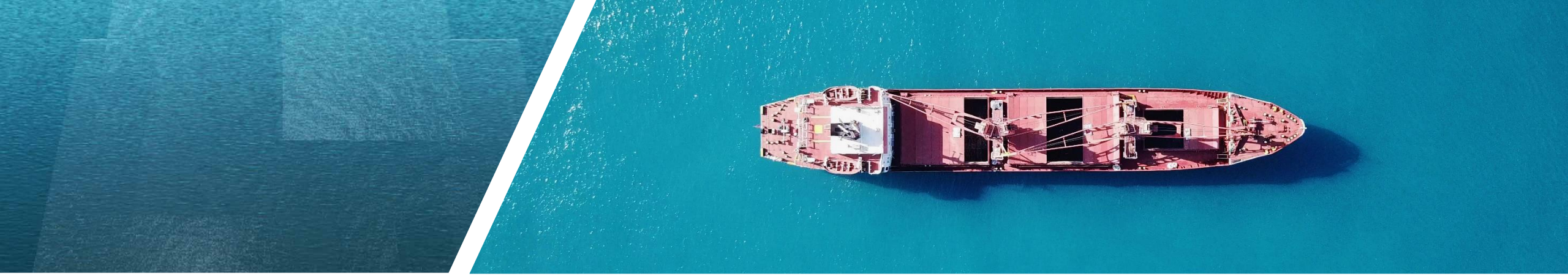


NAVTOR; a Norwegian SME and global e-Navigation provider

Bjørn Åge Hjøllo

e-Nav Manager NAVTOR A/S

IMR-Copernicus meeting, October 23rd 2019

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»

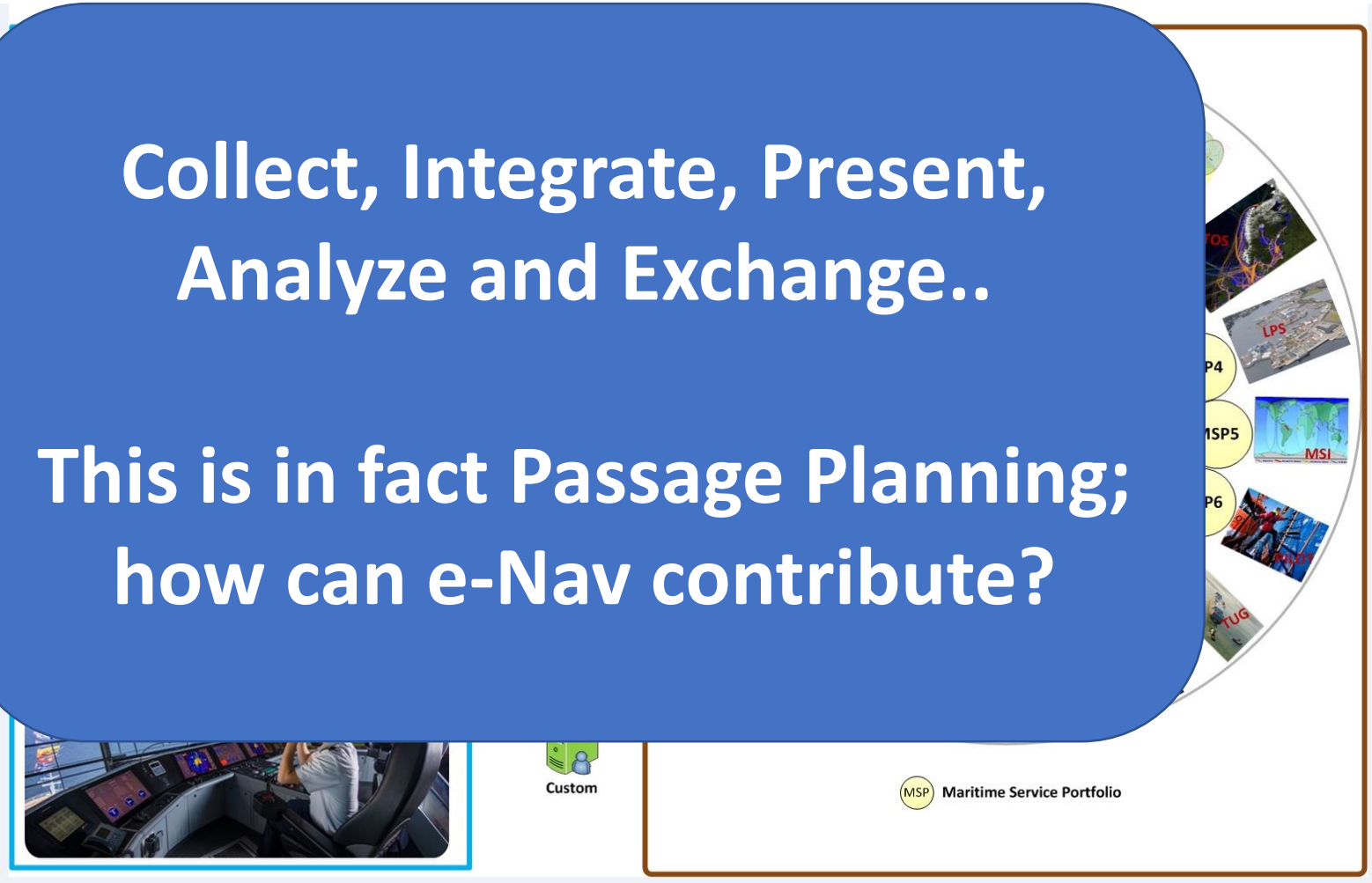
Concept of IMO's
Strategy Implementation Plan (SIP)

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 e-Nav contribute?



