

Status of e-Navigation

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President

Industry Member



9 February 2015

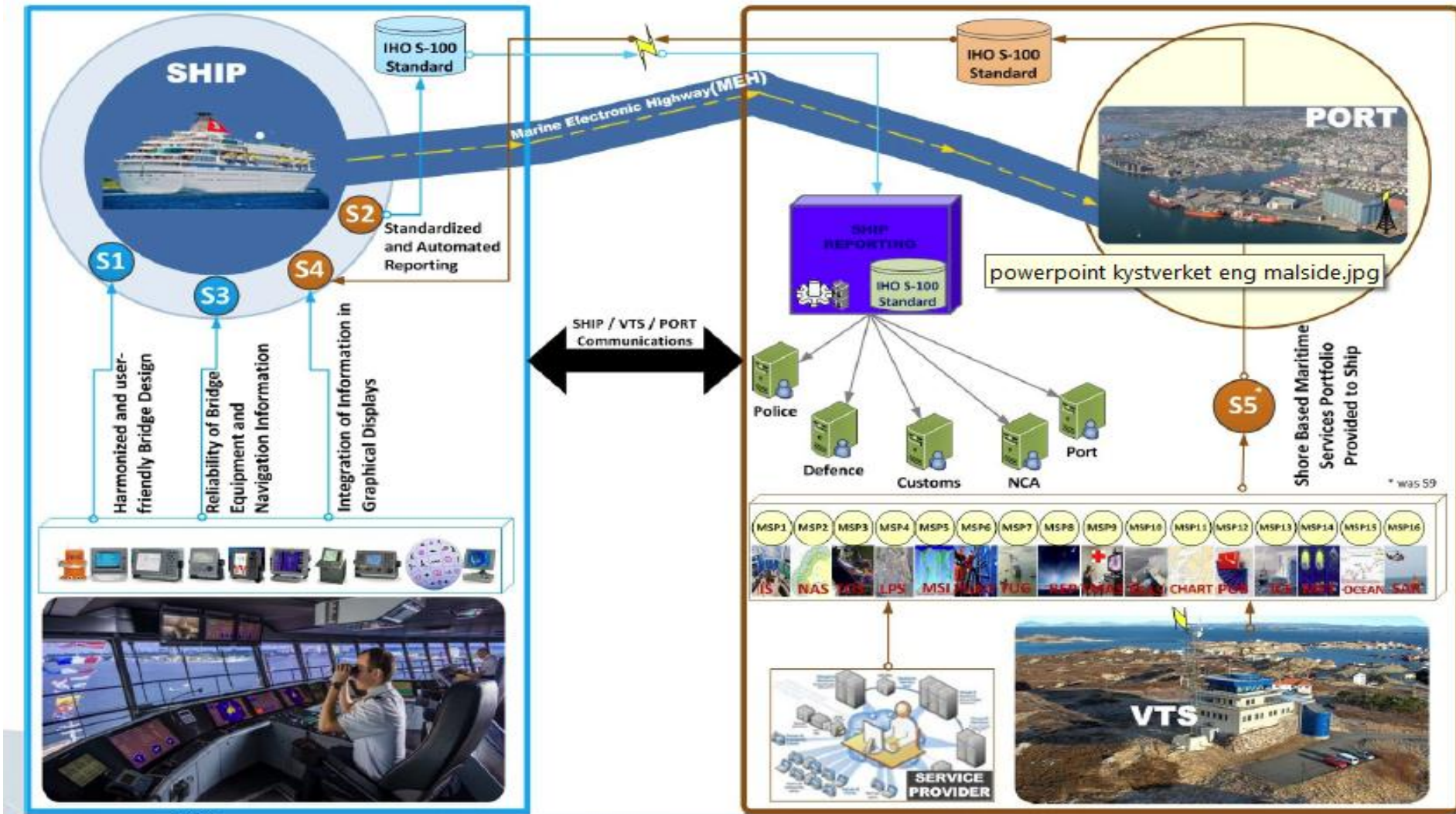
The Initial Concept

- Need for “broad strategic vision” to:
 - Incorporate new technologies in a structured way
 - Ensure use is compliant with various electronic navigational and communication technologies and services already available
 - Development of an overarching system with the potential for global coverage this is accurate, secure and cost effective
 - Based on user needs
 - Intent was not to change how ships are navigated – rather to provide seafarers more time to navigate and to make better use of the equipment already on board ship
- (Source: Alan Blume at e-Navigation Underway 2015)
- e-navigation is about harmonised and simplified information exchange between systems on board and systems on shore and systems between other ships.
- (Source: John Eric Hagen at e-

Navigation Underway 2015)



