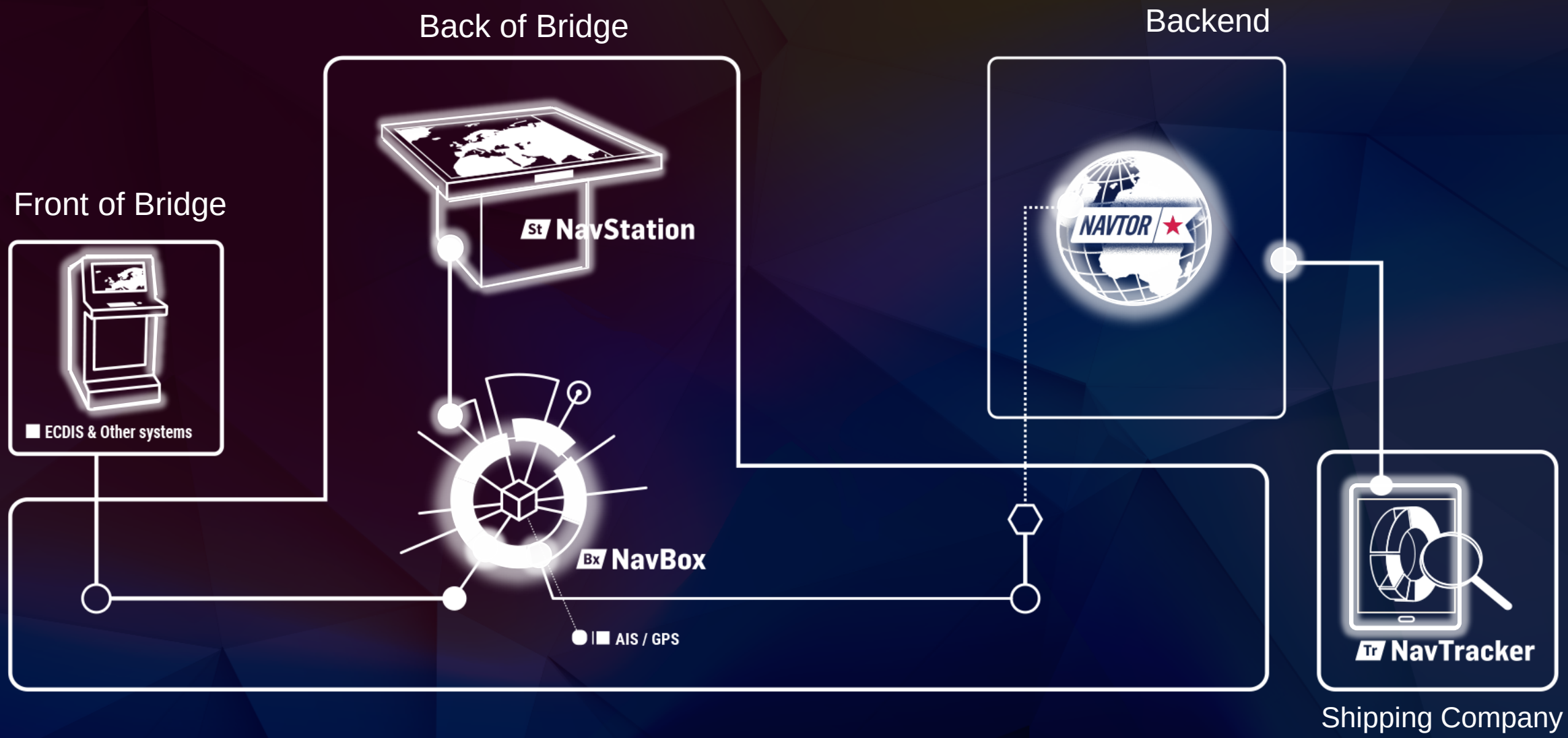
E-Nav platform for connecting Ship & Shore