Courtesy of Norwegian Coastal Administration

Navigating to Green Shipping

1980s:
- Raster Charts (ARCS)
- Vector Charts (C-MAP)

1999:
- First ECDIS
- Lack of ENCs
- Old business models

2011:

NAVTOR

e-Navigation

2012-2018:
- Implementation of the ECDIS Mandate
- **PAYS as the new business** model for ENC-distribution

Connected shipping;
- NAVTOR Platform

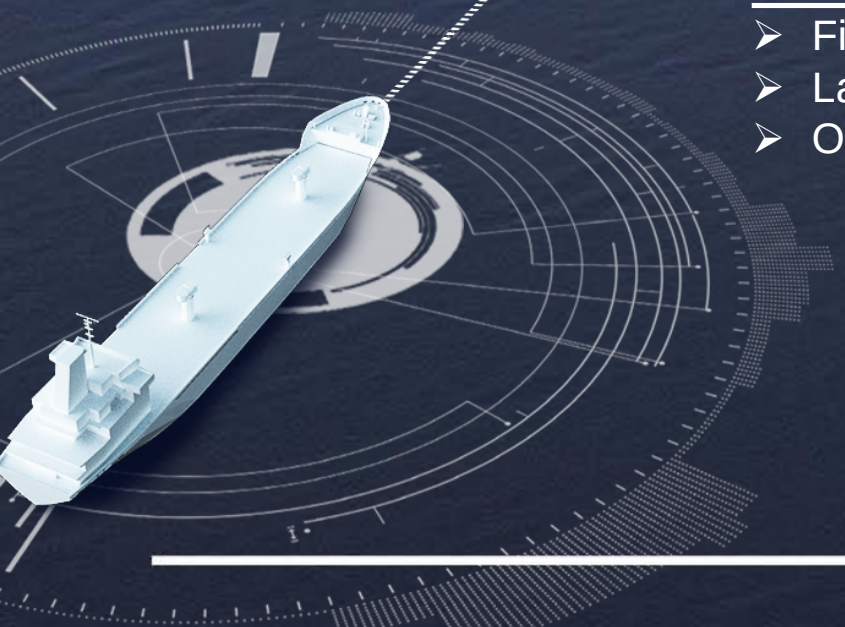
2019:

i-Navigation

***i**ntegrated, **i**nformative & **i**ntelligent*

2020 -

NavGreen;
- *Planning*
- *Monitoring*
- *Data exchange - AI*
- *Performance*
- *Increased focus on Shore Side services*



NAVTOR
e-Navigation made easy

All segments, world-wide

CARGO

CRUISES

TANKERS

OFFSHORE

Digital Charts & Publications

(+Paper Charts and Publ.)

e-Navigation SW

NavTracker
NavBox
NavStation
OEM – Collaboration

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

HANSA

CySiMS

SESAME Solution II

e-navigation
Intelligent Ship Traffic Management

M-AR

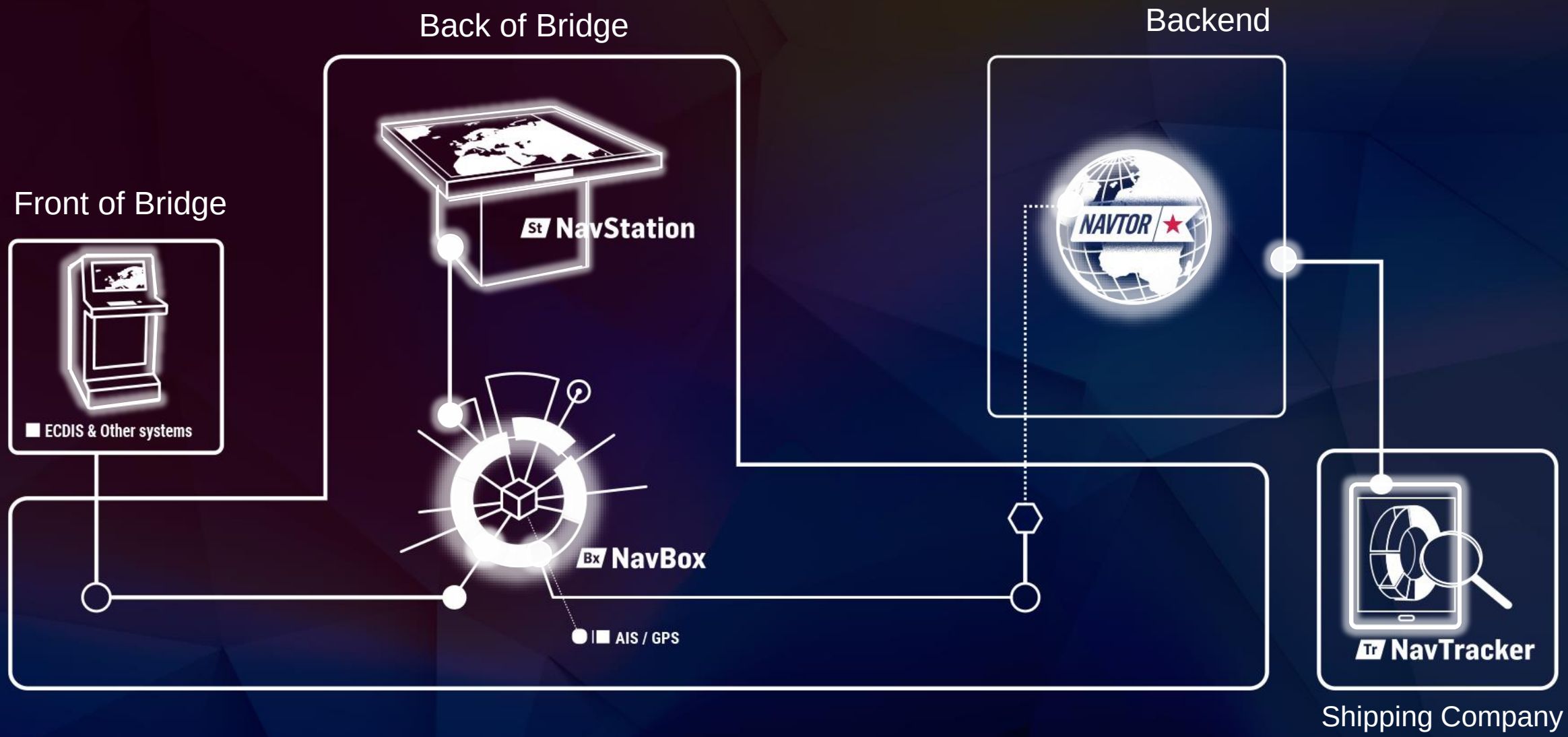
Maritime Data Space

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)

