



PIANC *"Navigation, Ports, Waterways"*
Inland Waterways Commission

PIANC-SMART Rivers 2017

e-Navigation for Inland Waterways

WG156

Pittsburgh – 20/09/2017

Ir. Dierik Vermeir

Overview

- Origin and Need for WG156
- Objectives of WG156
- Work programme and Approach WG156
- Final Product WG156
- Findings/Results
- Conclusions and recommendations

Origin and Need of WG156

- WG156 is originated from WG125 – Guidelines and recommendations for River Information Services (RIS) - 2011.
- WG125 (2011 and before) was really focused on inland waterways. But during the working process it became clear that it could be very useful to look also at the realisations and implementations in the maritime world.
- ToR for WG156 presented to and accepted by PIANC

Why the need?

- The number of *mixed mode traffic* areas as well as the *traffic density* itself is constantly increasing. This situation with *inland barges and seagoing vessels operating next to each other* call *for a harmonization of the services and information used for traffic management*.
- The *growing need for intermodal transport* and especially *inland navigation* could benefit from a *more harmonized information exchange* between maritime and inland waterborne transport (see also article 1 of the RIS Directive 2005/44/EC).

Example the Western Scheldt River (VL-NL)

Some figures:

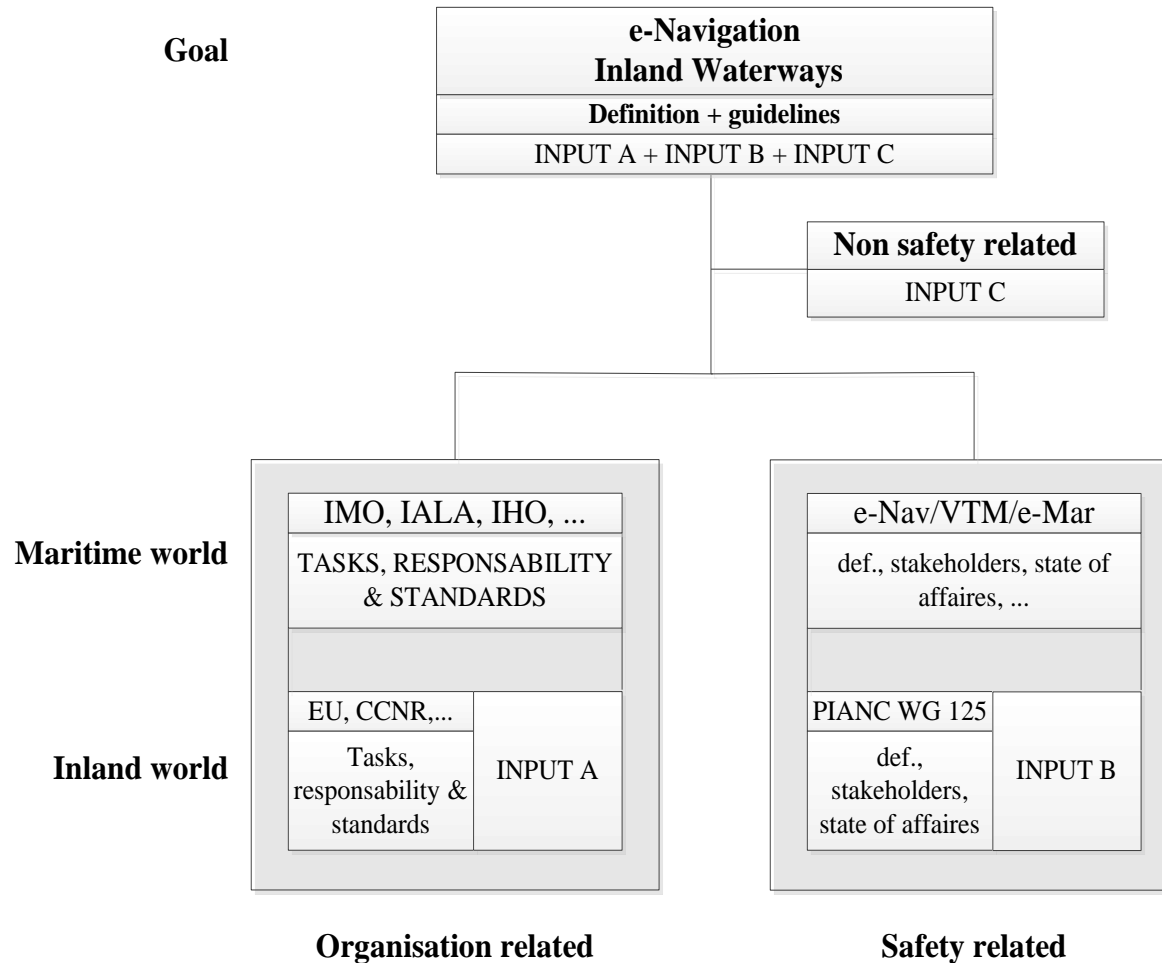
- 165.000 voyages/year
- 60% seagoing ships (↓)
- 40% inland barges (↑)
- 25 million AIS positions/24h



Main Objectives of WG156

- Provide a definition of e-Navigation for Inland Waterways
- Whether inland navigation could benefit from the developments in the maritime environment.
- In what way the required interaction between maritime transport and inland navigation in this context can be guaranteed to safeguard the required interoperability of future maritime and inland navigation systems.
- What the implications for River Information Services and the PIANC guidelines on RIS are → WG125

Work Programme and Approach WG156



Final Product

Report WG156:

- Introduction
- Status and Framework for River Information Services
- Status and Framework for e-Maritime and e-Navigation
- Findings/Results of e-Navigation for Inland Waterways
- Conclusions
 - General Conclusions
 - Lessons learned
- Recommendations (23)



Findings/Results

Definition e-Navigation for Inland Waterways

- e-Navigation for inland waterways is the framework of information service components based on existing River Information Services (RIS) and RIS Key Technologies
- in order to enable harmonized collection, integration, exchange, presentation and analysis of navigation and logistics related information on board and ashore
- by electronic means
- to enhance safe, efficient, reliable, and environmentally responsible navigation
- on inland waterways and intermodal connections, especially maritime navigation.