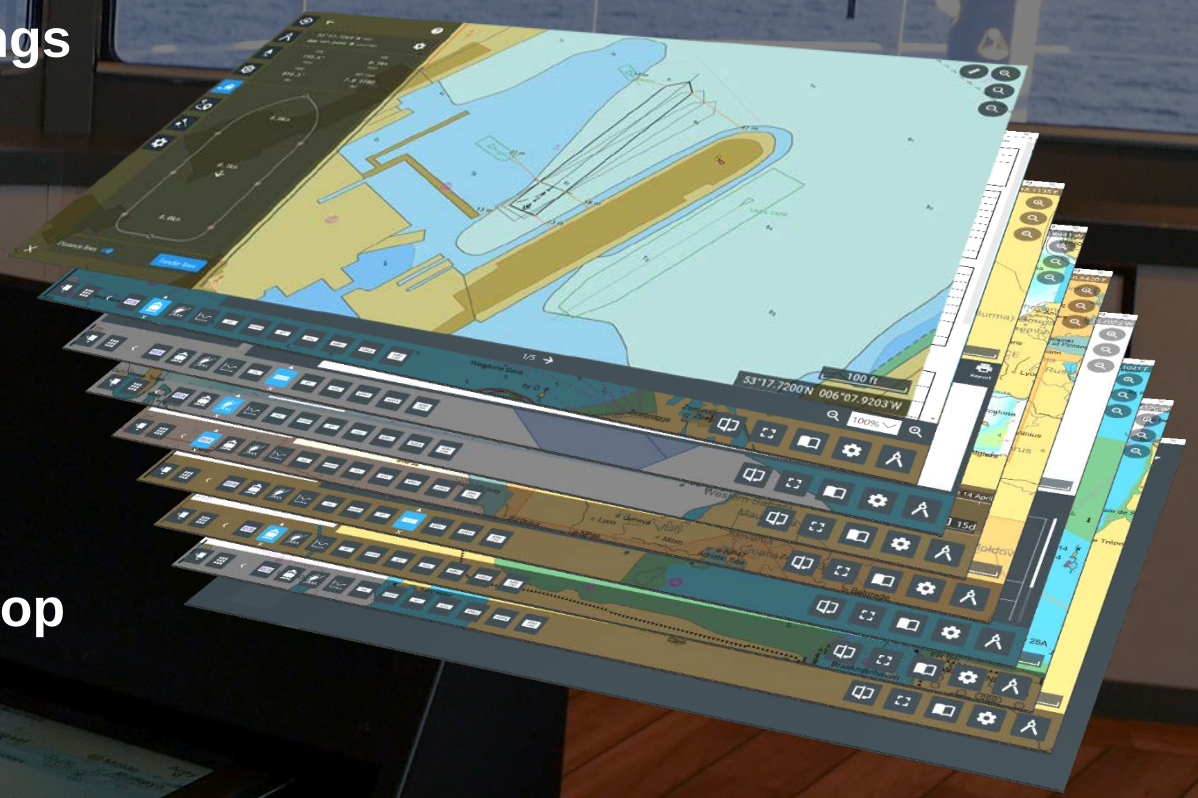


NavStation

Back of Bridge SW for
Overview, Planning
and Monitoring

Planning station enabling all critical voyage information at the fingertips of navigators

9. Mooring/Manuvering Assistant
8. Passage Planning
7. NAVAREA Warnings
6. Weather Overlay
5. AENP
4. ADP
3. Route Planning
2. ENC
1. NavStation Desktop



