



KYSTVERKET  
NORWEGIAN COASTAL ADMINISTRATION

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# The Use of digital communication technology in VTS

## Norwegian approach

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Richard Aase, Senior Engineer  
Tokyo, March 12th 2019



# The Norwegian Coastal Administration

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- National agency for safe navigation, coastal management and preparedness against acute pollution.
- An advisory and executive agency of the Ministry of Transport and Communications.
- Facilitates shipping as an *efficient*, *reliable* and *green* transport option.



Director General  
Einar Vik Arset



# Overall goals and vision

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- Promote safe and efficient seaways.
- Ensure sufficient width and depth in the fairway.
- Prevent marine accidents and acute pollution.

## VISION:

To make our coast and waters the safest and cleanest in the world.



# Vision and Goals

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- Our vision is to make our coast and waters the safest and cleanest in the world.
- Our goals are to:
  - Facilitate navigability and contribute to efficient and competitive shipping.
  - Ensure safe voyage in Norwegian waters and oceans to prevent accidents.
  - Limit climate emissions and reduce the environmental impacts of shipping.
  - Prevent and limit environmental damage caused by acute pollution.



# Main areas of responsibility

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- Maritime safety.
- Maritime infrastructure.
- Transport planning and coastal zone management.
- Emergency response to acute pollution.
- ISPS



# International work

- Participates in a number of international forums on maritime issues.
- Contributes to the development of policies and framework for safety at sea and maritime transport.
- Promotes Norwegian competence on maritime issues.
- Main cooperating partners:
  - International Maritime Organization
  - IALA (International Association of Marine Aids to Navigation and Lighthouse Authorities)
  - European Maritime Safety Agency
  - EU/EEA
  - BPAC (The Baltic Pilotage Authorities Commission)
  - PIANC (Permanent International Association of Navigation Congresses)
  - IAPH (International Association of Ports and Harbours)



# Areas for research and development

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- ITS (Intelligent Transport Systems)
  - Communication between systems on board and ashore
  - Holistic, automatisisation
  - ITS Norway – forum for inter-agency cooperation (rail, road, sea, air transport)
- e-navigation
  - IMO initiative, SIP coordinated by Norway
  - Provide needed information, in electronic format, to a ship's bridge team to enhance the safety and efficiency of marine navigation.
  - Simplify the exchange of information between systems on board and between ships, and on shore.





# Climate and Environmental Strategy

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- Ensure that we protect the environment when carrying out our tasks.
- Prioritized areas:
  - Promote the social and environmental benefits of maritime transport.
  - Work to reduce climate change and environmental impacts of shipping and ports.
  - Safeguard a dynamic emergency response to acute pollution.
  - Work systematically with environmental issues within our own organization.
  - Take responsibility for the environmental impact of our organization.





# Maritime Services

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- For improved and efficient safety and transport at sea:
  - Pilot service.
  - Vessel Traffic Service.
  - Messaging and Reporting services.



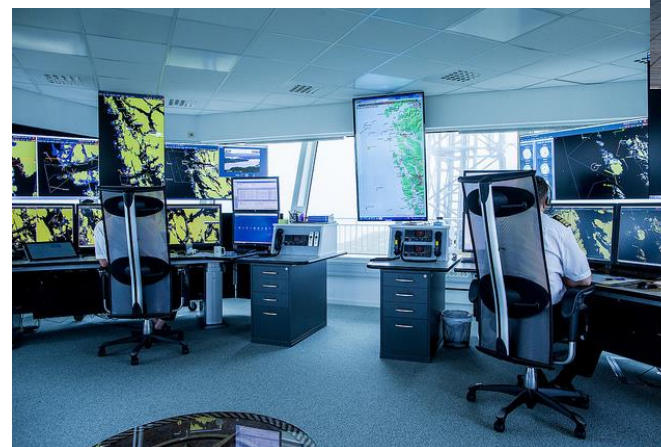
# Vessel Traffic Services

- Prevents accidents and facilitates safe and efficient traffic in coastal areas.
- Offer services such as traffic control, information and navigation assistance to shipping.
- Monitors traffic using digital aids such as radar, camera, weather stations, VHF and AIS.
- Operational 24 hours a day - all year round.

