



International Hydrographic Organization

World-Wide Navigational Warning Service Sub-Committee

WWNWS-7

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Impact of e-navigation development
on the provision of hydrographic services

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Background

- 2006: IMO/MSC initiates the development of an e-navigation strategy (MSC 81/25 - paragraph 23.36)
- 2008: approval of the **Strategy for the development and implementation of e-navigation** and the Framework for the implementation of the strategy (MSC 85/26 - Annexes 20 & 21)
- 2014: approval of the **E-navigation Strategy Implementation Plan (SIP)** (MSC 94/21 - paragraph 9.15 and NCSR 1/28 - Annex 7)
- 2015: approval of outputs for the 2016-2017 biennium (MSC 95/22 - paragraph 19.12)



Definition and scope 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
- E-navigation is intended to meet present and future user needs through **harmonization of marine navigation systems and supporting shore services**



Core objectives of e-navigation related to hydrographic services (1/2)

- facilitate safe and secure navigation of vessels having regard to **hydrographic**, meteorological and navigational information and risks;
- facilitate **communications**, including data exchange, among ship to ship, ship to shore, shore to ship, shore to shore and other users;
- **integrate and present information** on board and ashore through a human-machine interface which maximizes navigational safety benefits and minimizes any risks of confusion or misinterpretation on the part of the user;