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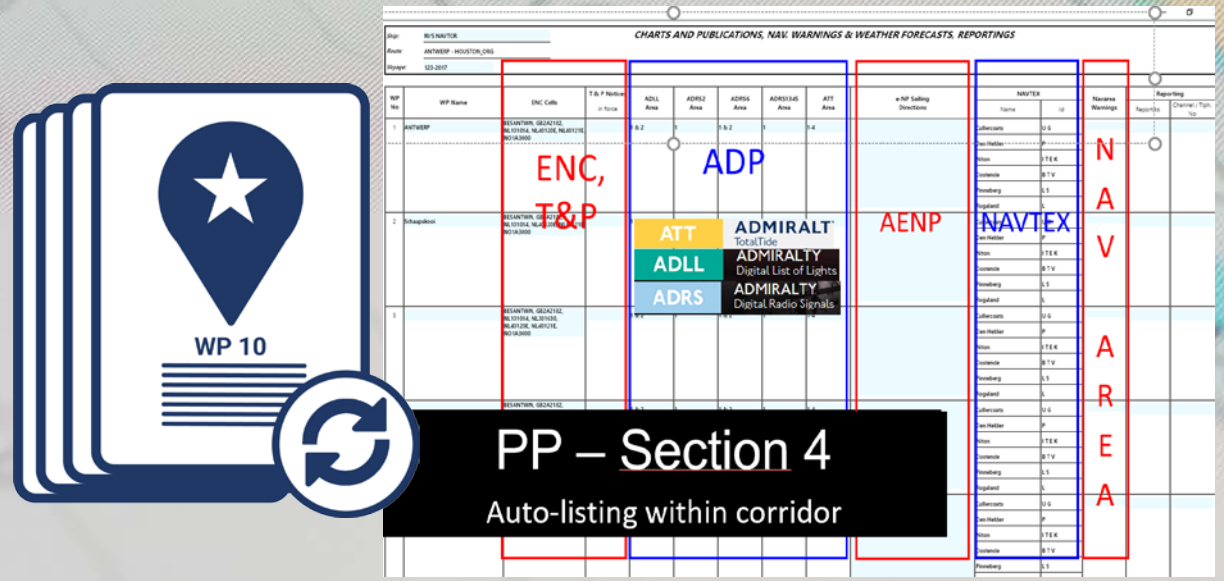
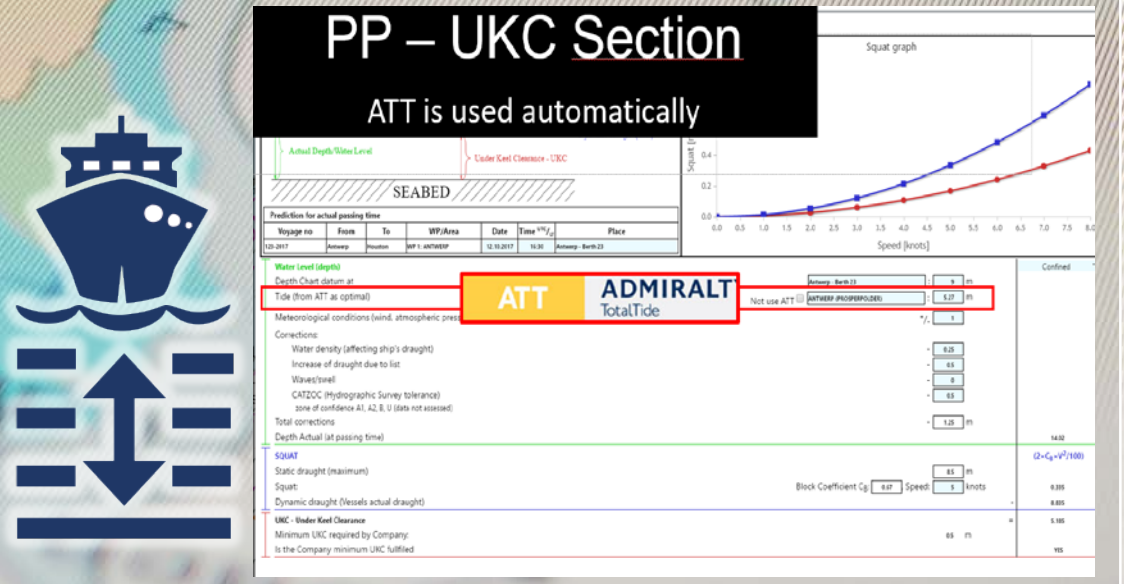
Passage PLANNING by e-Nav and i-Nav;