## VESSEL TRAFFIC SERVICE CENTRES



# VTS

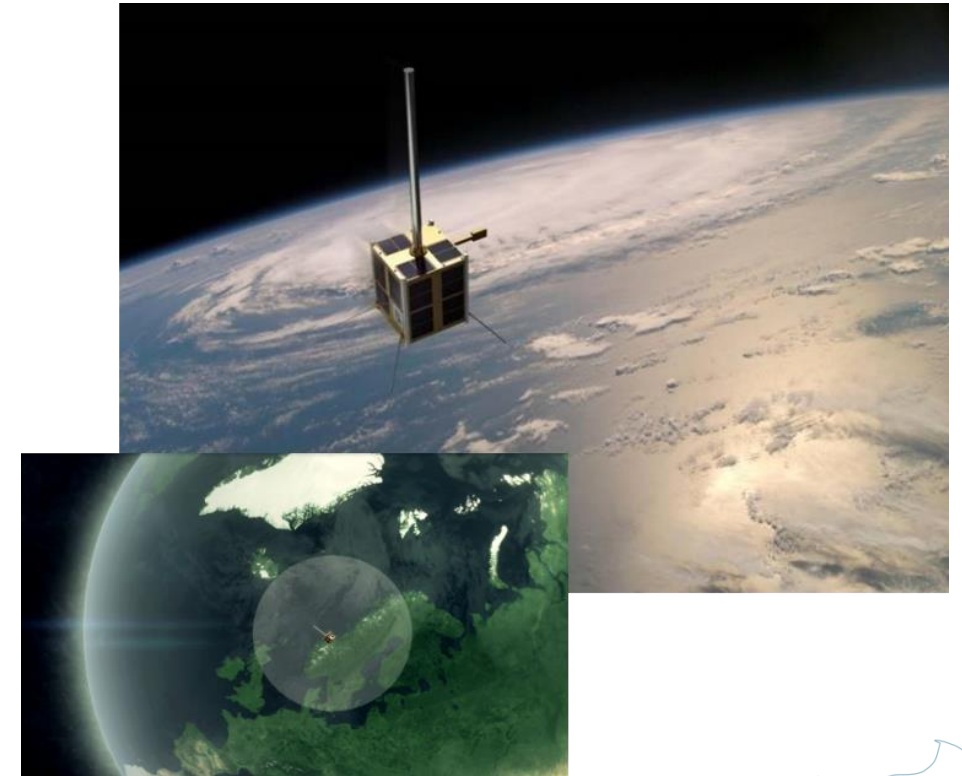




# Reporting and Information Services

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- Development and operation of:
  - Map service “Kystinfo”
  - Database for statistical ship traffic monitoring “Havbase”
  - NAVAREA XIX Warnings
  - National port overview
  - Navigational Coastal Warnings (NAVCO)
  - Radio Navigation (DGPS)
  - Land-based AIS
  - Satellite-based AIS
  - Long Range Identification and Tracking (LRIT)
  - SafeSeaNet Norway ship reporting system
  - Wave and Current forecasts
  - Ice Service