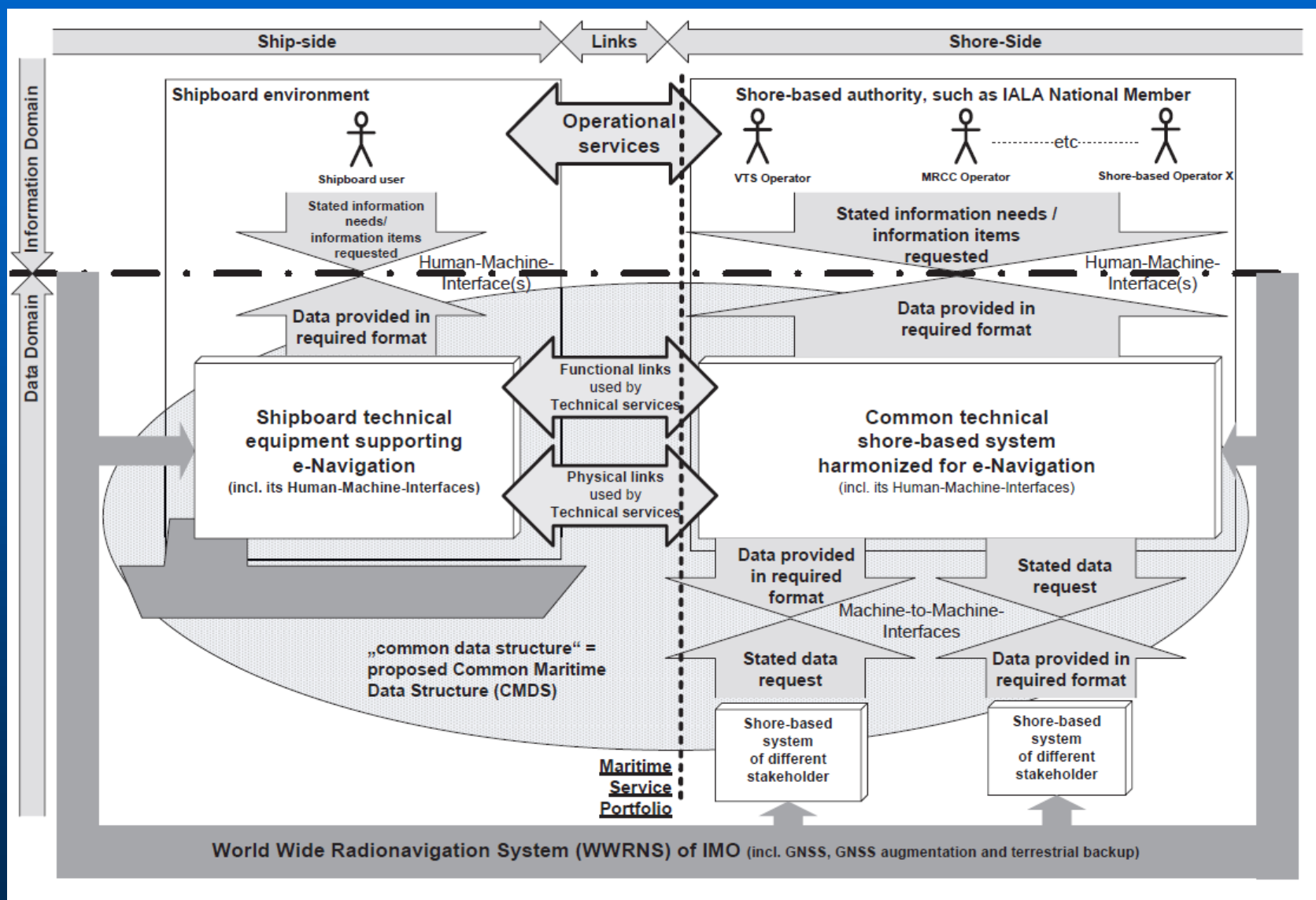


Core objectives of e-navigation related to hydrographic services (2/2)

- **integrate and present information** onboard and ashore to manage the workload of the users, while also motivating and engaging the user and supporting decision-making;
- **facilitate global coverage**, consistent standards and arrangements, and mutual compatibility and **interoperability** of equipment, systems, symbology and operational procedures, so as to avoid potential conflicts between users;
- support **scalability**, to facilitate use by all potential maritime users.



E-navigation Architecture



Implementation Plan

Prioritized Solutions

- S1: improved, harmonized and user-friendly bridge design;
- S2: ...
- S3: ...
- S4: ...
- S5: ...

Tasks 2015-2019

- T1: Development of draft Guidelines on Human Centred Design (HCD) for e-navigation systems
- T2: ...
- T3: ...
- T4: Formulate the concept of standardized modes of operation
- T5: ...
- ...
- T17: Further develop the MSPs

Output 1

Guidelines on standardized modes of operation (S-mode)

Next bienniums

Current biennium (2014-2015)

- Performance standards for multi-system shipborne radionavigation receivers
- Guidelines on Harmonization of testbed reporting
- Guideline on SQA and HCD for e-navigation



In short ...

- E-navigation could be the “ **maritime intranet** ”
- (digital) **hydrographic services**, (radio)**communications** and their **interaction** form key elements of e-navigation
 - need to **coordinate** the implementation of **e-navigation** and the **modernization of the GMDSS**
 - **need to coordinate the inputs from WWNWS-SC and HSSC**