Automatic listing along route



Automatic UKC calculations & Safety check



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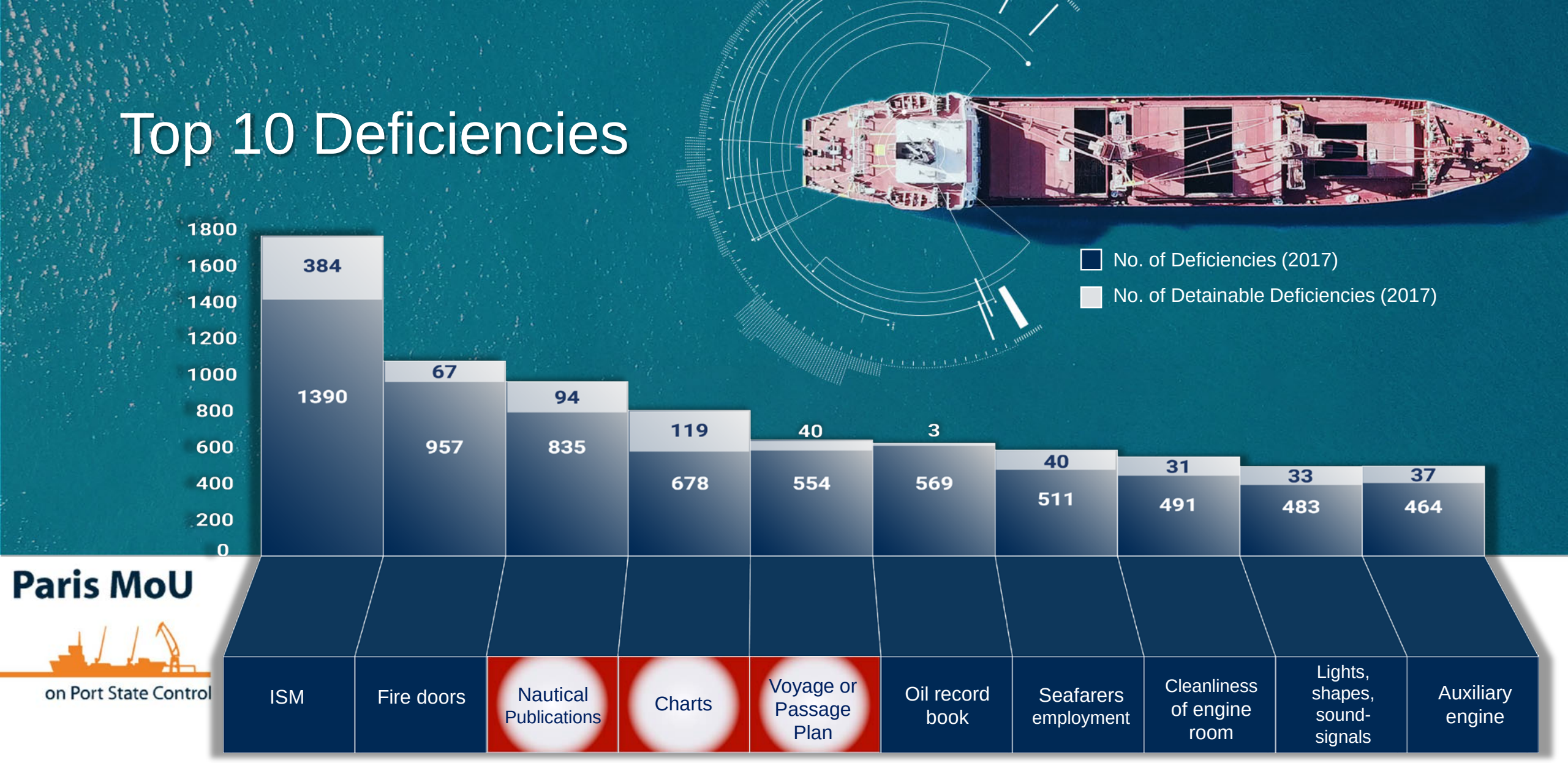
Source: Research findings from ENABLE-S3

Top 10 Deficiencies



Paris MoU on Port State Control

<---------- 25 % ---------->

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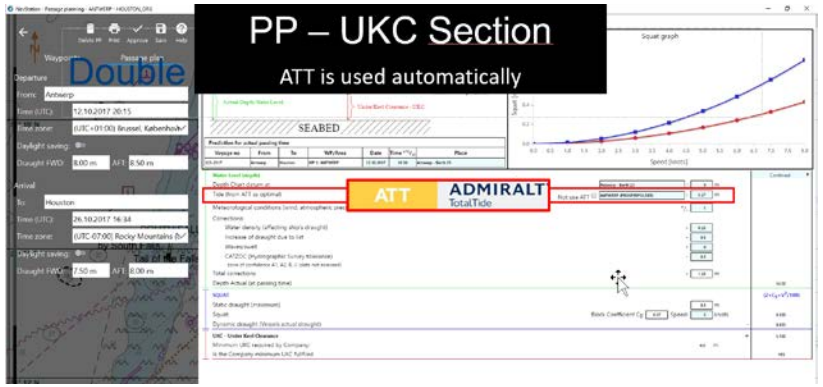
Intelligent Navigation combines Information exchange, SW and HW