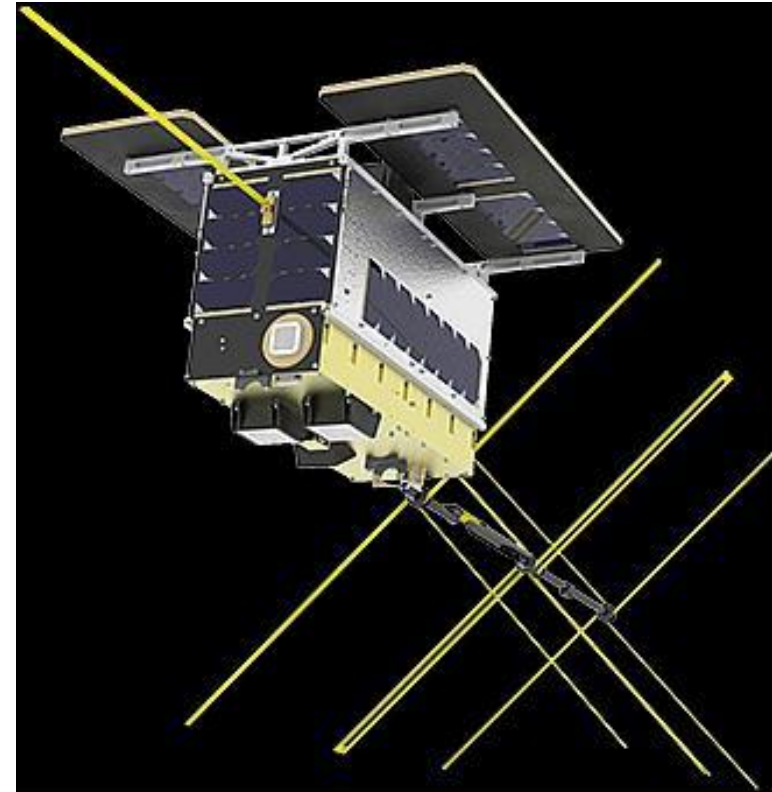




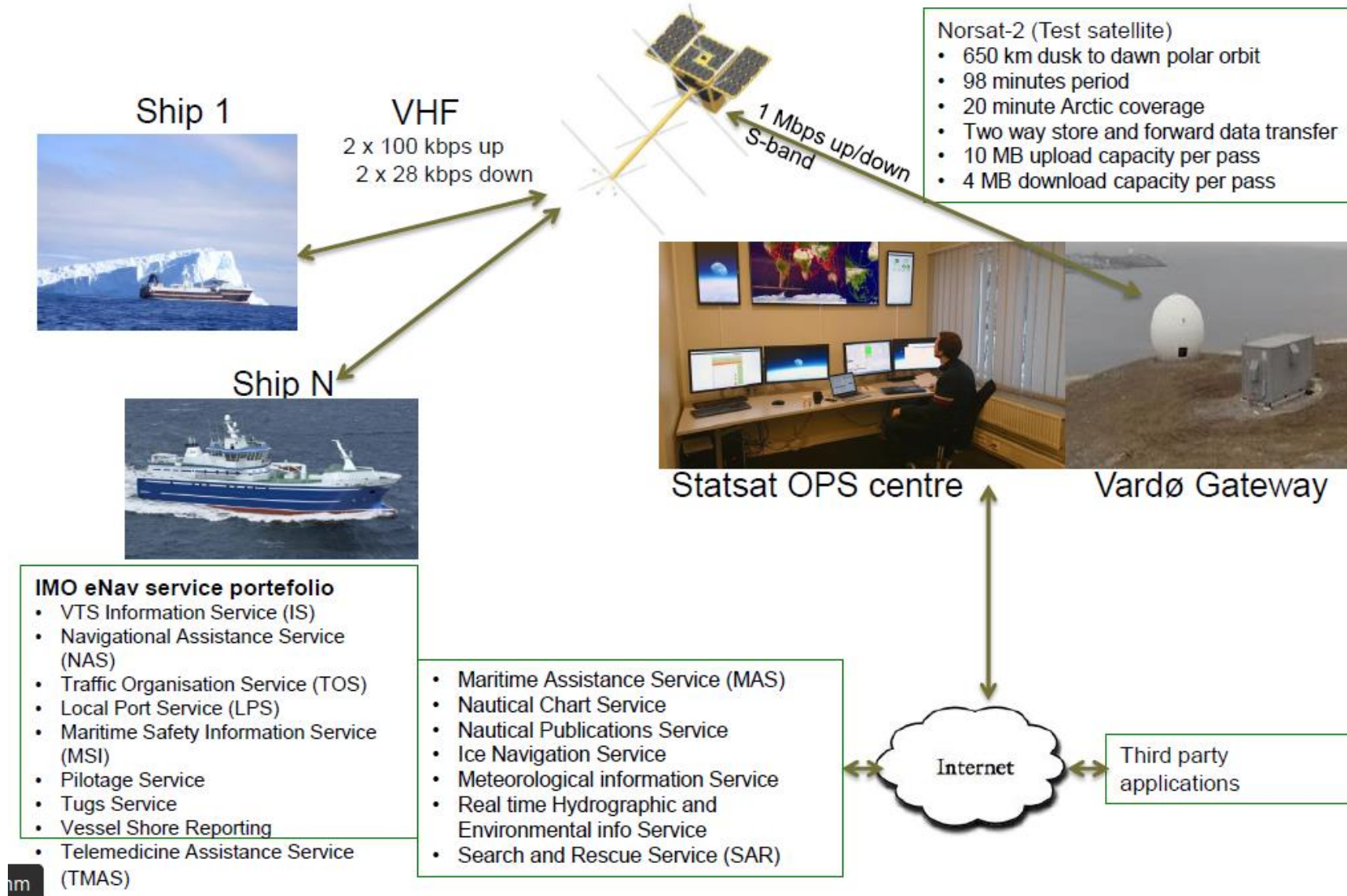
# AIS – Automatic Identification System

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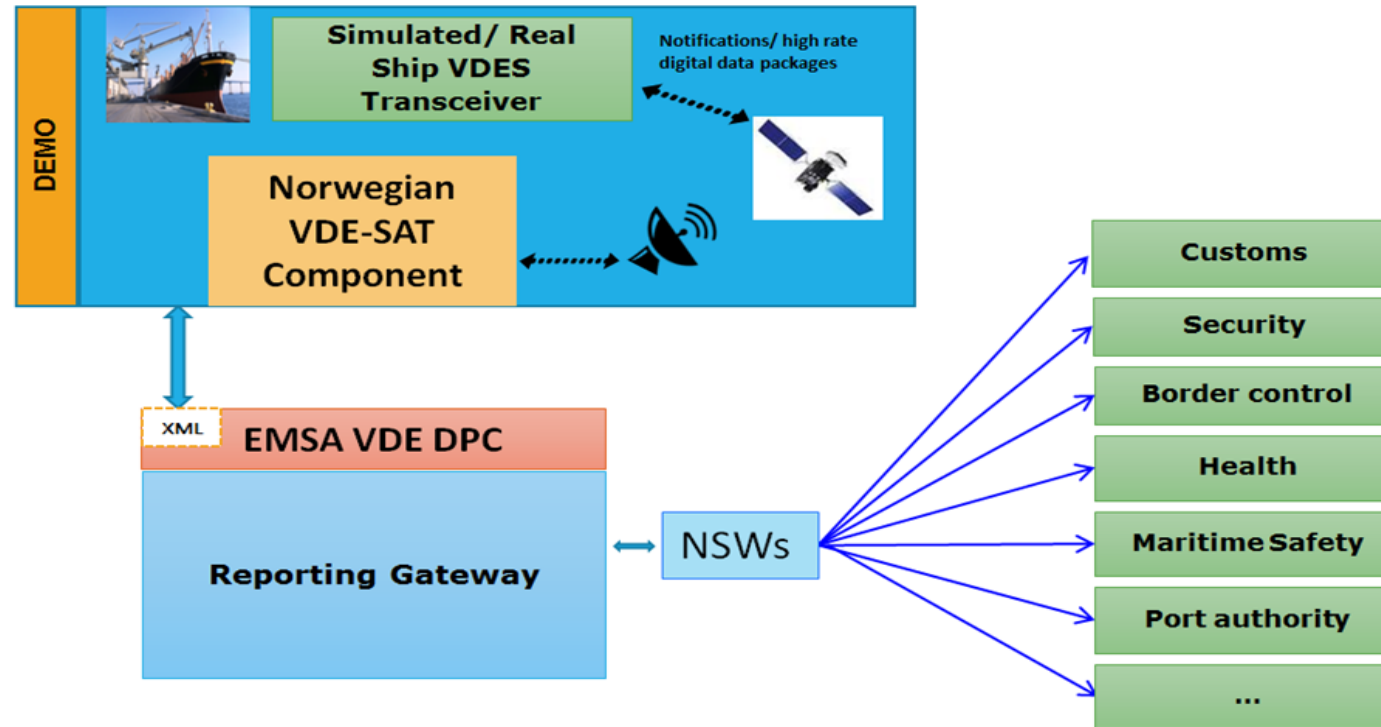
- Ground- and satellite based
- 50 ground based stations covers coastal areas
- AISSat-, AISat-2, NORSAT 1 and 2 with global cover
- AISSat-3 to be launched in 2018
- Inter-agency cooperation – SAR, police, military, customs, fisheries