E-Nav platform for connecting Ship & Shore



St NavStation

Passage Planning

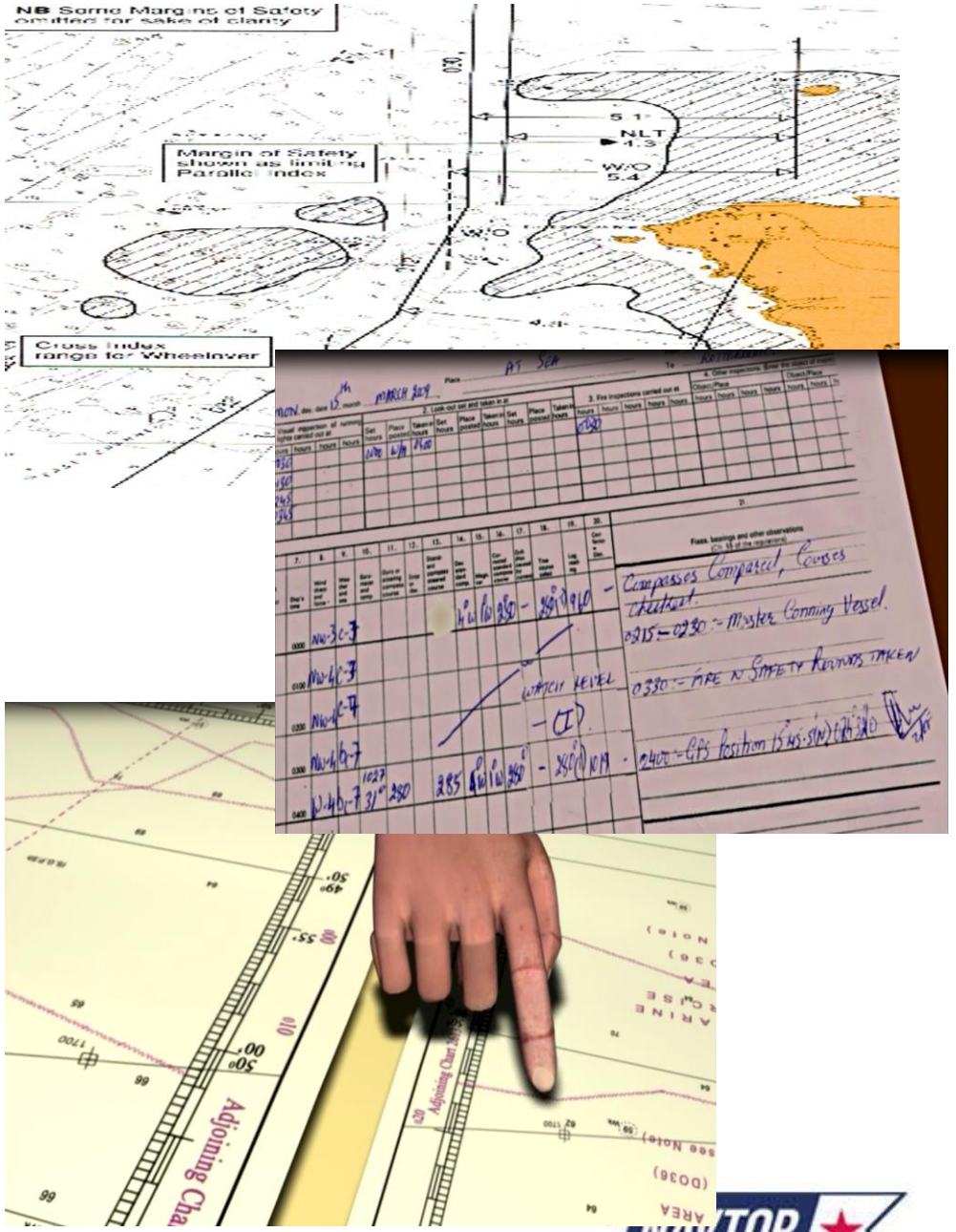
Passage Planning (Voyage Planning) is a **mandatory action to take place prior to any sailing**, according to IMO regulations, and further fine-tuned by e.g. OCIMF:
IMO A.982(21) / **SOLAS Ch. V** Reg. 34 and **OCIMF** SIRE/VIQ

The traditional Passage Plan process is very man-intensive!

There are four clear PP-stages defined;

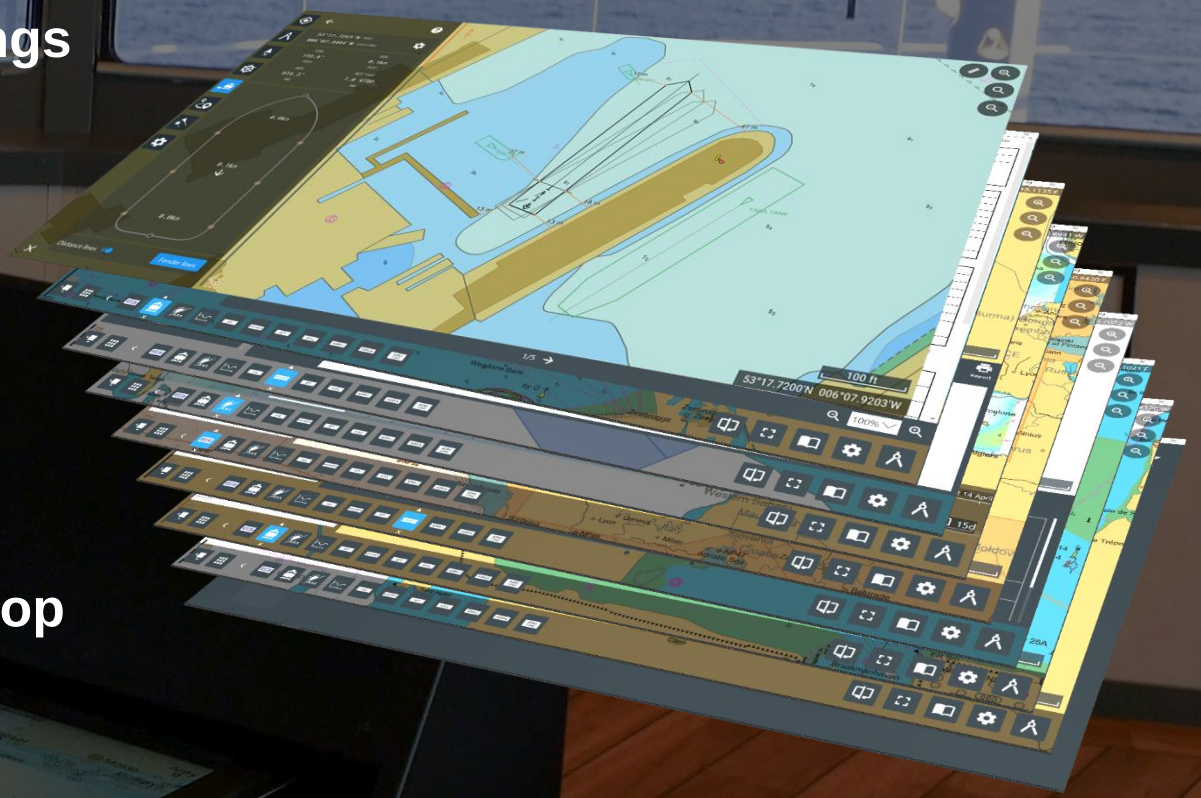
Appraisal, Planning, Execution and Monitoring