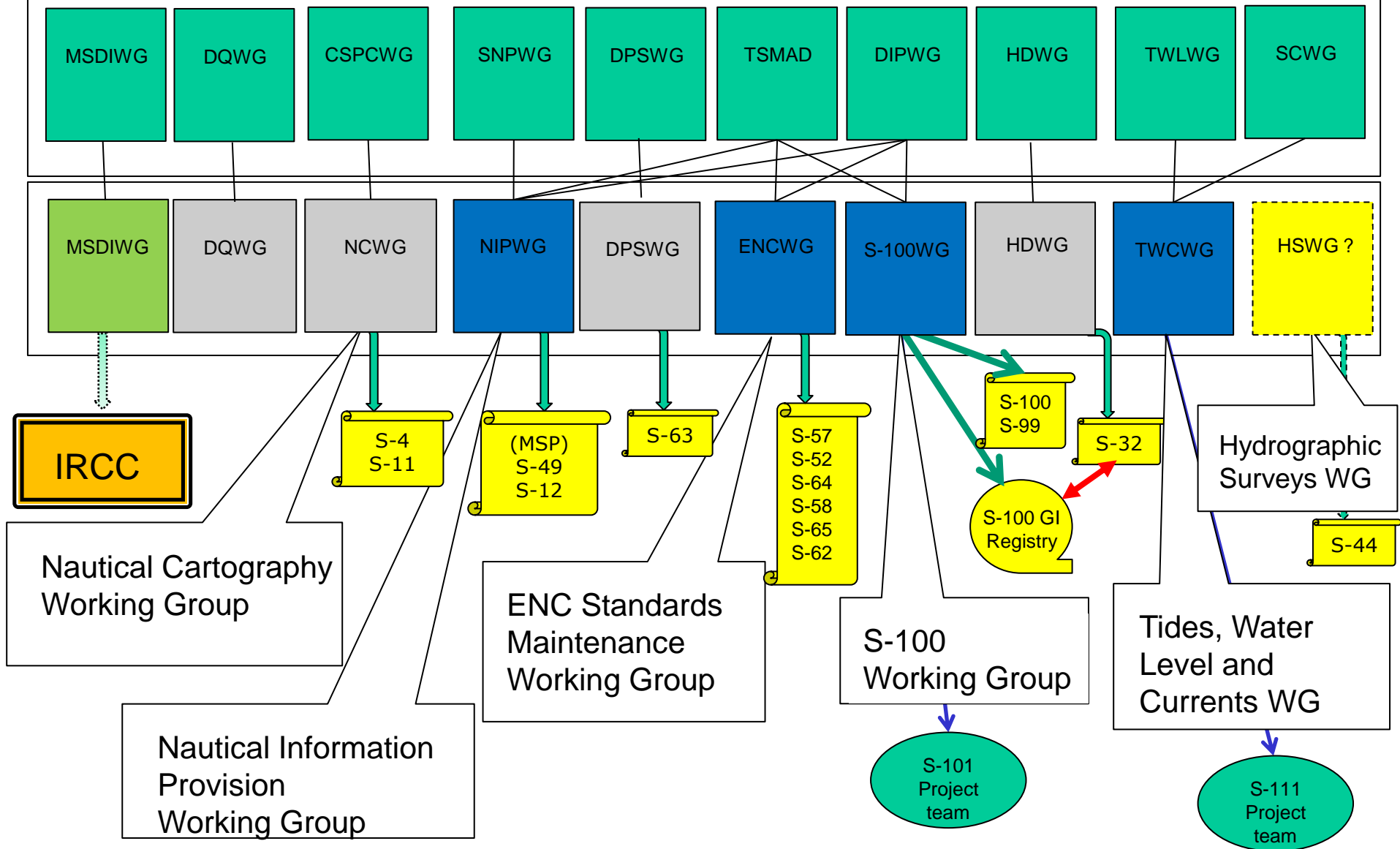


What the IHO has done ...

- Commitment to IMO to provide adequate coverage of ENC's (key strategy element)
- Development and promotion of S-100 (baseline for developing the Common Maritime Data Structure)
- Contribution to the successive IMO Correspondence Groups on e-navigation
- Development and implementation of a new structure of WGs under HSSC



New Structure of HSSC Working Groups



See Annex D of HSSC6-04.2A for the allocation of Product Specifications based on S-100

What the IHO is doing ...

- Continuation of the development of S-100
- Development of S-100 based product specifications
 - S-101 ENC
 - S-102 Bathymetric Surface
 - S-103 Sub-surface Navigation
 - S-10x Tidal product for surface nav.
 - S-111 Surface currents
 - S-112 Real time tidal data transfer
 - S-121 Maritime limits & boundaries
 - S-122 Marine Protected Areas
 - S-123 Radio Services
 - **S-124 Navigational warnings**
 - S-125 Navigational services
 - S-126 Physical Environment
 - S-127 Traffic Management
 - S-1xx Marine Services
 - S-1xx Digital Mariner Routeing Guide
 - S-1xx Harbour Infrastructure
 - S-1xx (Social/Political)



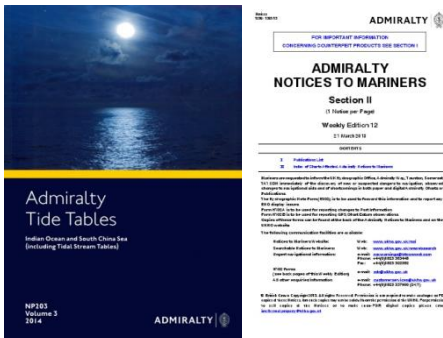
What the IHO needs to consider ...

- Develop a vision of its future Maritime Service Portfolio(s)
 - Yesterday: paper products (push mode)
 - Nautical Charts
 - Nautical Publications
 - Notices to Mariners
 - Navigational Warnings
 - Today: combination of paper and digital products (push/pull mode)
 - ENCs (EN and ER profiles)
 - E-books
 - Notices to Mariners
 - Navigational Warnings
 - To-morrow: integrated maritime information systems (pull mode)?
 - Maritime cloud?
 - Enter once / use many times (layered information)
 - Continuous update



SOLAS Regulation V/27: Nautical charts and nautical publications, such as sailing directions, lists of lights, notices to mariners, tide tables and all other nautical publications necessary for the intended voyage, shall be adequate and up to date.