# Future Arctic VHF Data Exchange Satellite System



# Distribution of digital data packages to NSWs via EMSA's Reporting Gateway

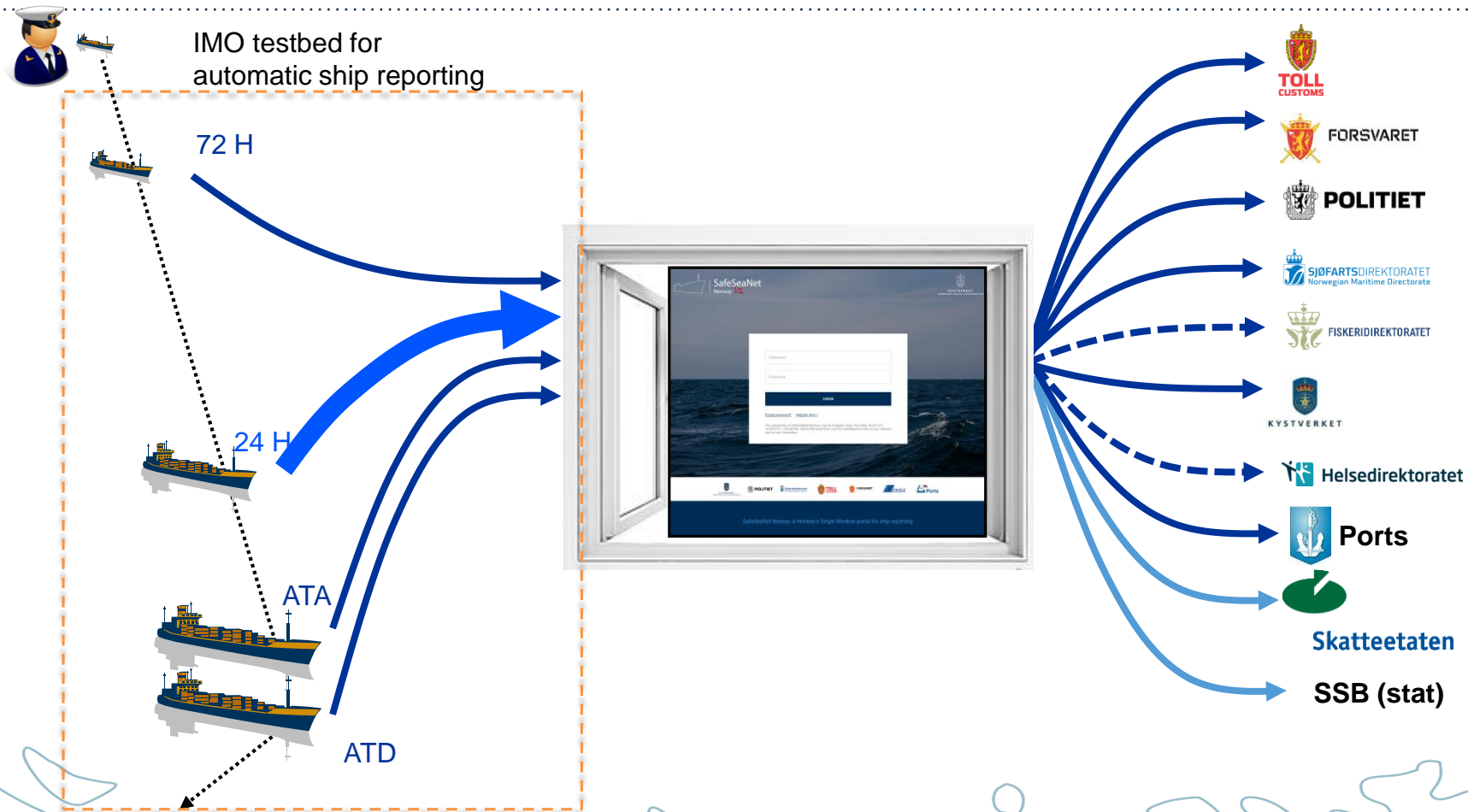


– Vi tar ansvar for sjøvegen



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# Maritime Single Window (SafeSeaNet Norway)



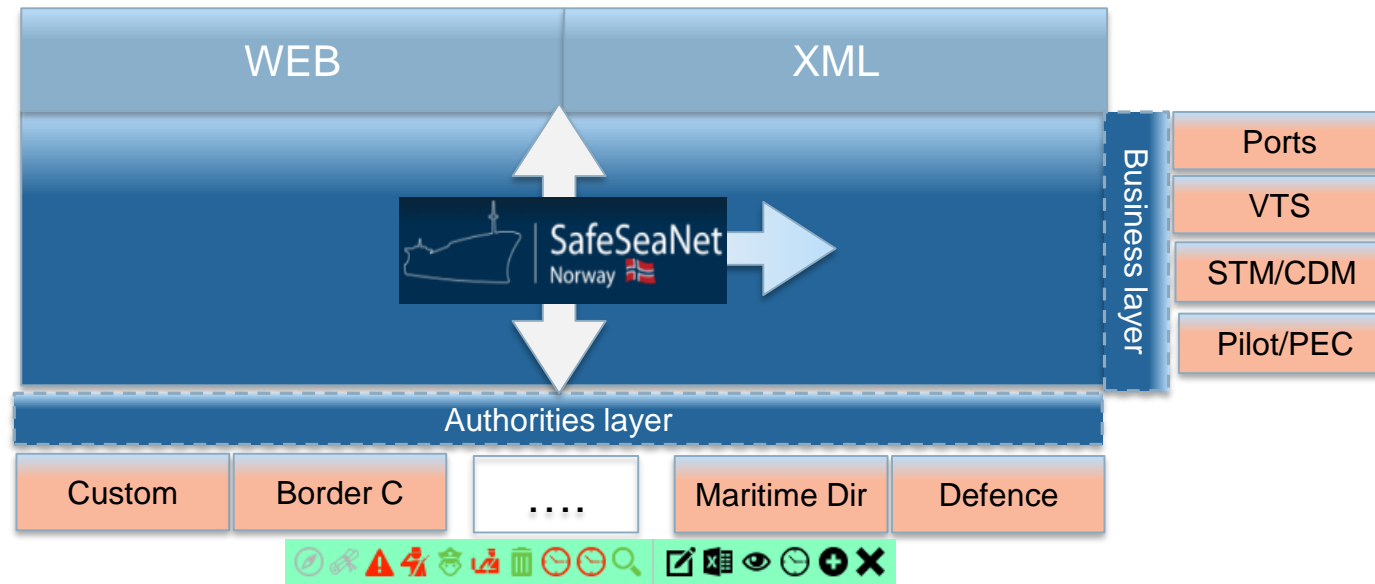
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# Norwegian Single Window (SSNN)



– Vi tar ansvar for sjøvegen



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# Automatic Reporting testbeds