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



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

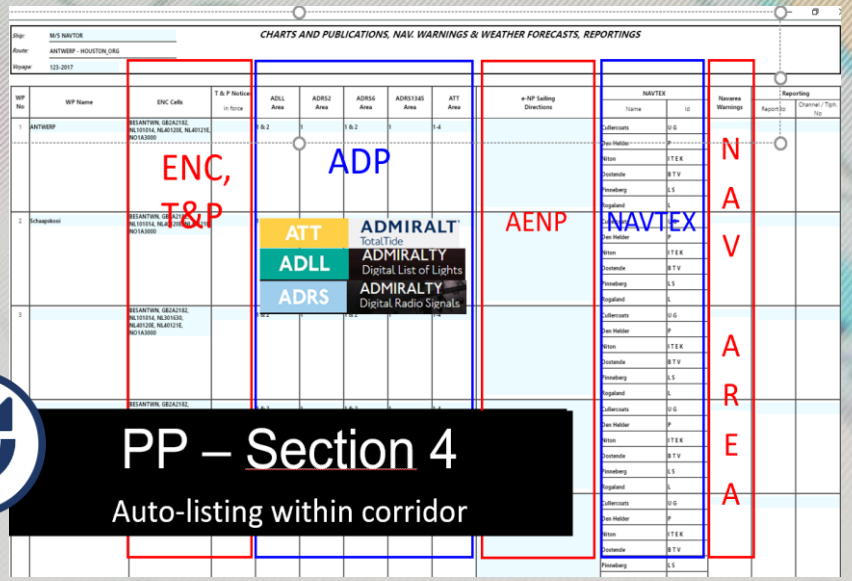
9. Mooring/Manuvering Assistant
8. Passage Planning
7. NAVAREA Warnings
6. Weather Overlay
5. AENP
4. ADP
3. Route Planning
2. ENC
1. NavStation Desktop



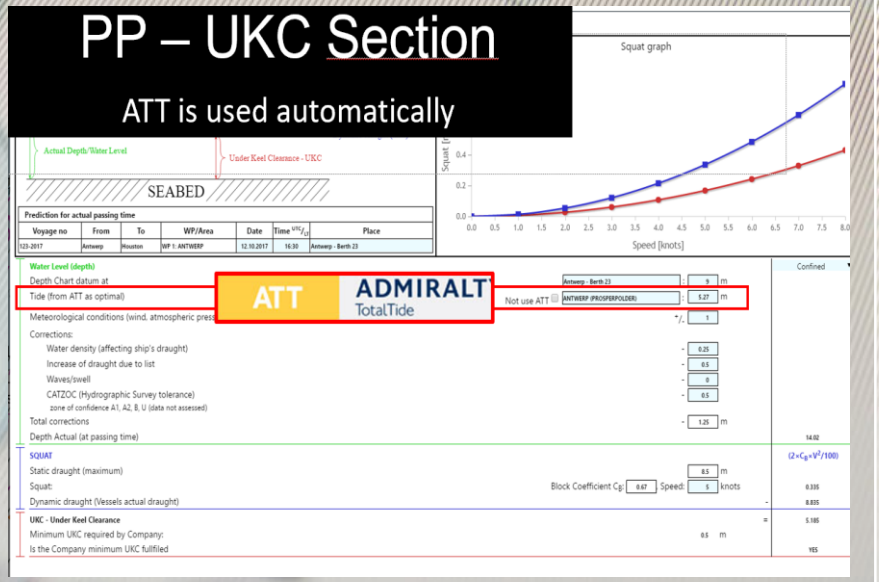
NAVTOR

Passage PLANNING by e-Navigation;