Current e-Nav Concept



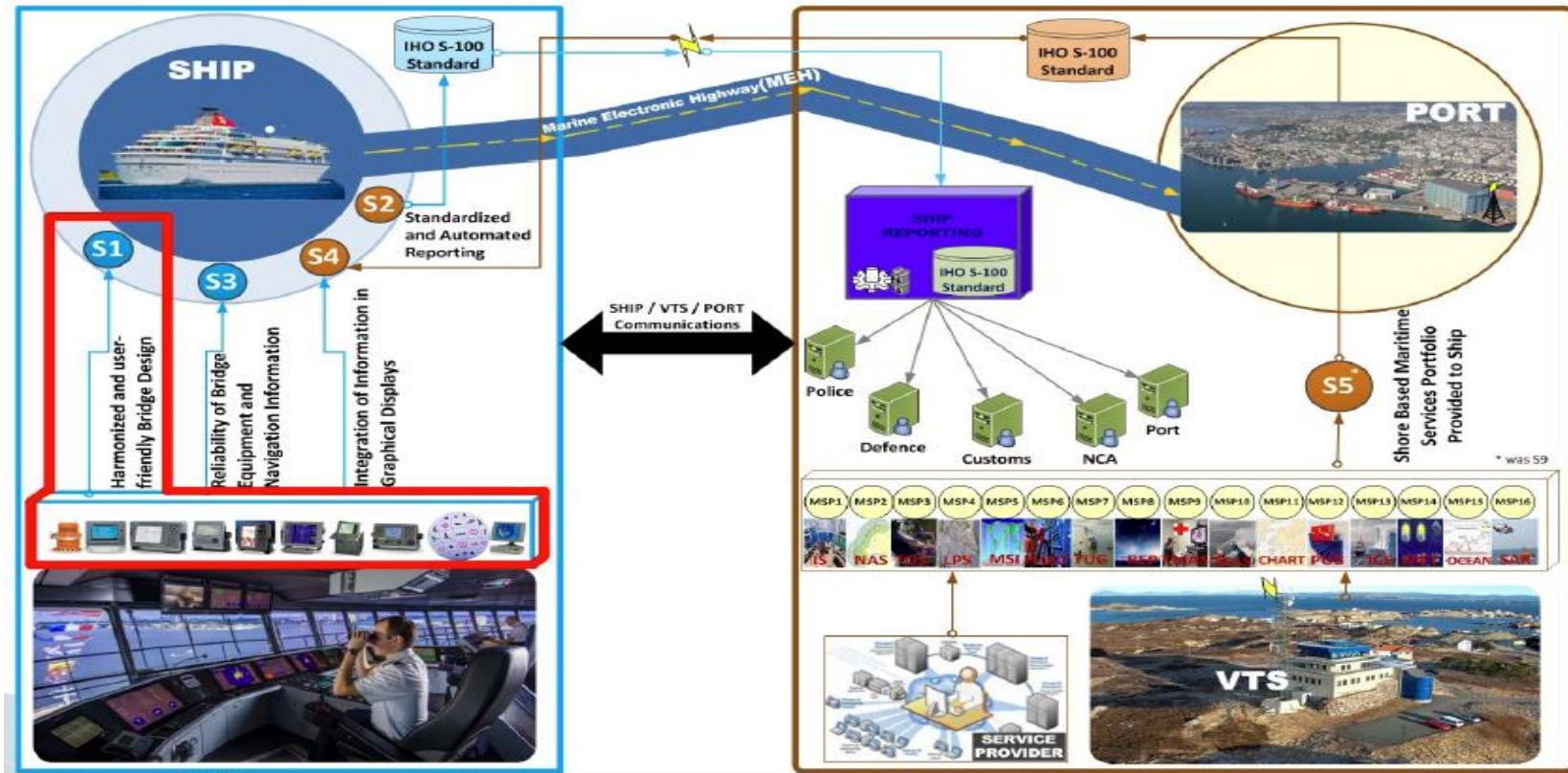
Source: John Eric Hagen at e-Navigation Underway 2015

IMO Status

- NCSR 1 finalized the “Strategic Implementation Plan” (SIP -
- MSC 94 approved the Strategic Implementation Plan but refrained from including e-navigation on the Organization’s work plan pending further consideration at MSC 95
- Member States invited to submit proposals to MSC 95 to:
 - Reduce the number of outputs
 - Specify the intended output in SMART terms
 - Prepare a comprehensive prioritized plan of work and the time required to complete each item

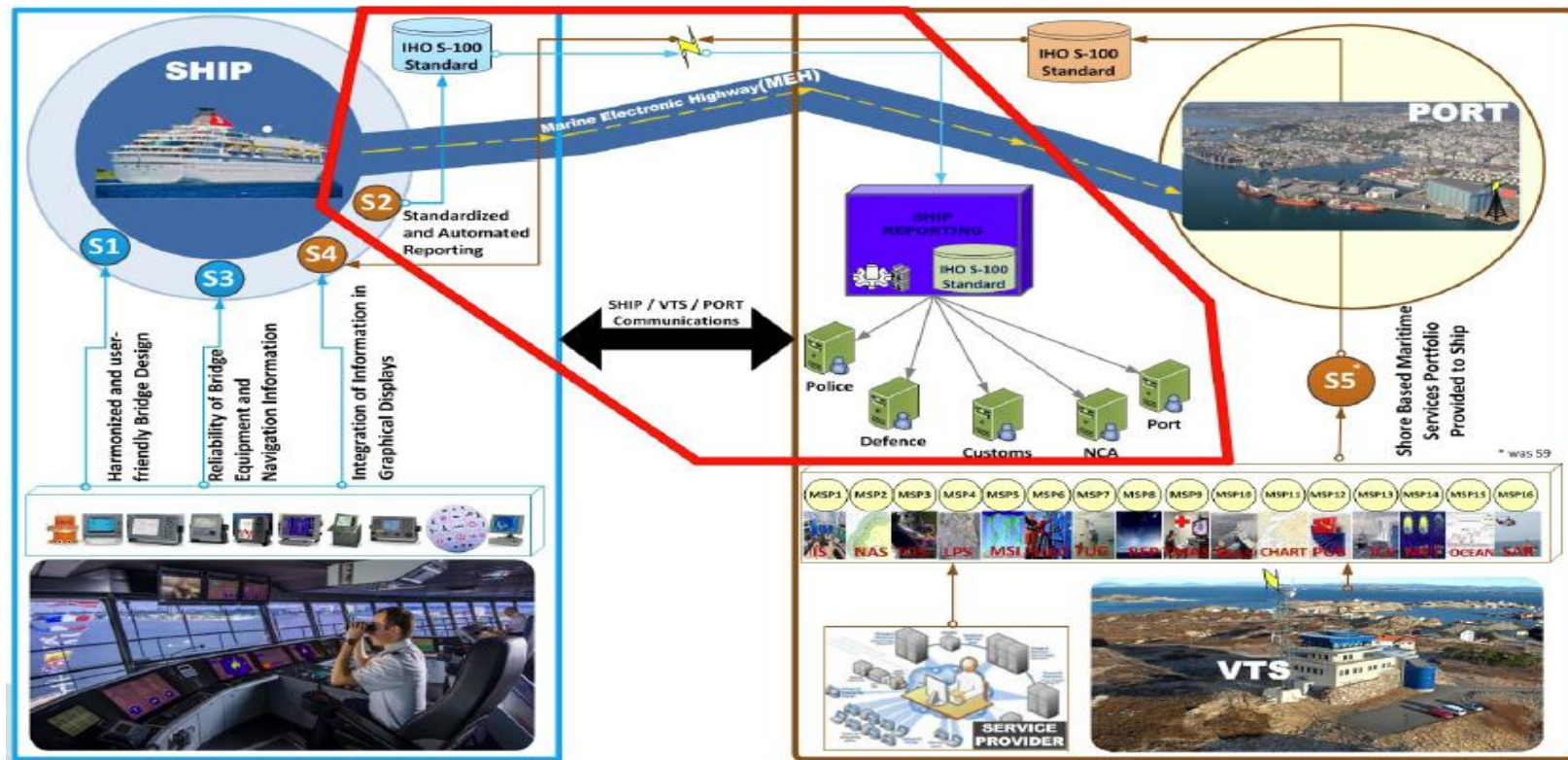
SIP Solution 1 – Harmonized Bridge Design

provide a harmonised and user friendly bridge design in order to ensure that the navigator can immediately recognize all the navigational functions on any ship.