Maritime Cloud



Yesterday

Today

To-morrow

IMO/IHO Harmonization
Group on Data Modelling
(HGDM)

Standards
S-100
S-xxx

Regulations

Competent
Authorities

Bathymetry

Topography

Port infra.

AtoNs

MPAs

VTS

Meteo

Etc.

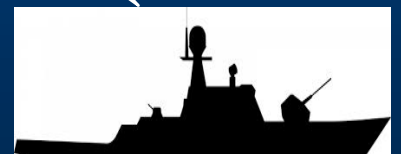
Layer = Owner / Update mechanism
/ Selectability / Scalability

ENC

Composite product =
Owner / Update mechanism

Maritime Cloud

CG



Users



Maritime Service Portfolios (MSPs)

E-navigation Strategic Implementation Plan

- A "Maritime Service Portfolio (MSP)" defines and describes the set of operational and technical services and their level of service provided by stakeholders in a given sea area, waterway, or port, as appropriate. An MSP may also be construed as a set of "products" provided by a stakeholder (NAV 59/6, paragraph 35)
- As part of the improved provision of services to vessels through e-navigation, MSPs have been identified as the means of providing electronic information in a harmonized way (...)
- The further development of the MSPs is task T17
 - Expected deliverable: Resolution on Maritime Service Portfolios
 - Prioritized implementation schedule: 2019



Maritime Service Portfolios (MSPs)

Proposed list

No	Identified Services	Identified Service Provider
MSP1	VTs Information Service (IS)	VTs Authority
MSP2	Navigational Assistance Service (NAS)	National Competent VTs Authority/Coastal or Port Authority
MSP3	Traffic Organisation Service (TOS)	National Competent VTs Authority/Coastal or Port Authority
MSP4	Local Port Service (LPS)	Local Port/Harbour Operator
MSP5	Maritime Safety Information Service (MSI)	National Competent Authority
MSP6	Pilotage Service	Pilot Authority/Organization
MSP7	Tugs Service	Port/Commercial Tug Organization
MSP8	Vessel Shore Reporting	National Competent Authority, Shipowner/Operator/Master
MSP9	Tele Medical Assistance Service (TMAS)	National/Dedicated Health Organization
MSP10	Maritime Assistance Service (MAS)	Coastal or Port Authority/Organization
MSP11	Nautical Chart Service	National Hydrographic Authority/Organization
MSP12	Nautical Publications Service	National Hydrographic Authority/Organization
MSP13	Ice Navigation Service	National Competent Authority/Organization
MSP14	Meteorological Information Service	National Meteorological Authority /WMO/Public Institutions
MSP15	Real Time Hydrographic and environmental information service	National Hydrographic and Meteorological Authorities
MSP16	Search and Rescue Service (SAR)	National Competent Authority/Organization



Maritime Service Portfolios (MSPs)

IHO views to IMO

- MSPs 5/11/12/13/15 reflect the traditional methods of promulgating nautical information based on paper products (nautical charts and publications)
- These arrangements do not acknowledge the flexibility offered by digital products and electronic display and information systems in the context of e-navigation



Maritime Service Portfolios (MSPs)

IHO views to IMO

- The IHO recommends that the MSPs be reorganized in order to ensure that the mariner is supported by integrated real-time situational awareness:
 - merge proposed MSP11 and 12 and the hydrographic component of MSP15 into a single MSP called "Hydrographic Services" in accordance with the definition of SOLAS regulation V/9
 - delete MSP5 (MSI Service) and assign the functionalities of MSP5 as the "update" component of the basic services concerned
 - Example: include the provision of navigational warnings and chart correction data in MSP "Hydrographic services"



Maritime Service Portfolios (MSPs)

Proposed way forward

- NIPWG is tasked to develop high level specifications for a combined MSP addressing the provision of hydrographic services to mariners
- WWNWS-SC is invited to liaise with NIPWG to ensure coordinated contributions to the GMDSS modernization project and to the implementation of e-navigation
- Next step: preparation of submission(s) on further outputs to MSC 96 (deadline: 5 Feb 2016 for proposals / 9 Mar 2016 for comments)





Questions / Comments?

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