Automatic listing along route

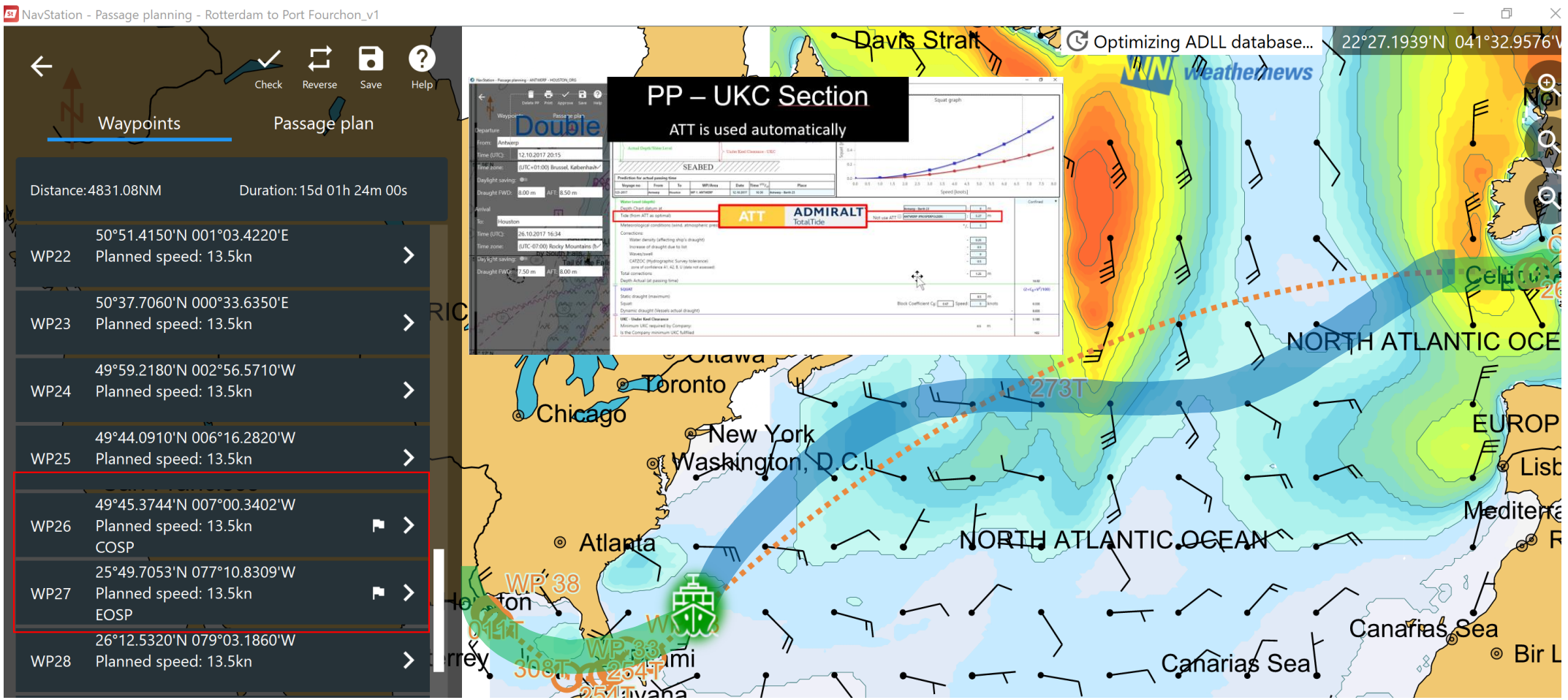


Automatic UKC calculations & Safety check



NAVTOR

Passage Planning + Optimization = One Operation



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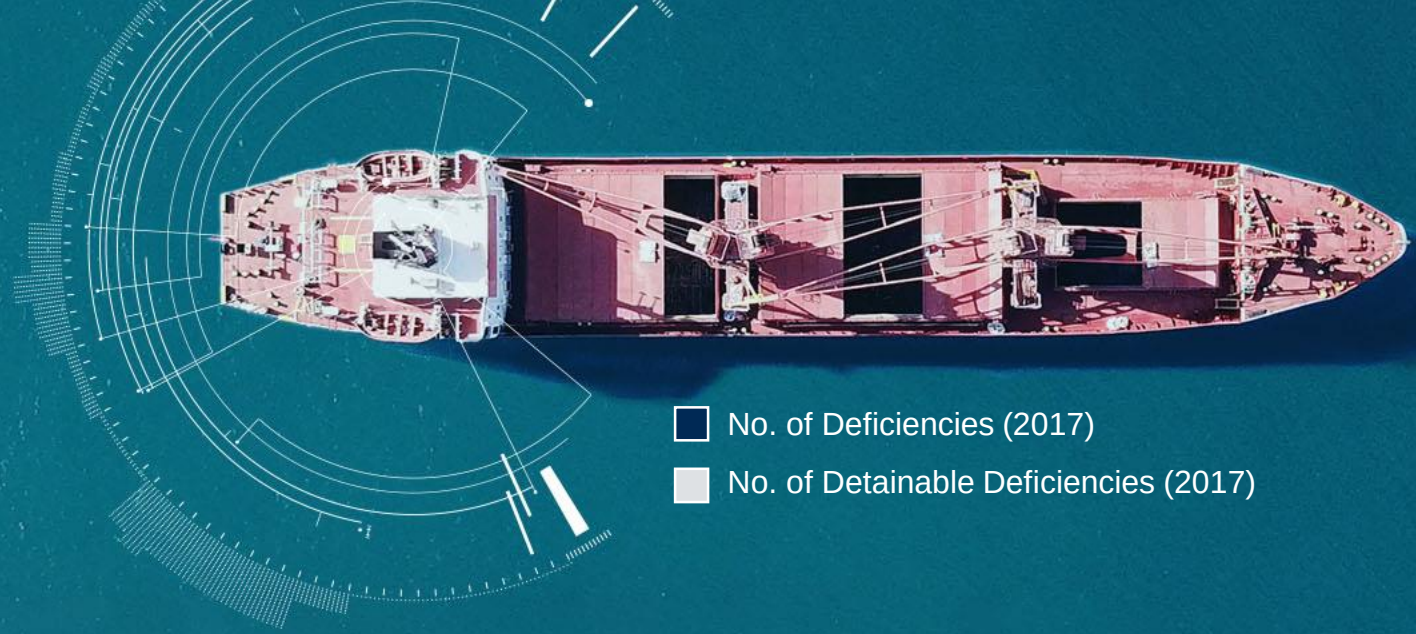
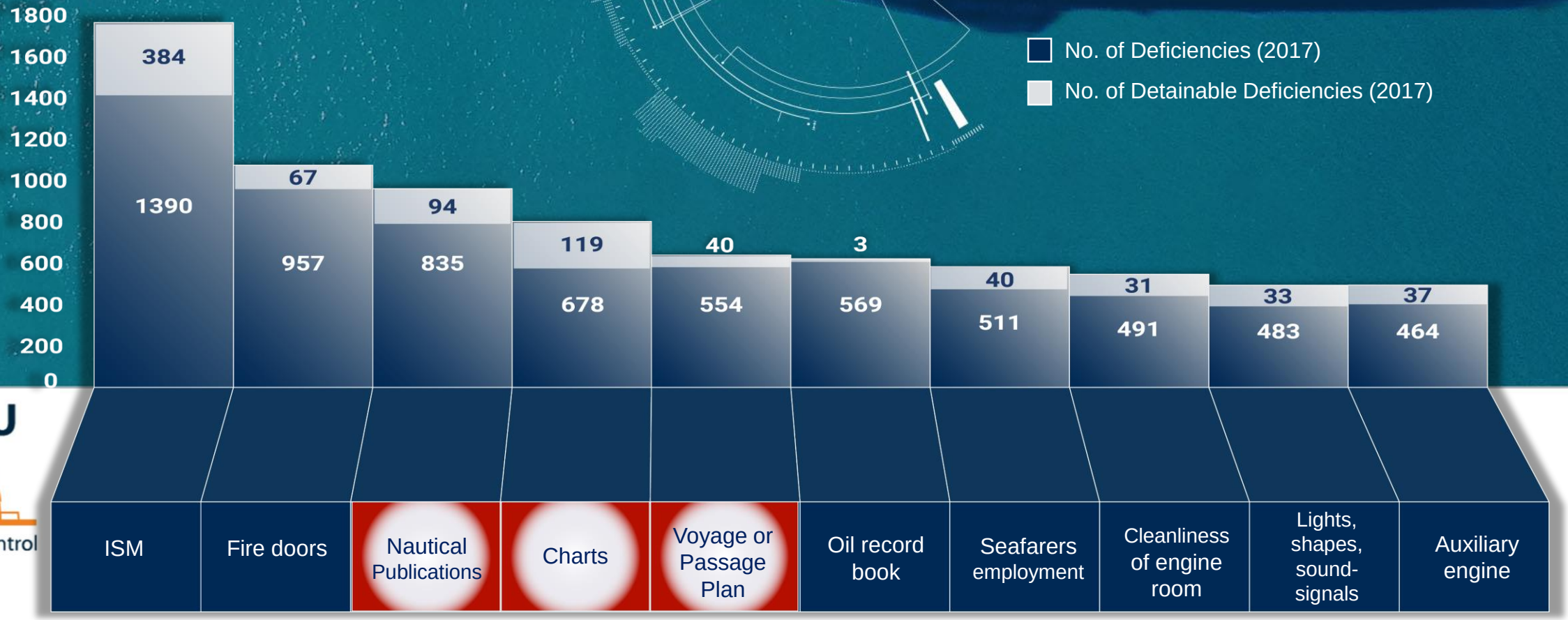
e-Navigation made easy