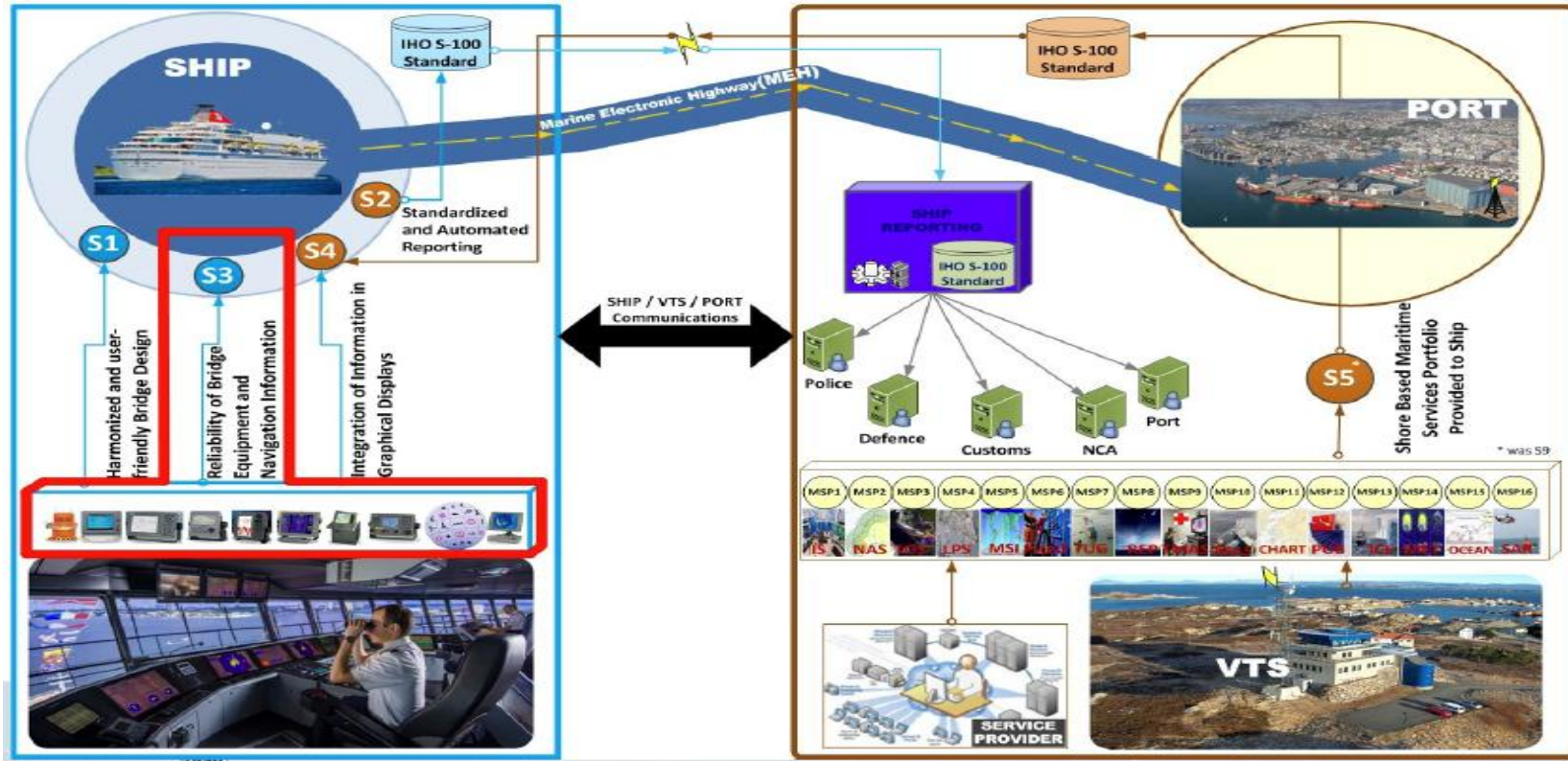
SIP Solution 2 – Automated Ship Reporting

provide standardised and automated reporting of ships information for port arrival to the shore side, so that it is not necessary to use many individual ship reporting systems when arriving in a port, saving time and reducing the non-navigational workload of the navigator and increasing port efficiency



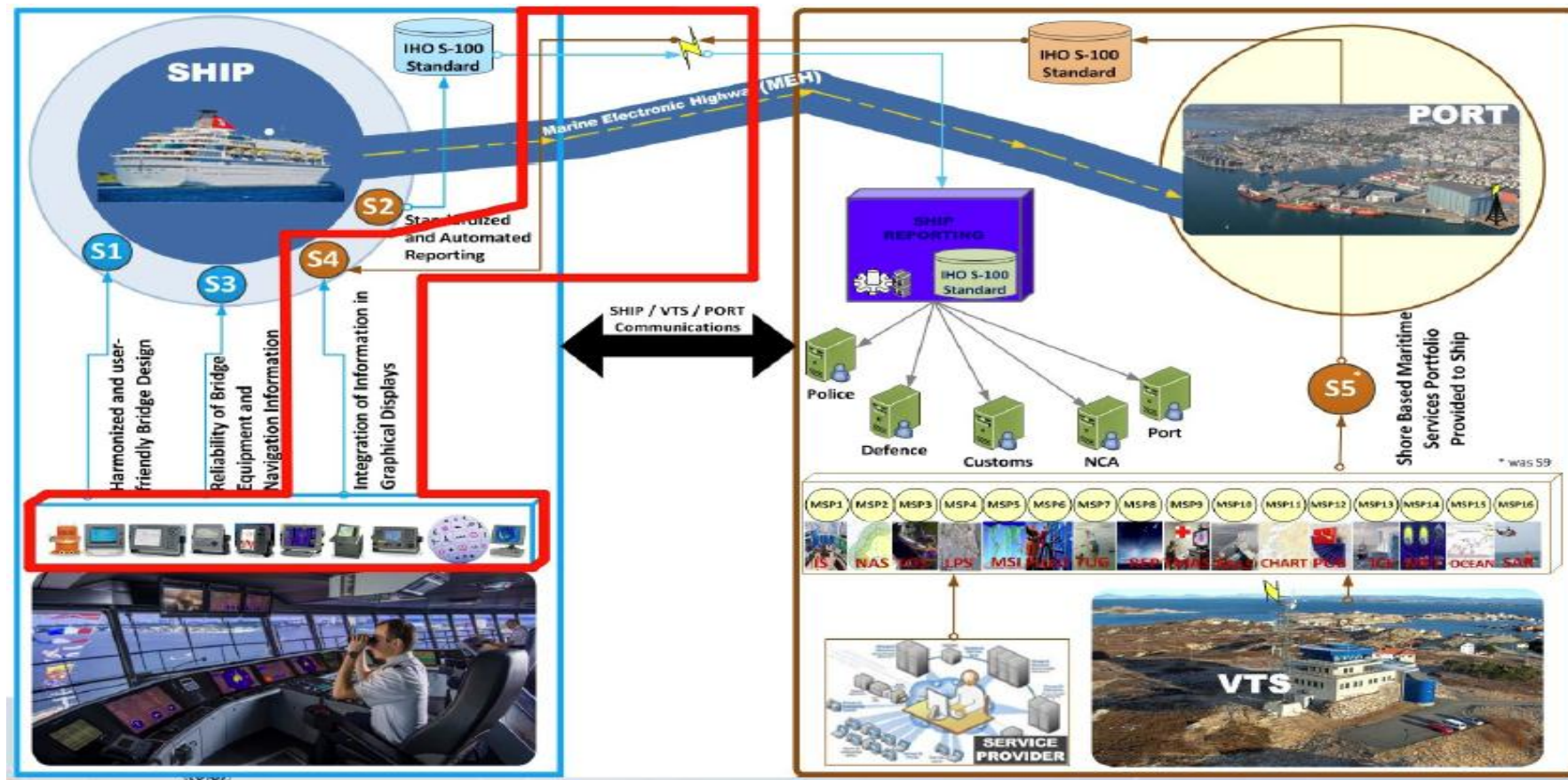
SIP Solution 3 – Reliable Navigational Information