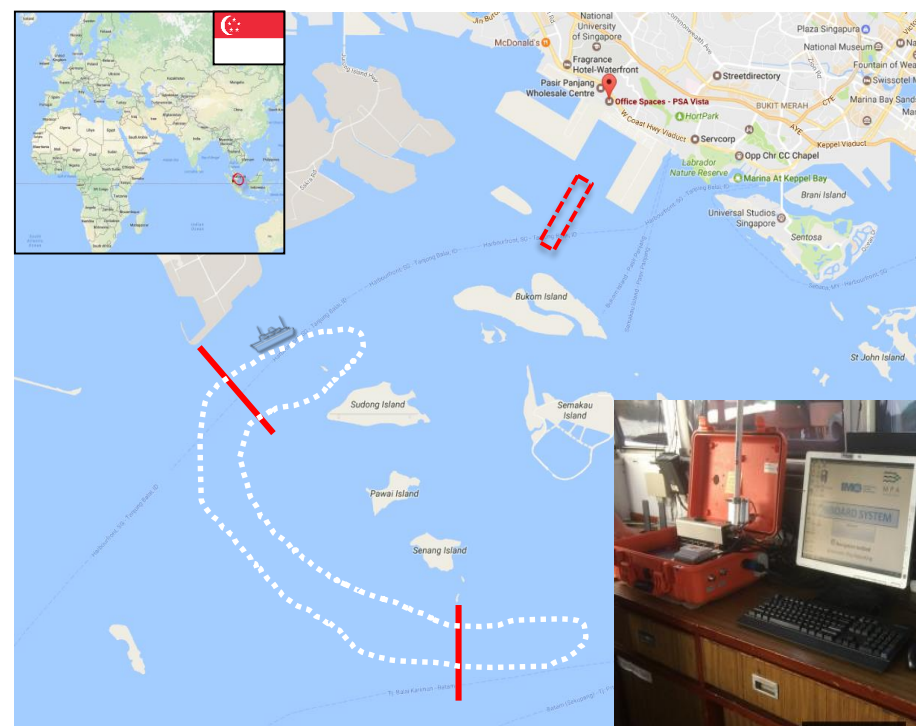
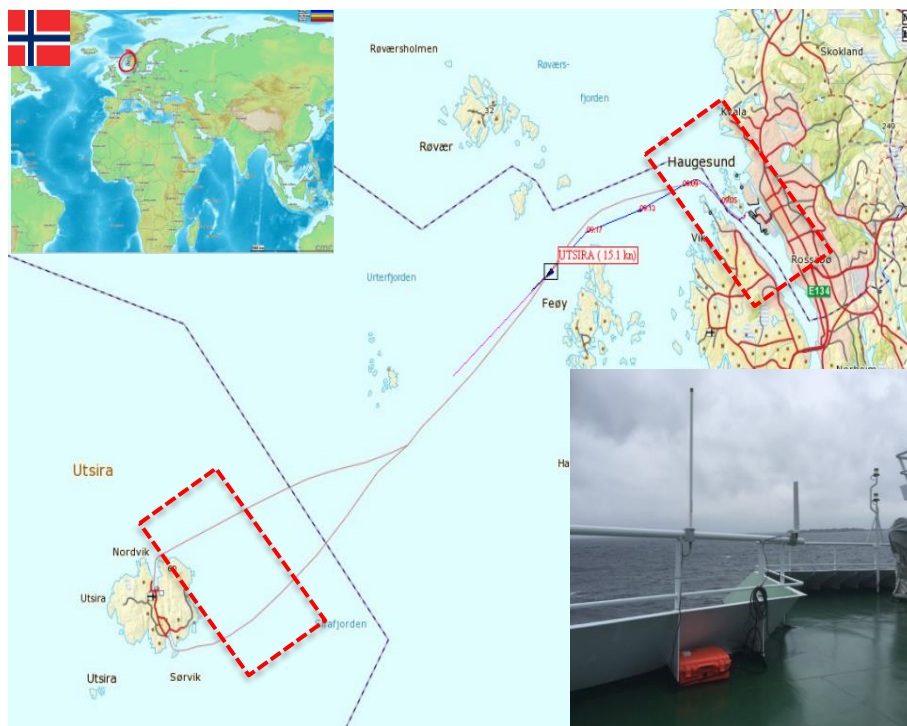
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- **Norway** - 2<sup>nd</sup> half 2016
  - 1<sup>st</sup> generation HW/SW/concept
  - VDES and mobile communication
  - Single Window integration
  - Ship<sup>2</sup>Shore & Shore<sup>2</sup>Shore
- **Singapore** - February 2017
  - 2<sup>nd</sup> generation HW/SW/concept
  - VDES and mobile communication
  - Ship<sup>2</sup>Shore



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# What & Where ?

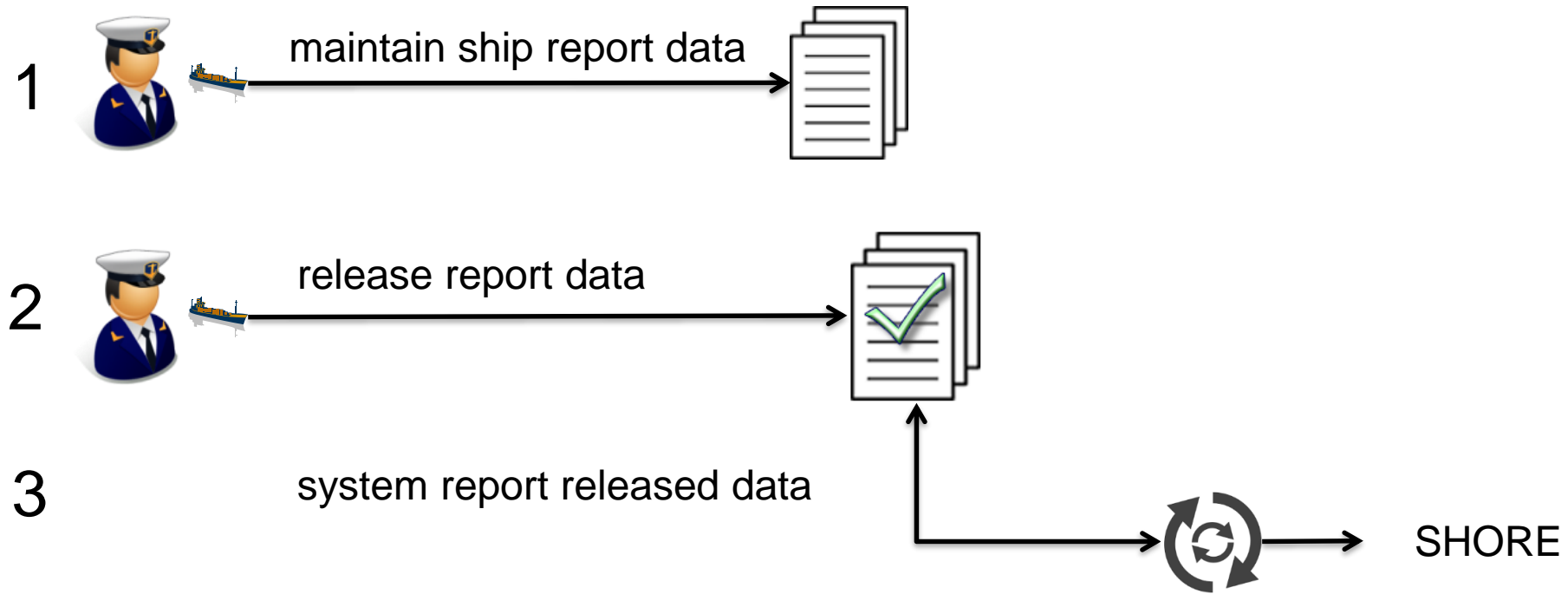


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# Reporting principle





## Annex 3



# Conclusions

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- ✓ Results from the testbeds shows that *Automatic Reporting* is a central part of the future
- ✓ VDES will play an important role in the communication for *Automatic Reporting*
- ✓ Technical and operational concepts for reporting needs to be further developed
- ✓ Focus on standards, harmonisation and security



