

# iala-aism

*NIOHC 15*

## *Introduction to e-Navigation*



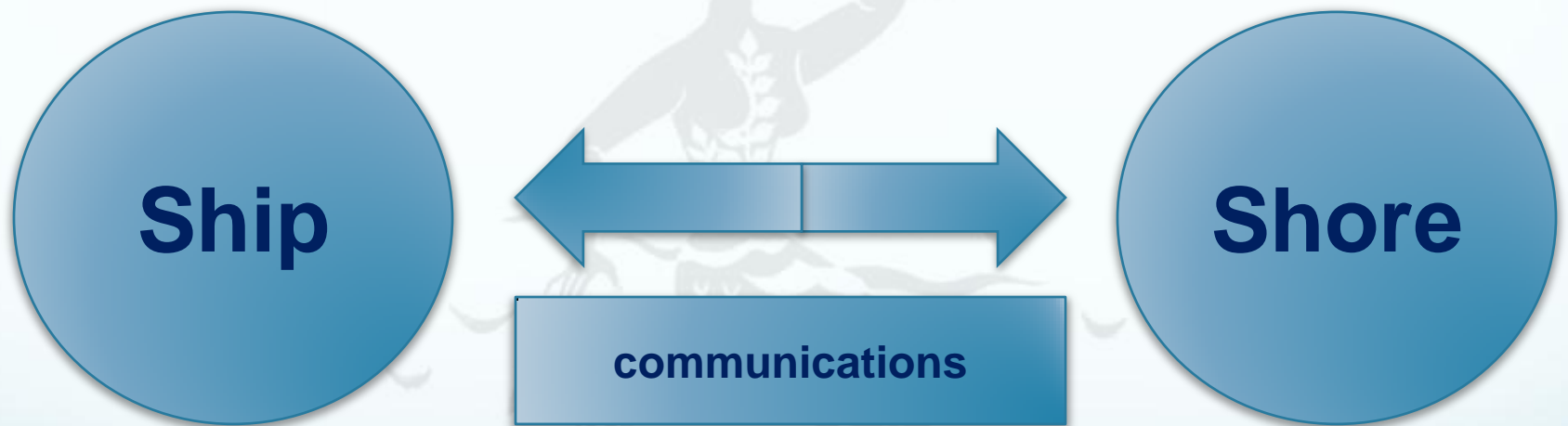
**Muscat**

***16 to 18 March 2015***

**In 2006:** In response to an initiative of the UK, co-sponsored by Japan, Marshall Island, the Netherlands, Norway, Singapore and the United States, the IMO Maritime Safety Committee decided “***to include in the work programme of the NAV and COMSAR Sub-Committees (...) a high priority item on ‘Development of an e-Navigation strategy’.***”

**Objective:** “***develop a broad strategic vision for incorporating the use of new technologies in a structured way and ensuring that their use is compliant with the various navigational communication technologies and services that are already available, with the aim of developing an overarching accurate, secure and cost-effective system with the potential to provide global coverage for ships of all sizes.***”

# Origin of e-Navigation



# Strategy and Framework

**In 2008:** MSC 85 approves the strategy for the development of e-Navigation and the framework for its implementation.

# Framework

**e-Navigation is a vision for the integration of existing and new navigational tools in a holistic and systematic manner.**

- **Radio communications, radars, radio navigation**
- **Global Maritime Distress and Safety System (GMDSS)**
- **Search and Rescue Transponders (SART)**
- **Automatic Radar Plotting Aids (ARPA)**
- **Identification Systems (AIS, LRIT)**
- **Electronic Chart Display and Information Systems (ECDIS)**
- **Integrated Bridge Systems/Integrated Navigation Systems (IBS/INS)**
- **Vessel Traffic Services (VTS)**

The **objective** is to enable the transmission, manipulation and display of navigational and related **information in electronic format.**

- Common datum
- Up-to-date electronic charts
- High integrity positioning systems
- Integrated displays and analysis capabilities (IBS/INS)
- Seamless data exchange (communication systems)
  - ✓ • on board,
  - ✓ • ship-to-ship
  - ✓ • ship-to-shore
  - ✓ • shore-to-shore

# e-Navigation Strategy at IMO

## Definition

## Develop detailed architecture for ship/shore

## User needs on board and ashore

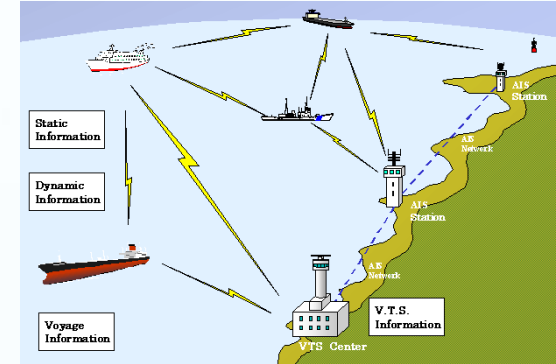
## Consider the development of Maritime Service Portfolios

## Gap analysis

## cost benefit and risk analysis processes

## Strategy Implementation Plan

## Test Beds





# IMO definition of e-navigation

*“e-Navigation is the harmonized collection, integration, exchange, presentation and analysis of marine information on board 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.”*



## In 2012: MSC 90 approved:

- gap analysis
- overarching e-navigation architecture
- development of a Common Maritime Data Structure (CMDs) based on the use of the IHO S-100 “Universal Hydrographic Data Model” (establishment of an IMO/IHO Harmonization Group on data modelling)
- continuation of the “Development of an e-navigation strategy implementation plan” with a target date extended to 2014 (NCSR 1)
- organisation of test-beds.