provide improved reliability of bridge equipment and navigation information in order that the navigator can rely on the continuous update of the ships situation with regards to navigational awareness.



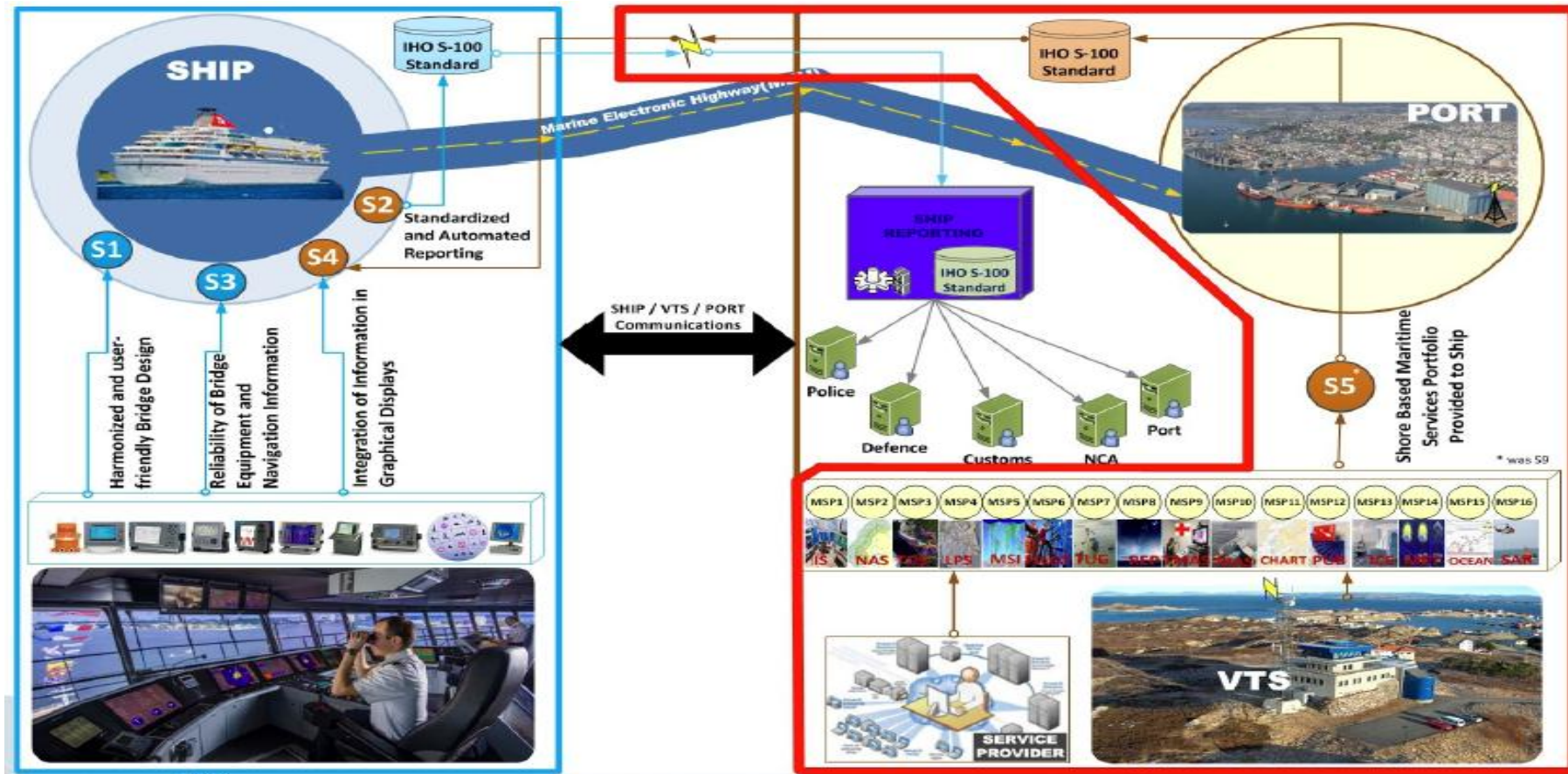
SIP Solution 4 – Integration of incoming Information

provide integration of incoming information on bridge navigational graphical displays to avoid the need to plot additional information of the current situation of the ship.



SIP Solution 9 – Harmonization of Shore Information

makes sure that the shore based information from ports, VTSs and other service providers to ships is harmonised and standardized around the world.