The benefits of **e-Navigation**

Source: Research findings from ENABLE-S3

Top 10 Deficiencies





Paris MoU

on Port State Control

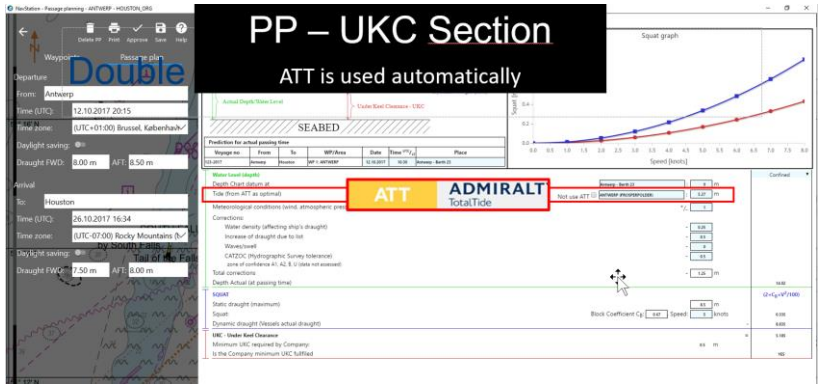
<---------- 25 % ---------->

NAVTOR

What have NAVTOR done related to e-NAV..?

COLLECT & INTE ATE

PRESENT & ANALYSE



EXCHA E & CYBER-SEC

END USER FEEDBACK
=> NEW INOVATIONS

IMO; Collect, Integrate, Present, Analyze and Exchange

NAVTOR
e-Navigation made easy

What next?

- IMO def. of e-Nav 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

→ Will need State-of-Art oceanographic observations and forecasts

Possibilities and challenges

using Copernicus products in ~~Ship routing~~ e-Navigation applications

MARINE NAVIGATION

COPERNICUS MARINE SERVICE PROVIDES OCEAN CURRENT, SEA ICE AND WAVE PRODUCTS CONTRIBUTING TO **SAFER** AND MORE **ECOLOGICAL MARINE NAVIGATION**

Ship routing allows maritime shipping companies to reduce fleet navigation risks, save fuel and reduce CO_2 emissions. The daily forecasts of the Copernicus Marine Service ocean models provide ocean current, significant wave height and sea ice parameters for the global oceans and European Seas. These can be used as input conditions for ship routing software. The Copernicus Marine Service sea ice satellite products also help maritime shipping companies find the safest navigation routes through ice-covered areas.

COPERNICUS MARINE SERVICE PROVIDES OCEAN CURRENT, SEA ICE AND WAVES

COPERNICUS MARINE SERVICE DO NOT PROVIDES ATMOSPHERIC DATA

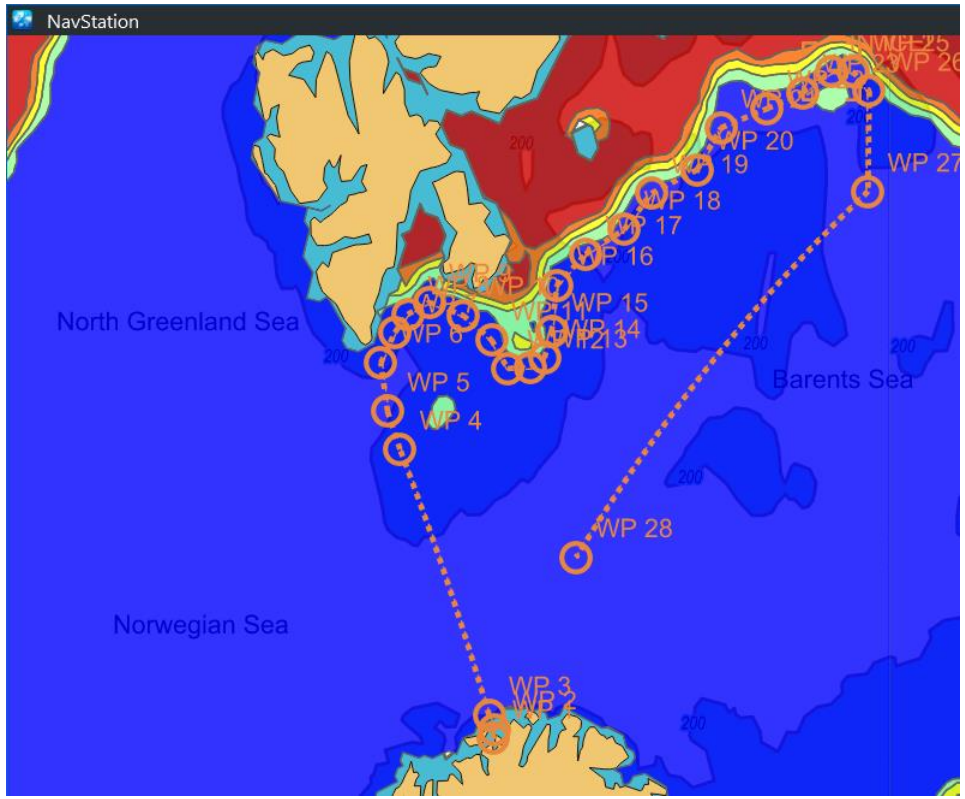
NAVTOR wold like to see Copernicus becoming an **EURPEAN METOC CAPACITY (EuMe)**