PRESENT & ANALYSE



COLLECT & INTE ATE

EXCHA E & CYBER-SEC

END USER FEEDBACK
=> NEW INOVATIONS

IMO; Collect, Integrate, Present, Analyze and Exchange

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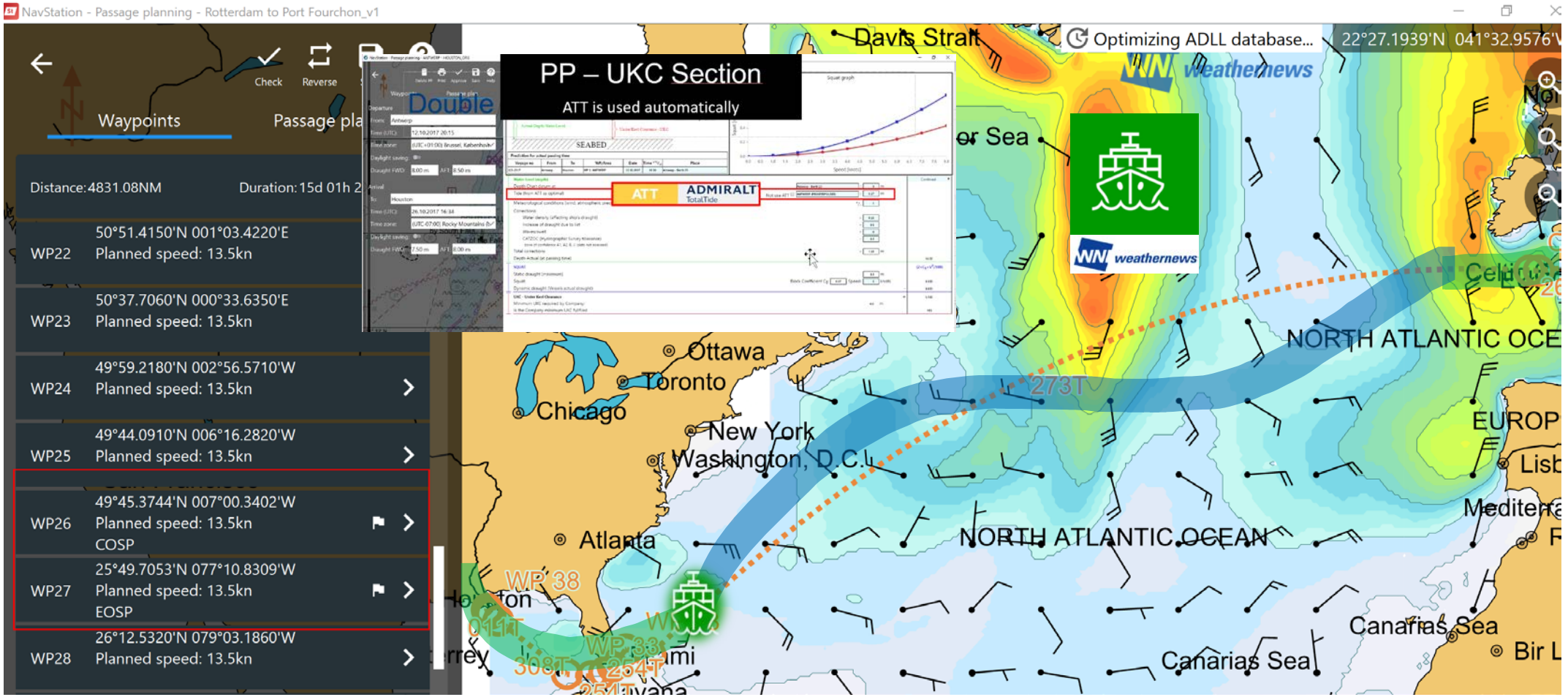
Intelligent Navigation;
e.g. Passage Planning + Optimization = One Operation



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Digital Charts & Publications

NavTracker
NavStick

(+Paper Charts and Publ.)

e-Navigation SW

NavTracker
NavBox
NavStation
SDK & G-ECDIS
(OEM – Collaboration)

In-house R&D and External Projects (~30pers.)