Marine Service Portfolio (MSP)

- MSP 1 - VTS Information Service (IS)
- MSP 2 - VTS Navigation Assistance Service (NAS)
- MSP 3 - VTS Traffic Organization Service (TOS)
- MSP 4 - Local Port Service (LPS)
- **MSP 5 - Maritime Safety Information (MSI) service**
- MSP 6 - pilotage service
- MSP 7 - tugs service
- MSP 8 - vessel shore reporting

Marine Service Portfolio (MSP)

- MSP 9 - Telemedical Maritime Assistance Service (TMAS)
- MSP 10 - Maritime Assistance Service (MAS)
- **MSP 11 - nautical chart service**
- **MSP 12 - nautical publications service**
- **MSP 13 - ice navigation service**
- MSP 14 - Meteorological information service
- **MSP 15 - real-time hydrographic and environmental information services**
- MSP 16 - Search and Rescue (SAR) service

5 Planned Outputs for IMO

- Update the current INS performance standards to make the INS suitable for use in a simplified and harmonised bridge design and to display information received from communications equipment
- Update the Guidelines on ship reporting to allow for electronic ship reporting, and the automated collection of internal ships data for reporting.
- Revise Resolution A.694(17 - to include BIIT (Built In Integrity Testing - especially for navigational equipment.
- Complete the guidelines for the harmonized display of navigation information received from communications equipment.
- Prepare a draft Resolution on the implementation of Maritime Service Portfolios (MSPs) after completing Guidelines with relevant International Organizations on the MSPs

IALA e-Navigation Activities

IALA e-Navigation Committee, structure

- WG 1 Harmonization
- WG 2 Implementation
- WG 3 Telecommunication
- WG 4 ENAV Services
- WG 5 PNT (Position, Navigation Timing)

IALA e-Nav Committee Working Groups

- **WG1 - Harmonization**
 - The development of internationally accepted and harmonized principles, concepts, data models, services and systems for e-Navigation.
 - Chair: Edward Hosken - Vicechair: Peter Hooijmans
- **WG2 - Implementation**
 - Center of excellence for sharing information on e-Navigation test beds. Monitor the e-Navigation strategy implementation to provide advice to IALA Membership on the implementation of e-Navigation.
 - Chair: Mahesh Alimchandani - Vicechair: Bill Cairns

IALA e-Nav Committee Working Groups

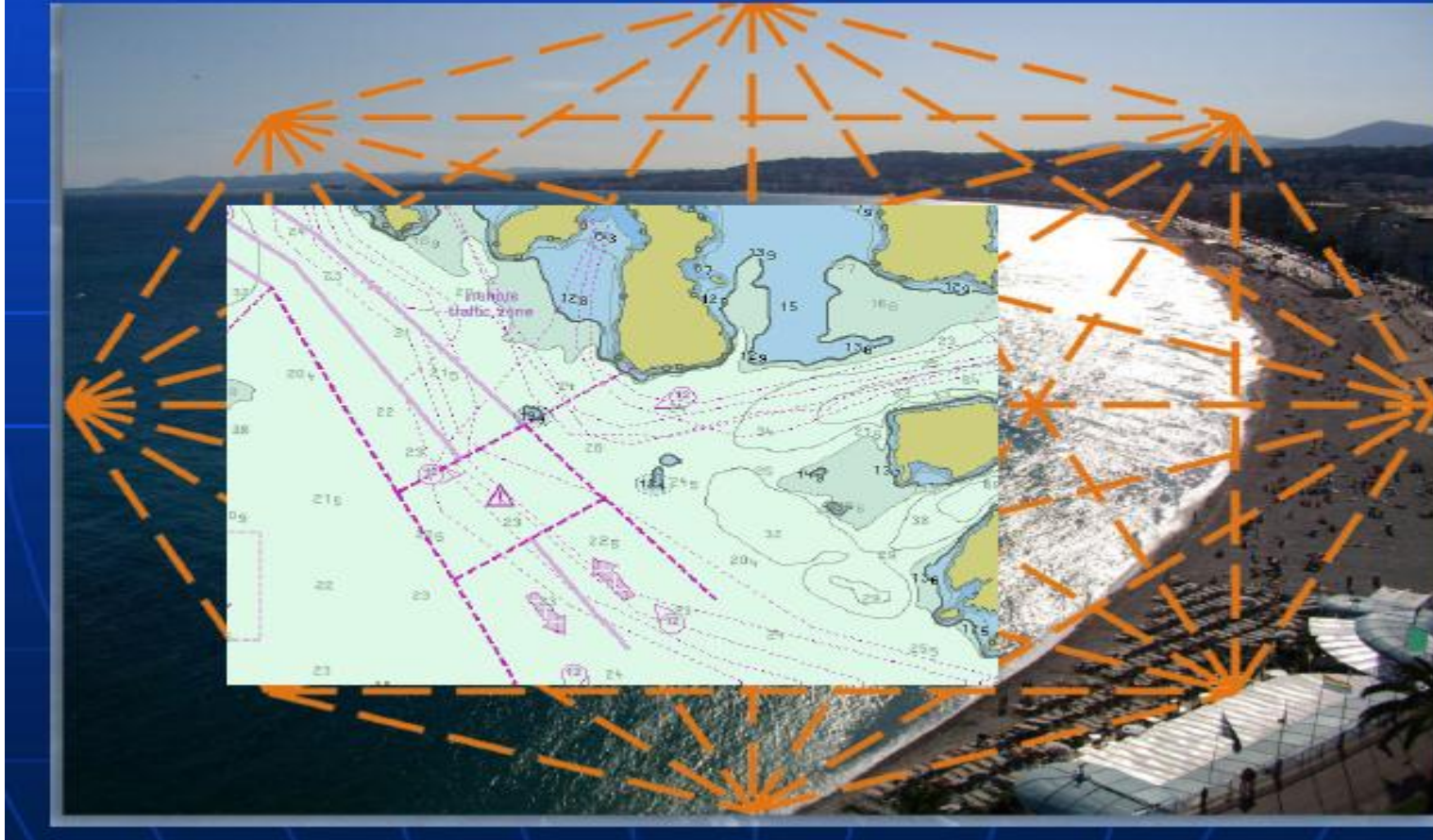
- **WG3 - Telecommunication**
 - All telecommunication aspects, including both terrestrial and space based radio communications, AIS, VDES, except radionavigation (PNT -).
 - Chair: Peggy Browning - Vicechair: Stefan Bober
- **WG4 - ENAV Services**
 - Define the content of e-Navigation services, operational (i.e. information - aspects of e-Navigation and the value added services provided to users.
 - Chair: Jon Leon Ervik - Vicechair: Thomas Porathe
- **WG5 – Positioning, Navigation & Timing**
 - All aspects of Positioning, Navigation and Timing systems
 - including resilience, reliability and integrity.
 - Chair: Alan Grant - Vicechair: Michael Hoppe