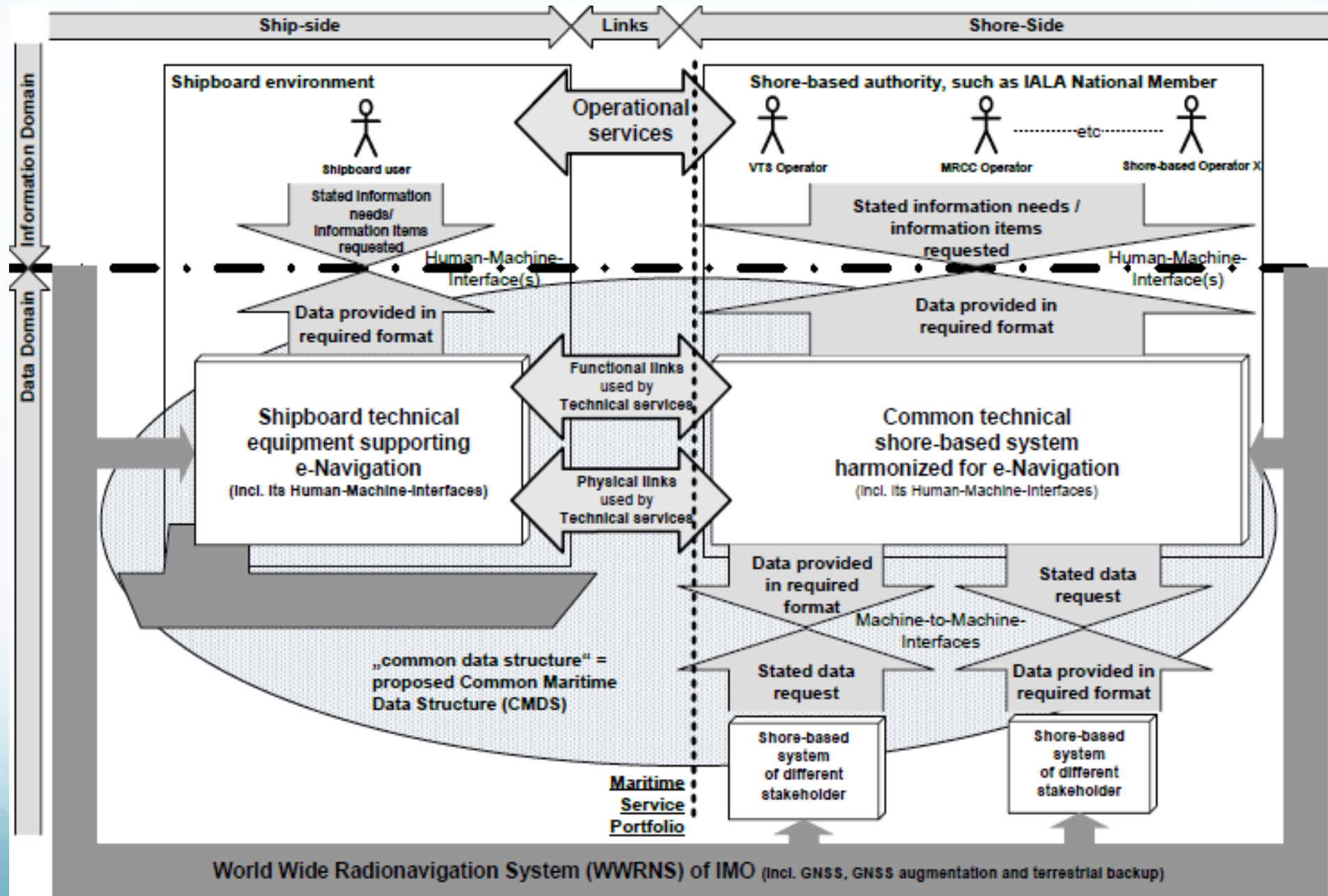
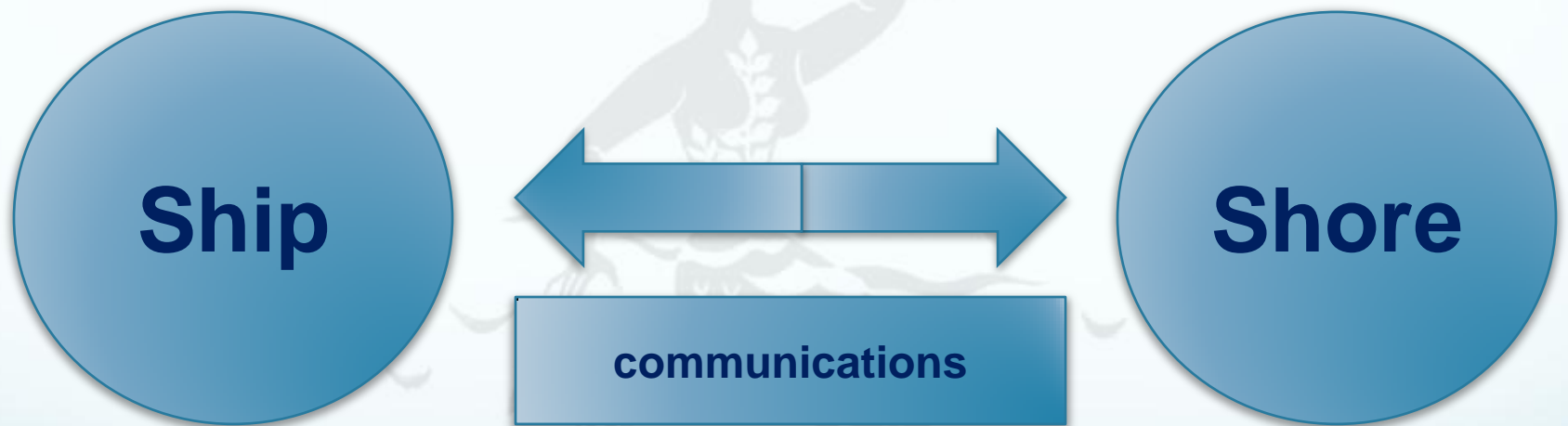