HANSA

CySiMS

SESAME Solution II

e-navigation
Intelligent Ship Traffic Management

M-AR

Maritime Data Space

Horizon 2020
European Union Funding for Research & Innovation

ECSEL Joint Undertaking
Electronic Components and Systems for European Leadership

Forskningsrådet
Maritim virksomhet og offshore operasjoner (MAROFF)

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Intelligent Navigation-

Business Case:

Automatic Ship Reporting-

(MRS and Single Window)

Related R&D projects

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SESAME II; Ship Reporting & New e-Nav Services including AI supported Optimization

WP1 – Automated Ship Reporting

Objective:

- Develop demonstrators that will automate electronic ship reporting to a National Single Window
- Develop demonstrators with a transparent process, including possible electronic handshakes/signatures/status messages, that facilitate trust in the system

SESAME Solution II

e-navigation
Intelligent Ship Traffic Management

WP3 – Expanding e-Navigation Services

Objective:

- Demonstrate the feasibility of expanding the e-Navigation services available on board by developing new services for the bridge team, VTS and ship owners, including: route optimization/weather routing, route monitoring/cross-check, Marine Safety Information, Optimal ETA monitoring, Optimal consumption monitoring, and pilot route service

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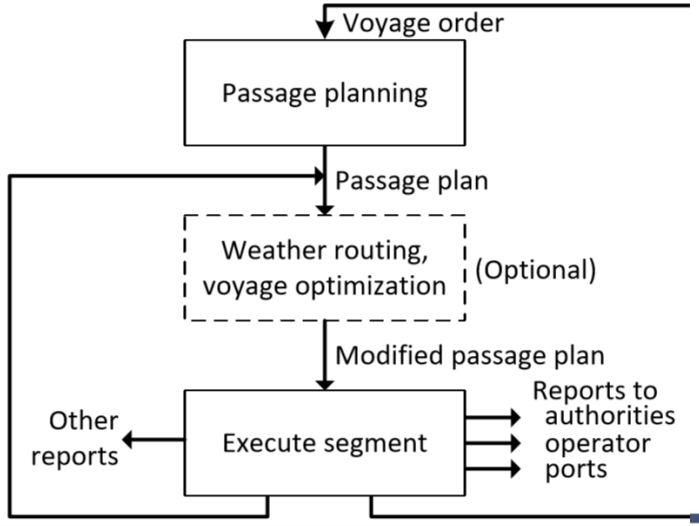
Forskningsrådet

Maritim virksomhet og offshore operasjoner (MAROFF)



Cross platform exchange by

“Maritime Data Space”

Project owner; NAVTOR

Partners; SINTEF, DNV GL, WSM, Goodtech

- Based on; Industry 4.0 and the International Data Space(s) (IDS)
- Goal; Develop an **open Maritime Data Exchange and Sharing Ecosystem**
- Use Case 3; **Ship Reporting by Cross Platform Information Exchange;**

We want a model where the data owner(s) directly control access rights, independently of where the data is stored.

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Cyber Security in Merchant Shipping – Service Evolution

Forskningsrådet
Maritim virksomhet og offshore operasjoner (MAROFF)

- CySiMS (2015-2018); RCN funded project that developed **specifications for a new public key system for the maritime world**. The results have been met with much interest in IMO and become an **official IALA2 standard**.
- Urgent need to develop these specifications further into a complete system and complete an extensive **cost**-benefit analysis.
- The key issues **CySiMS-SE** (Q2/19 – Q2/21) will address are;
  - How to deal with certificate updates when ships are offline for long periods of time.
  - Cost-effective distribution of private keys on smart cards to the relatively low number of commercial ships (<100 000).
  - How to transfer certificate caches to the on-ship equipment on both the bridge and administrative local network (overcome separation requirements).