IALA Work to be undertaken next 4 years

- Common Shore based System Architecture
- e-Navigation infrastructure and governance
- Maritime Service Portfolios
- S-100 Product Specifications
- Communication channels – VDES ++
- Testbeds and implementation activities
- PNT solutions, e-Loran

IHOs position on e-Navigation

- e-Navigation information environment
= the maritime intranet



Source: Robert Ward at e-Navigation Underway 2015

IHO Standards, S-100 and e-Navigation

- common data structure (CMDS)
 - interoperability
- S-100
 - baseline (not exclusive - data exchange standard)
- IMO/IHO Harmonization Group on Data Modelling
 - Coordination, guidance, recommendations

IHO S-100 Product Specifications

- IHO S-101 ENC
- IHO S-102 Bathymetric Surface
- IHO S-103 Sub-surface Navigation
- IHO S-10x Tidal product for surface navigation
- IHO S-111 Surface currents
- IHO S-112 Real time tidal data transfer
- IHO S-121 Maritime limits and boundaries
- IHO S-122 Marine Protected Areas;
- IHO S-123 Radio Services
- IHO S-124 Navigational warnings
- IHO S-125 Navigational services
- IHO S-126 Physical Environment
- IHO S-127 Traffic Management
- IHO S-1xx Marine Services
- IHO S-1xx Digital Mariner Routing Guide
- IHO S-1xx Harbour Infrastructure
- IHO S-1xx (Social/Political)

Other Product Specifications within IHO GI Registry

- IALA: S-201 to S-299
 - IALA S-201 Aid to Navigation Information
 - IALA S-20x Inter-VTS Exchange Format
 - IALA S-20x Application Specific Messages
 - IALA S-20x (Maritime Safety Information)
- IOC: S-301 to S-399
- Various: S-401 to ...
 - IEHG S-401 Inland ENC
 - JCOMM S-411 Sea ice
 - JCOMM S-412 Met-ocean forecasts

Handling of MSI

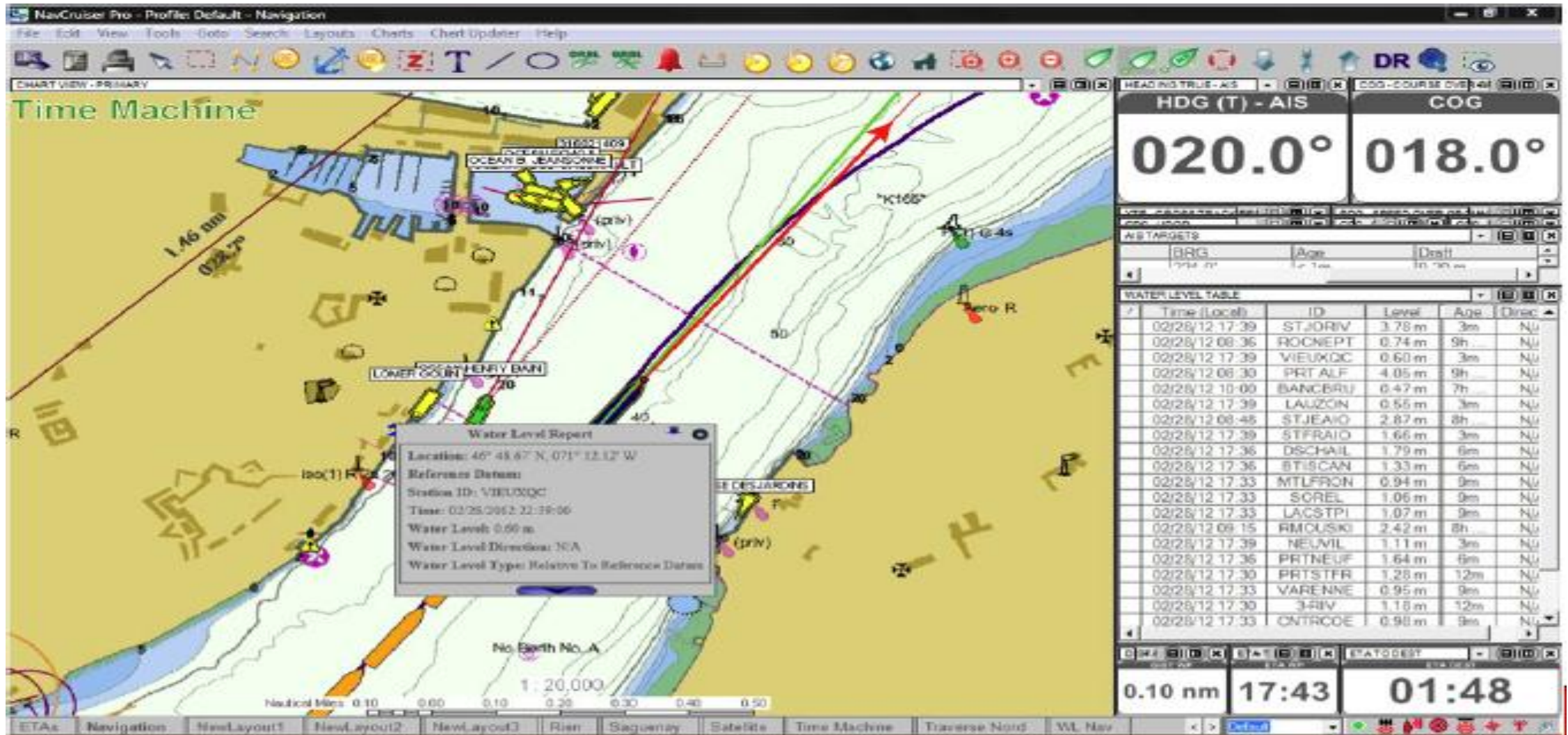
- IHO S-124 (Navigational Warnings) working group is preparing an MSI Product Specification
- IALA is developing Specifications on each MSP in their area of responsibility
 - **IALA is looking into MSP5, which relates to MSI and develop the Product Specification S-20x (Maritime Safety Information)**

During e-Navigation Underway 2015 the potential of overlapping Product Specifications have been discussed.

The discussion concluded in a proposal for IHO to develop an S-124 Product Specification and for IALA to build their product specification (S-20x) to reference and utilize S-124.