NAVTOR e-Navigation made easy

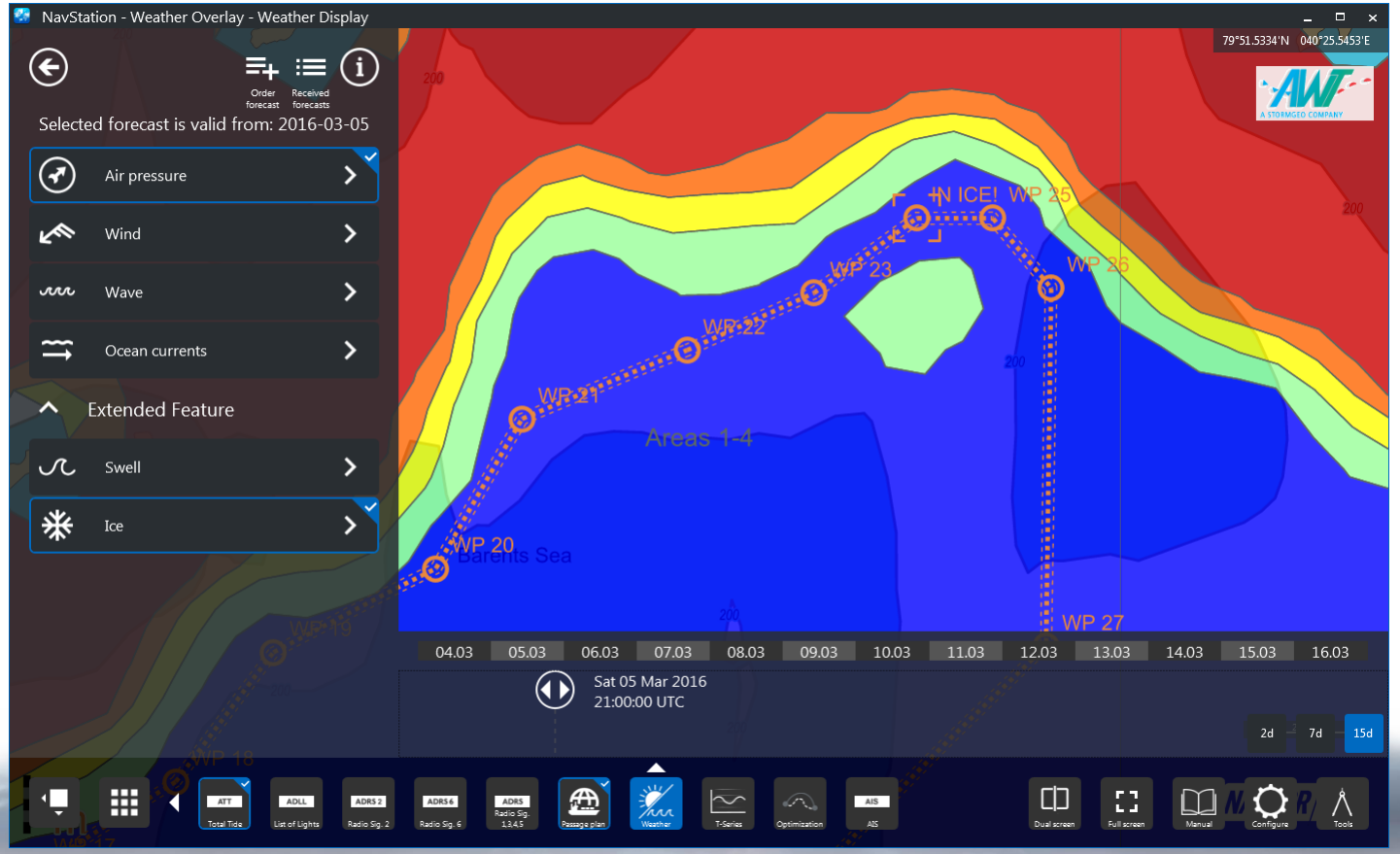
Looking into Copernicus services

- Evaluating **Sea Model**; **“GLOBAL OCEAN 1/12° PHYSICS ANALYSIS AND FORECAST UPDATED DAILY”**
  - monthly mean files
  - hourly mean surface fields for sea level height, temperature and currents
- Evaluating Sea Surface **observations** of Wind, Wave and Current
- Evaluating **Sea Ice** information; observations and models