Figure 1 – Overarching e-navigation architecture

# Origin of e-Navigation



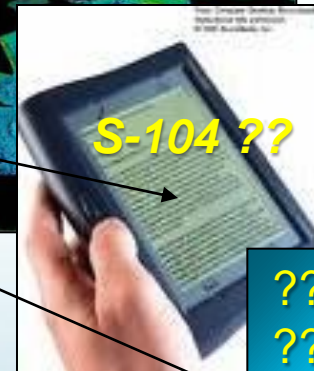
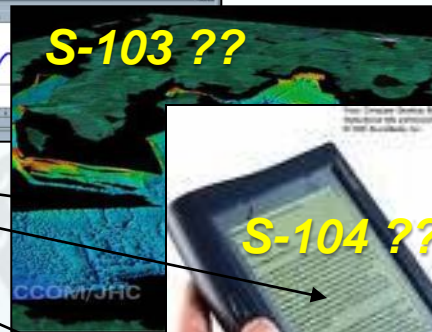
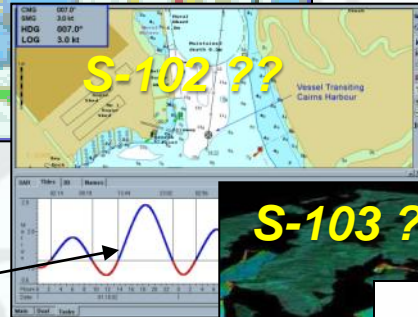
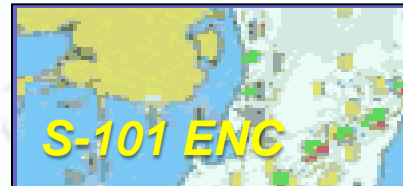
# Strategic Implementation Plan – First 5 Priorities – Nov 2014

- ★ **S1**: improved, harmonized and user-friendly bridge design;
- ★ **S2**: means for standardized and automated reporting;
- ★ **S3**: improved reliability, resilience and integrity of bridge equipment and navigation information;
- ★ **S4**: integration and presentation of available information in graphical displays received via communication equipment; and
- ★ **S9**: improved Communication of VTS Service Portfolio (not limited to VTS stations).

# S-100 and Product Specifications



... contains all the components to make different product specifications for all types of hydrographic data



?????????  
?????????  
?????????  
?????? ...  
S-10?...

# S-100 - overview

- ★ IHO Universal Hydrographic Data Model
- ★ Extends the principles of the original intent of S-57
- ★ S-100 describes the overarching model for data definition, transfer and combination
- ★ **Product Specification Register** - a list of S-100 based Product Specifications created by recognized organizations such as IALA (e.g. S-201 to S-299 for AtoN) describing the content, purpose, version, location and availability of those Product Specifications



# E-Navigation Testbeds

- ★ A number of testbeds have been established around the world (e.g. EfficienSea, ACCEAS, MonaLisa, the Marine Electronic Highway...)
- ★ Testbed results should be shared and reported according to IMO-MSC.1/Circ.1494 and IALA Guidelines 1107
- ★ Publication is encouraged on the IALA e-Navigation portal: [www.e-Navigation.net](http://www.e-Navigation.net)



# Summary

- ★ IMO will address ship side issues
- ★ IALA will address Resilient PNT and Comms issues
- ★ IHO will address ENCs to populate ECDIS
- ★ e-Navigation will use S-100 with Product Specifications
- ★ The Morse key to the mobile phone took just 25 years
- ★ e-Navigation test beds already being used
- ★ IHO and IALA leading the way