The topic is to be discussed further in the IALA e-Nav committee (e-Nav 16, April 2015)

IMPA view on e-Navigation Water Levels



IMPA view on e-Navigation

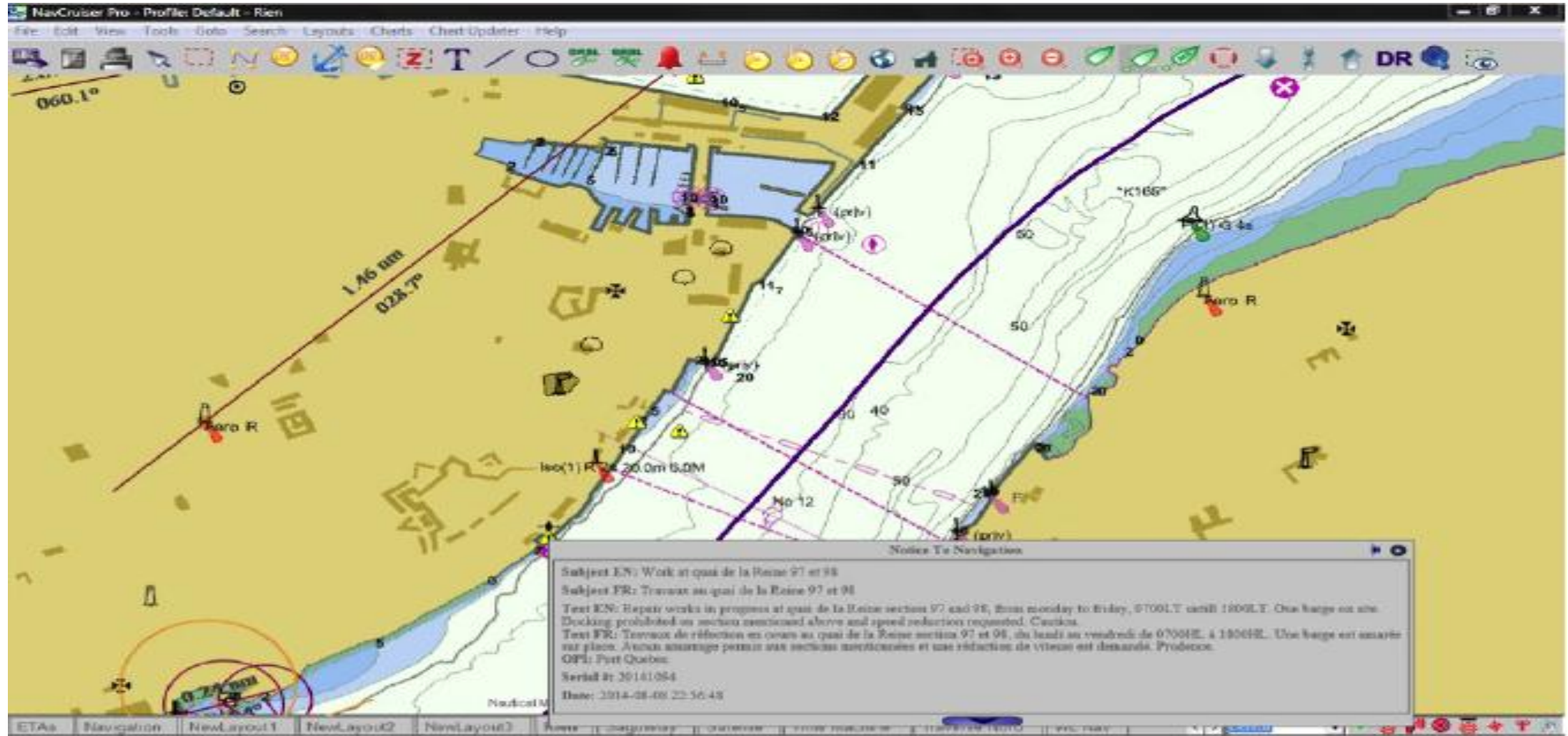
Shoal Soundings



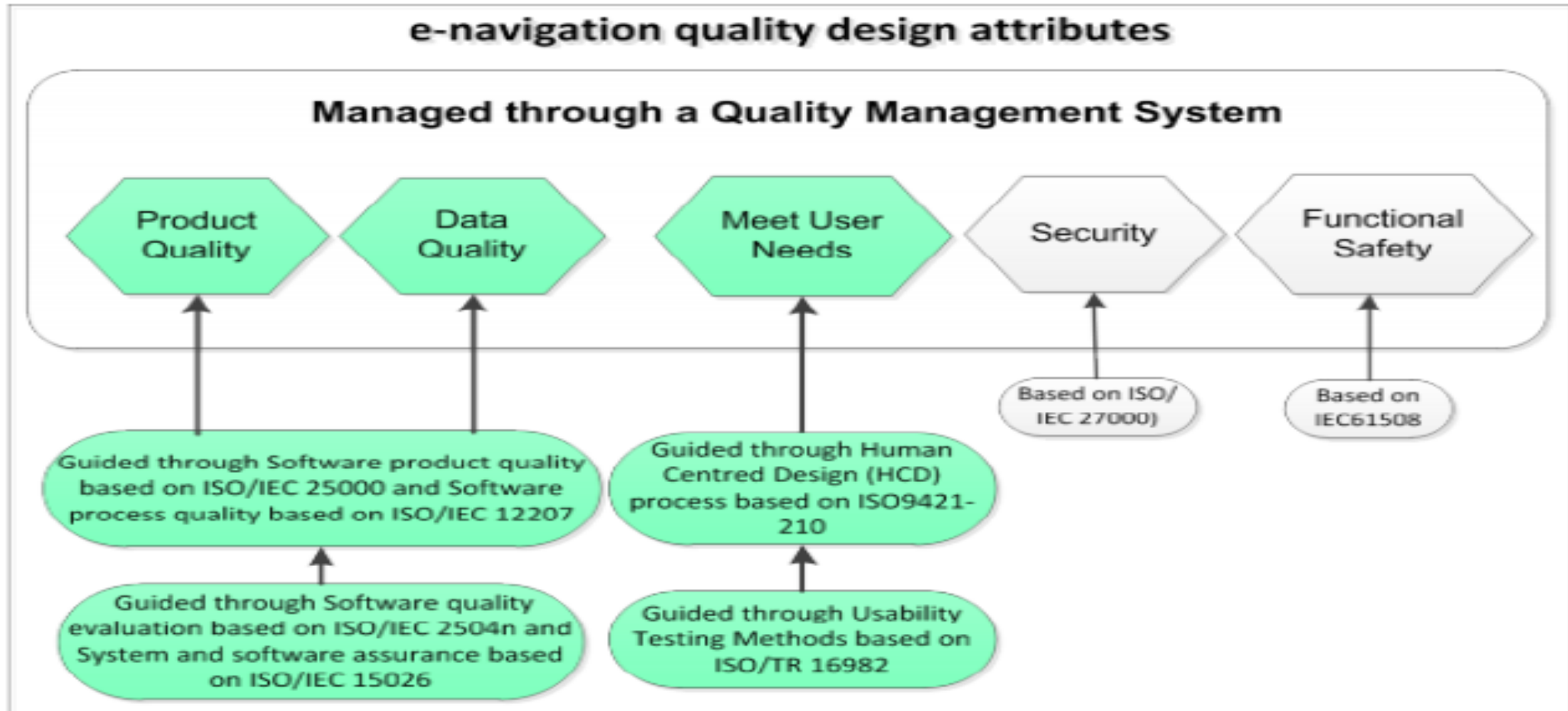
Source: Simon Pelletier at e-Navigation Underway 2015