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Seamless, Automatic Updating

Cyber secure exchange

Bx NavBox

AIS / GPS

Cyber Security

DNV-GL Type Approved

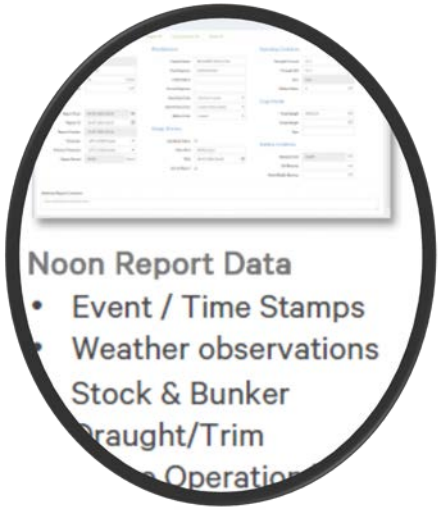
IEC 61162-460 Gateway

What next?

- IMO definition of e-Navigation includes "…protection of the marine environment"
- The answer is in fact common between most stakeholders, next milestone for international shipping is **GREEN shipping**, and
  - IMO has expressed it clearly; we aim for a 30% reduction in GHG by 2030 (and 50% by 2050, and hopefully more before…)
  - Our End-users and Customers ask for the green shipping, including cost savings and fuel reductions
- NAVTOR's has already planned for NavGreen some time, and most of our ongoing and planned R&D are focusing along the NavGreen line;

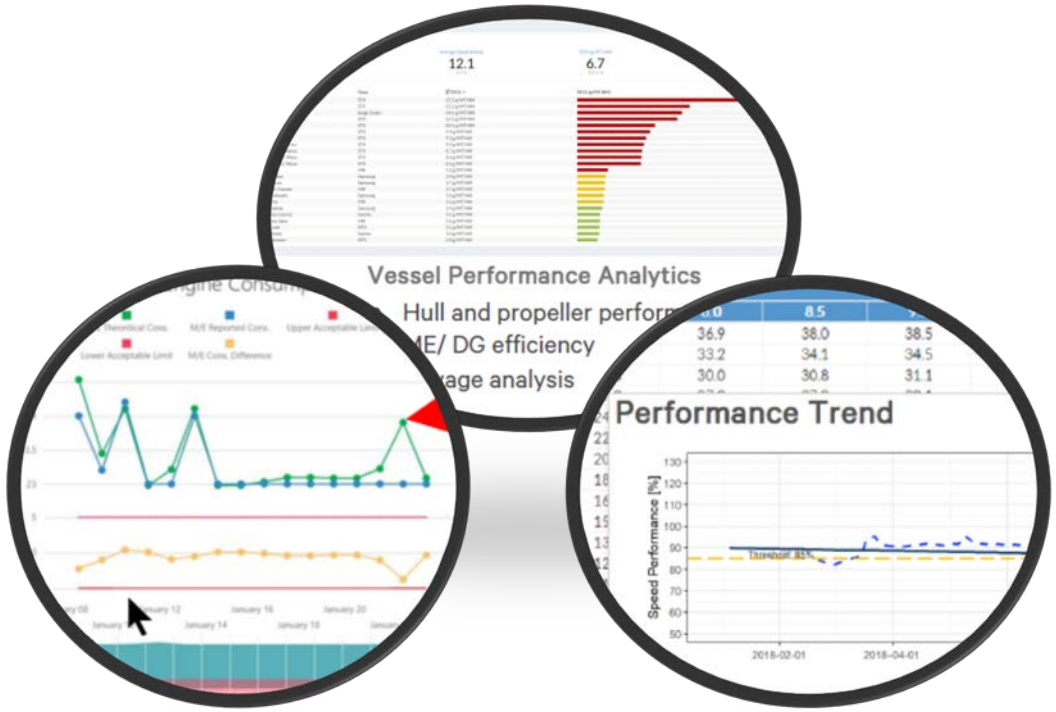
Summary of NavGreen & Performance

DATA CATCH



1. Passage Plan
2. Noon Report
3. Sensors feed

ANACLYTICs



Real time anomalies detection

Trends

MONITORING & DECISISON SUPPORT

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Thank you!

Bjørn Åge Hjøllo

e-Nav Manager NAVTOR A/S

bjorn.hjollo@navtor.com