# (potential) way forward

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## ➤ Digitalization, Automation and Single Window

- ✓ Further explore concepts for ship reporting
- ✓ Use experience to develop 3. generation
- ✓ Harmonisation
- ✓ Integration

## ➤ Enhanced business models

- ✓ value adding activities and services

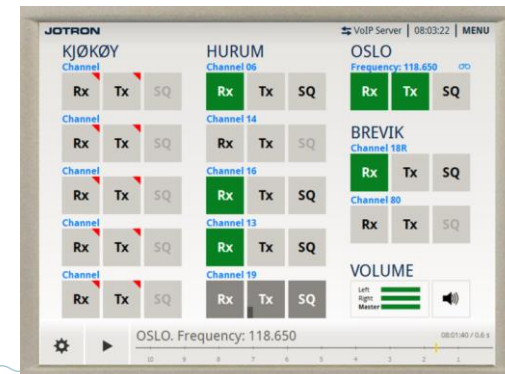
## ➤ Commercialize

- ✓ Off the shelf HW (and SW)
- ✓ Prototype 1. gen Automatic Reporting product



# VHF

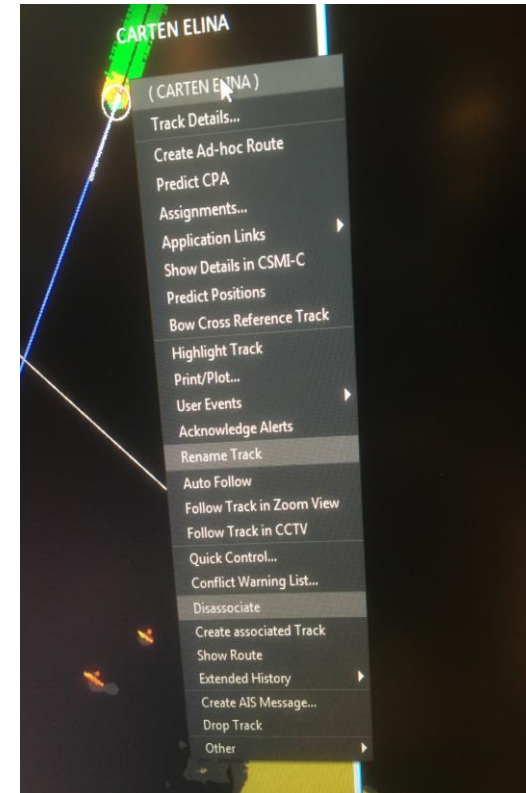
- Text to speech
  - Written text can be scheduled in intervals to do public read-outs
- Speech to text
  - Communication on VHF can be typed by system to a text file, time-synchronized with track information
- DSC
  - From VTS System, DSC messages is sent to a vessel by right click
  - Automated DSC messages is sent when crossing a line in the map
  - Investigating possibility to get information (poll) from radio and display as track in VTS System
    - MMSI
    - Position
    - Active radio channel/frequency
    - Communication on channel/frequency





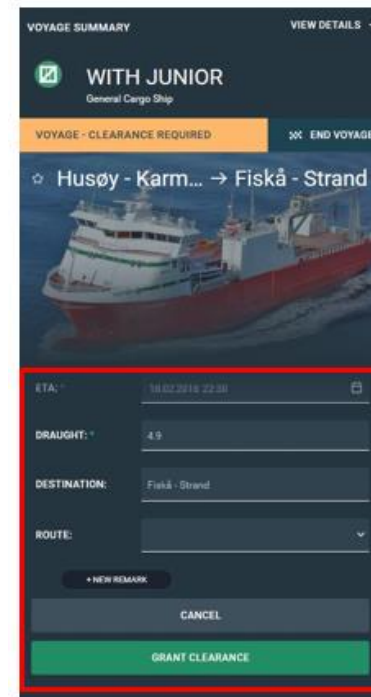
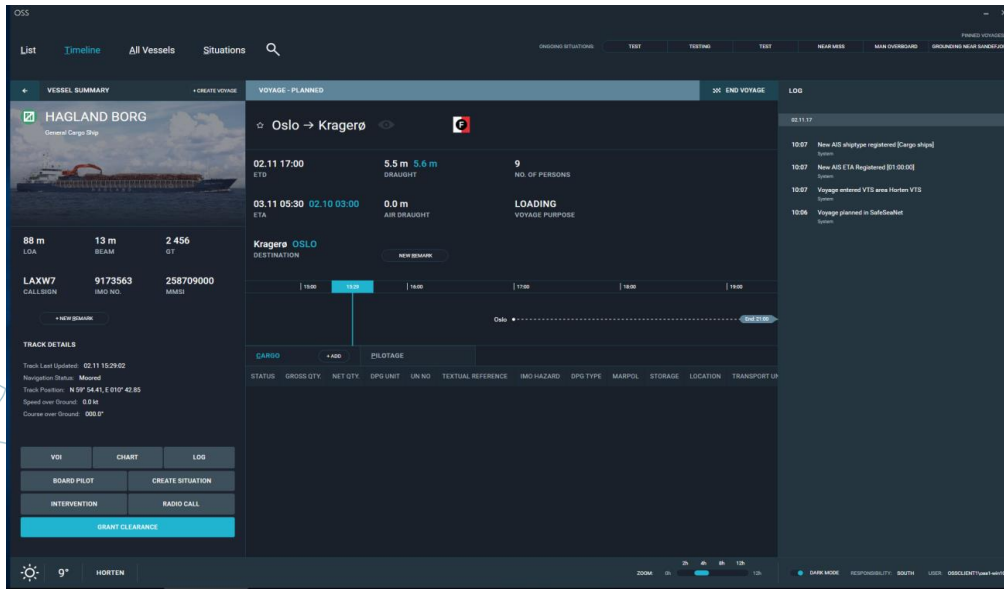
# CSCOPE