IMPA view on e-Navigation

Notice to Mariner



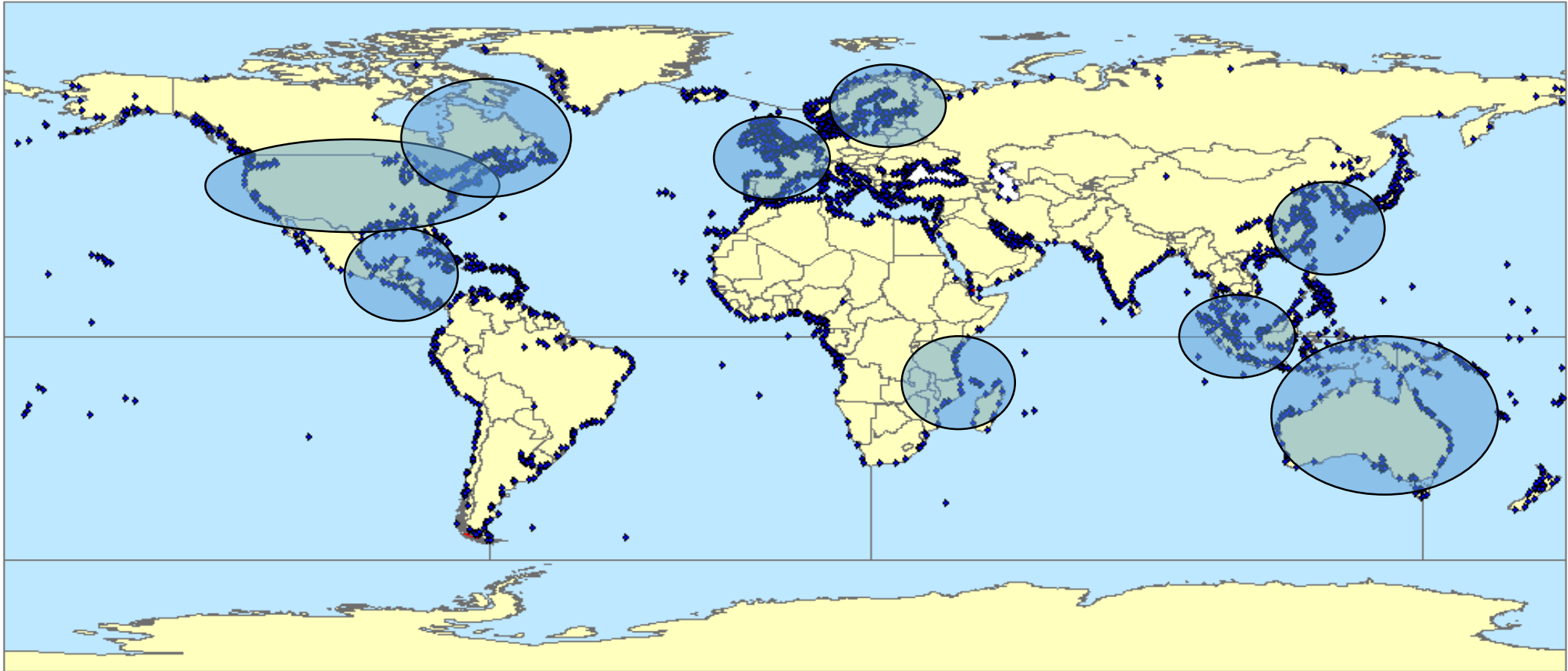
HCD and SQA Guidelines



 Covered by this guideline

Regional “Clusters” in e-Navigation

GIS visualization of collaboration



Ports around the world

E-Navigation Key Stakeholders



Ship



Pilots and
Bridge Teams



Owner/Operator



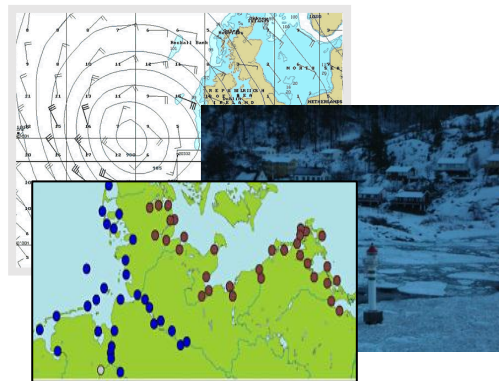
PSC



Data Service Provider



VTS – Coastal State



Tide Stations...



HOs



Customs...



Ports



Different focus areas

Navigation Safety

Owner/Operator

Strait & Port Utilization

Bridge Teams

Ship

Voyage Optimization

Coastal State

Coast State Responsibility

Tide Stations...

HOs

Customs...

Ports



Strategy to success



Ship



Pilots and
Bridge Teams



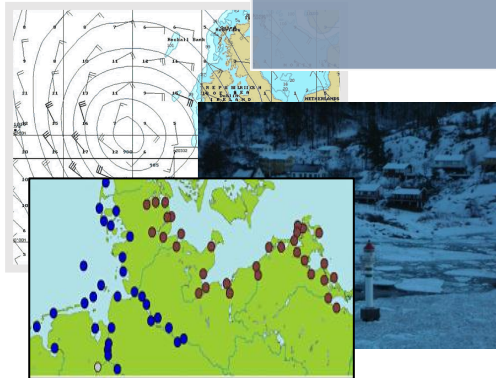
Owner/Operator



PSC



VTS – Coastal State



Tide Stations...

Data Service Provider



HOs



Customs...



Ports



Close collaboration
to optimize
maritime transport