Passage Planning based on dynamic Ice Coverage

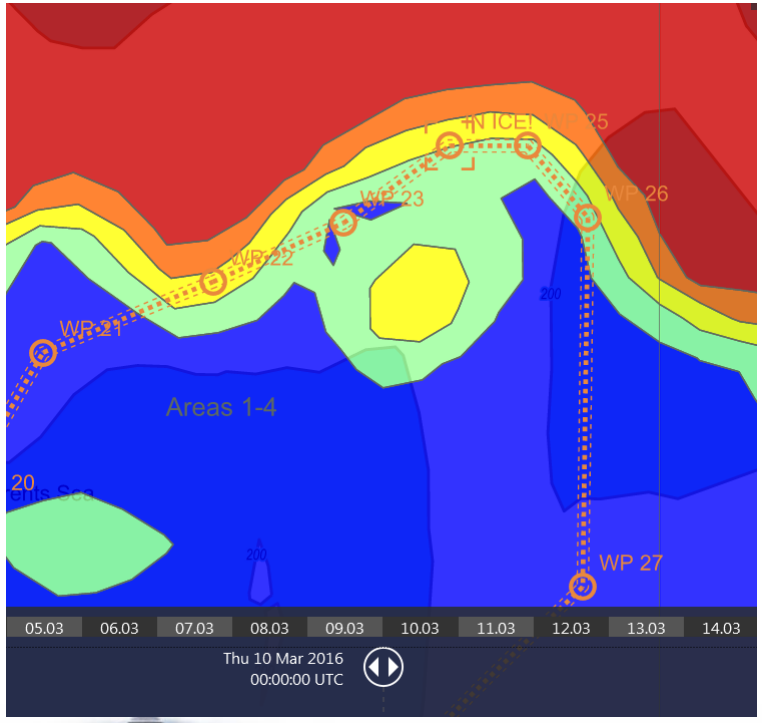


Seems fine for a Cruise vessel…?

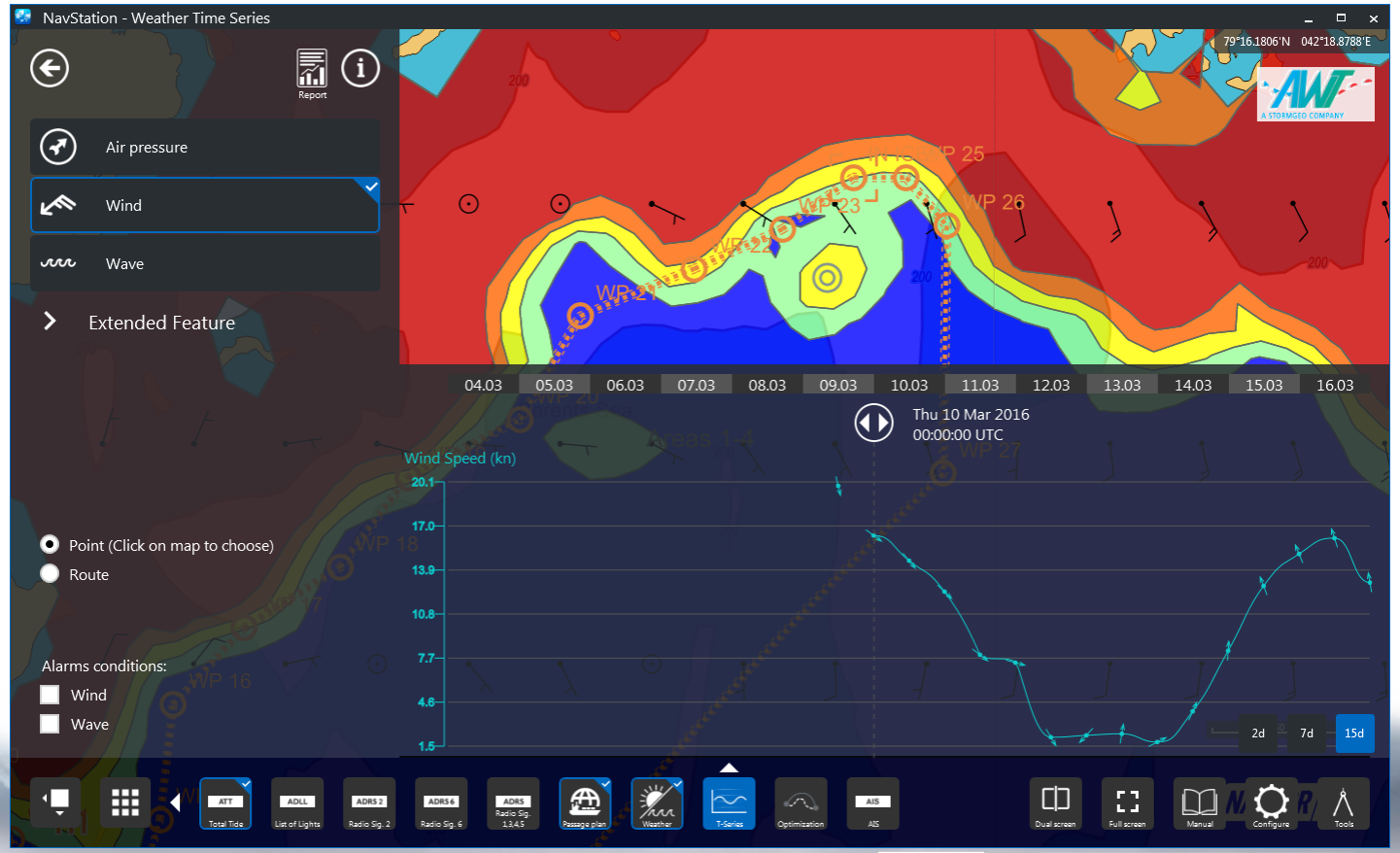


Passage Planning based on dynamic Ice Coverage

After a few days the ice is closing.



Ice Coverage overlay wind forecast, timeseries in lower graph..



Russia Willing to Pay to Lure Shippers to the Arctic

October 21, 2019 by Bloomberg

https://gcaptain.com/russia-willing-to-pay-to-lure-shippers-to-the-arctic

gCaptain

To deliver a cargo via the Northern Sea Route today, a shipping company needs an ice-class vessel or an icebreaker and to pay insurance costs more than twice those for the Suez Canal, according to Russia's Deputy Minister of the Far East and Arctic Development Alexander Krutikov.

His ministry is working on a project to create a state-run container ship operator. The company would cover the cost of any risks associated with transporting international cargoes via the Arctic's icy waters, including possible delivery disruptions and higher insurance payments.

Possibilities and challenges

using Copernicus products e-Navigation applications

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NAVTOR wold like to see Copernicus becoming an
EURPEAN METOC CAPACITY
(EuMe)

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Thank you!

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e-Nav Manager NAVTOR A/S