- GIS tool to ensure VTS picture
- Combines available sensor data
- Communication options
  - AIS messages
  - Virtual ATon
  - DSC



# OSS

- Get information directly from Single Window
  - Clearances
  - Route information and approval
  - Situations



# OSS Background

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- A common decision support system for all VTS' in NCA
- Built on operational input and need



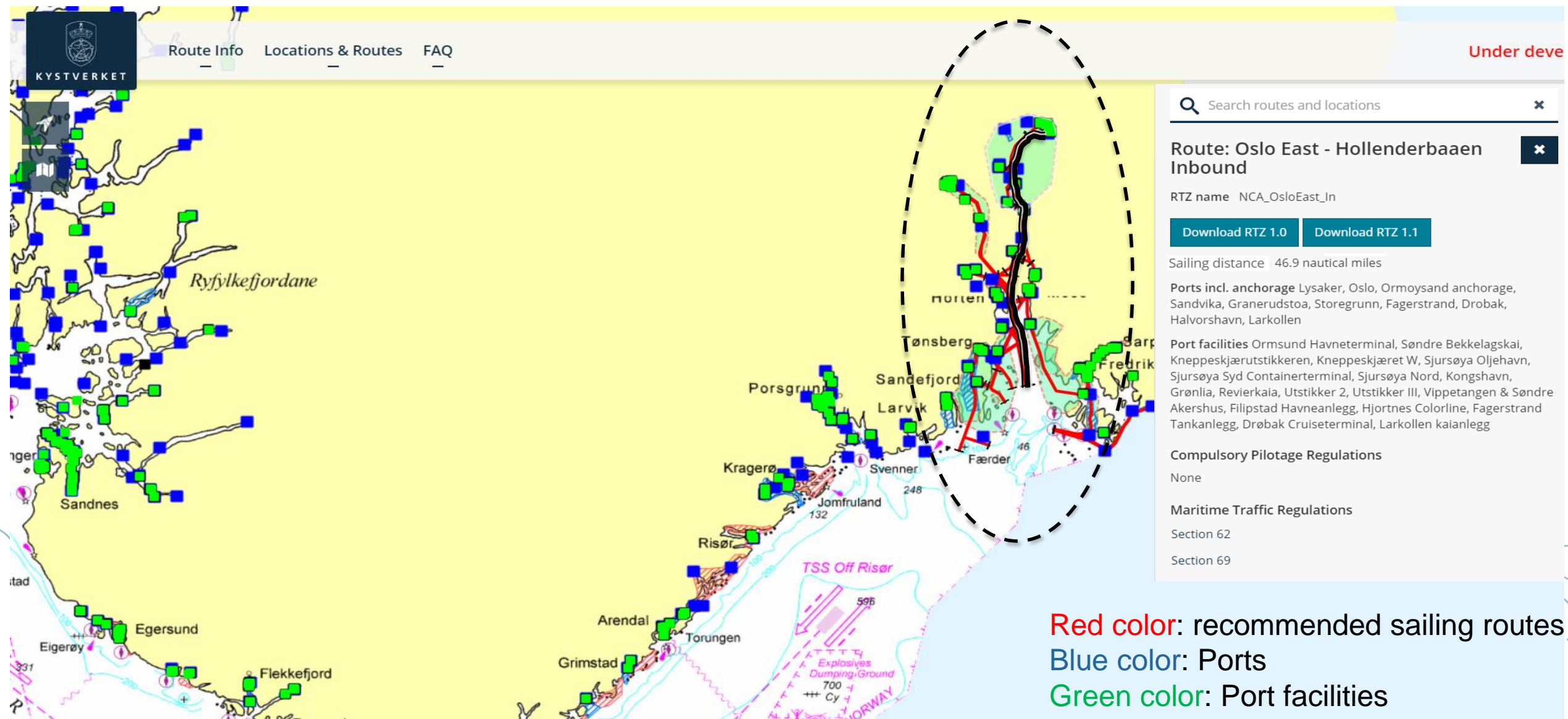
# BEhavioral ANalysis (BEAN)

- An automated system for timely identification of anomalous situations at sea.





# Ex: Sailing route to Oslo East is selected



# GIS



# ECDIS

## Information technology

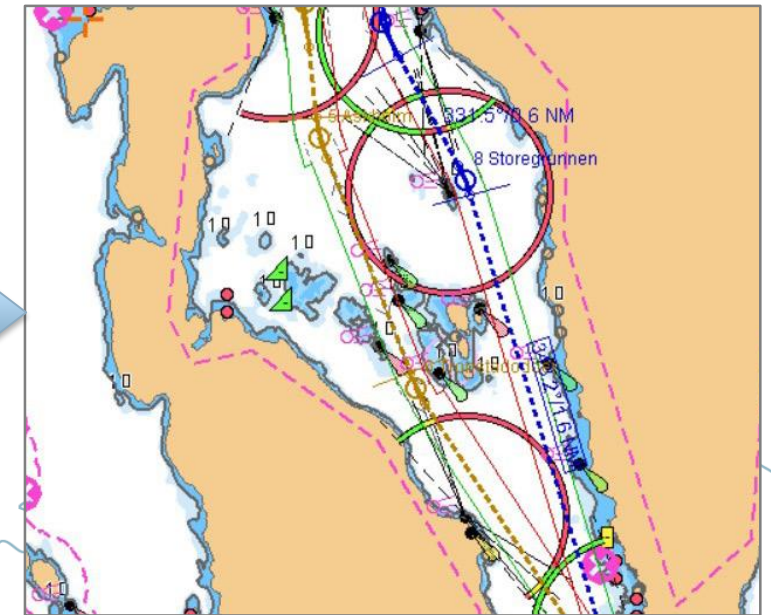
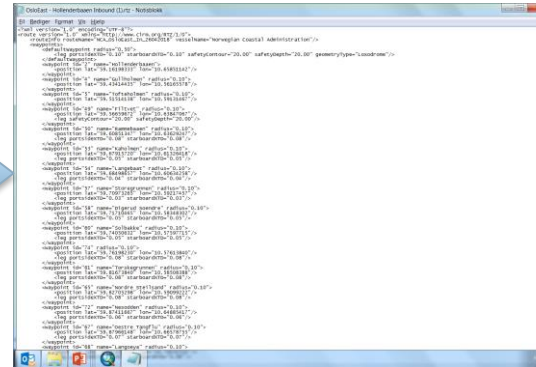
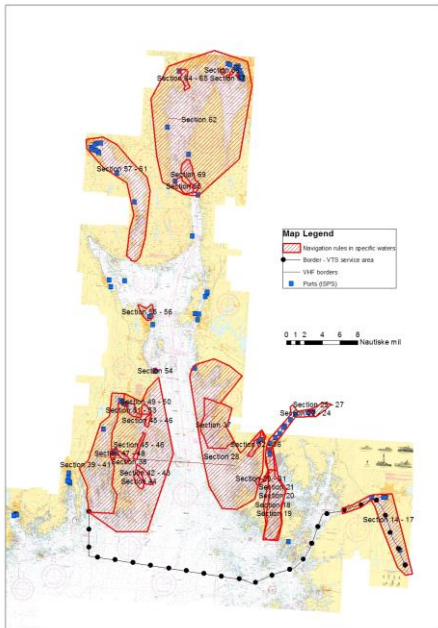
Information-management and tools in web-based Geographical Information Systems (GIS)

## Operational technology

- Nautical information in Electronic Chart Display and Information System (ECDIS)

## Route

(rtz and other international standards)



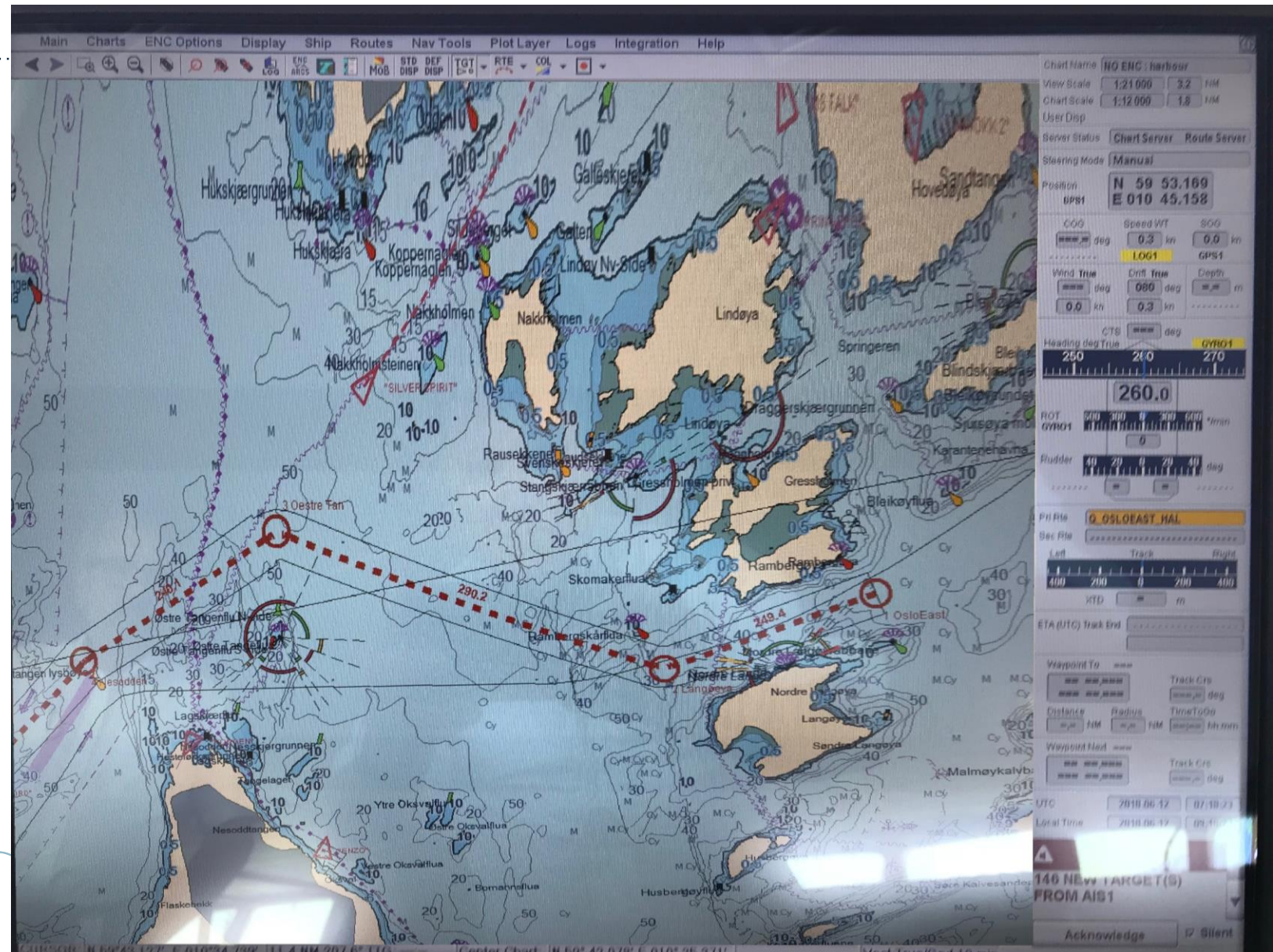
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The same  
sailing routes  
are integrated in  
ECDIS  
(exchanged  
from GIS to  
ECDIS)

NCA  
recommended  
and,  
NCA approved

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## Implementation of The Digital Voyage

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Quality check and  
assurance of usability for  
operationalization

The NCA-representative  
and the captain (to the  
right) on board







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NORWEGIAN COASTAL ADMINISTRATION

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# CLEAN, SAFE AND EFFICIENT SEAWAYS

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**[www.kystverket.no](http://www.kystverket.no)**