Whether RIS could benefit from the developments in e-Navigation in the Maritime World - I:

➤ Inland Waterways:

- RIS Services and RIS Key Technologies

➤ Maritime world:

- We have the Strategic Implementation Plan (SIP) for e-Navigation for the Maritime World:

- The 7 pillars concept for e- Navigation
- Maritime Service Portfolios (MSP - 16 services) is the framework of information in order to enable harmonized collection, integration, exchange, presentation and analysis of navigation and logistics related information on board and ashore

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River Information Services (RIS)

RIVER INFORMATION SERVICES

Mainly traffic related

1 Fairway information Services (FIS)

2 Traffic information (TI)

- a) Tactical traffic information (TTI)
- b) Strategic traffic information (STI)

3 Traffic management (TM)

- a) Local traffic management (vessel traffic services - VTS)
- b) Lock and bridge management (LBM)
- c) Traffic Planning (TP)

4 Calamity abatement support (CAS)

Mainly transport related

5 Information for transport logistics (ITL)

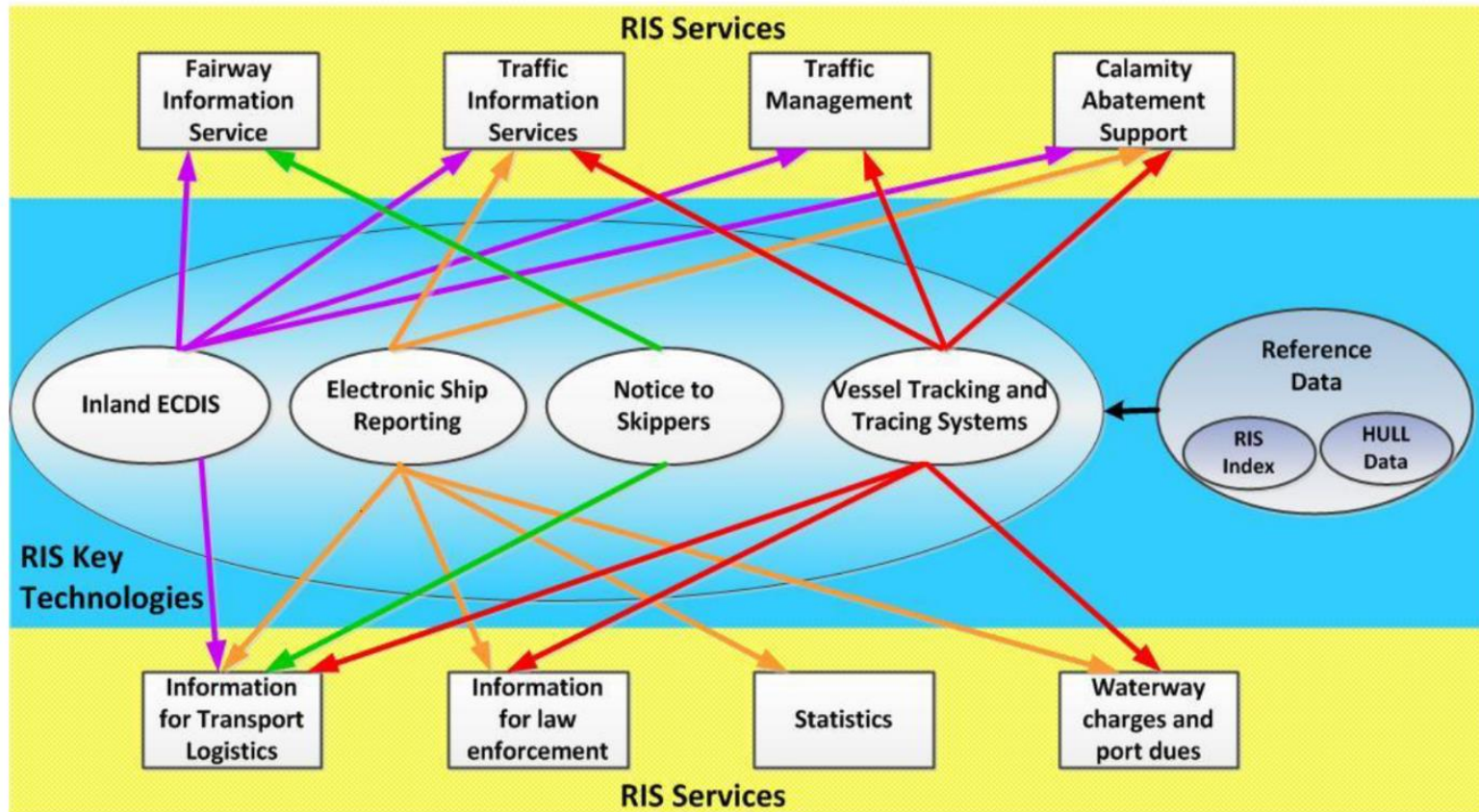
- a) Voyage planning (VP)
- b) Transport management (TPM)
- c) Inter-modal port and terminal management (PTM)
- d) Cargo and fleet management (CFM)

6 Information for law enforcement (ILE)

7 Statistics (ST)

8 Waterway charges and harbour dues (CHD)

River Key Technologies & Ref. Data



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➤ RIS Services and RIS Key Technologies

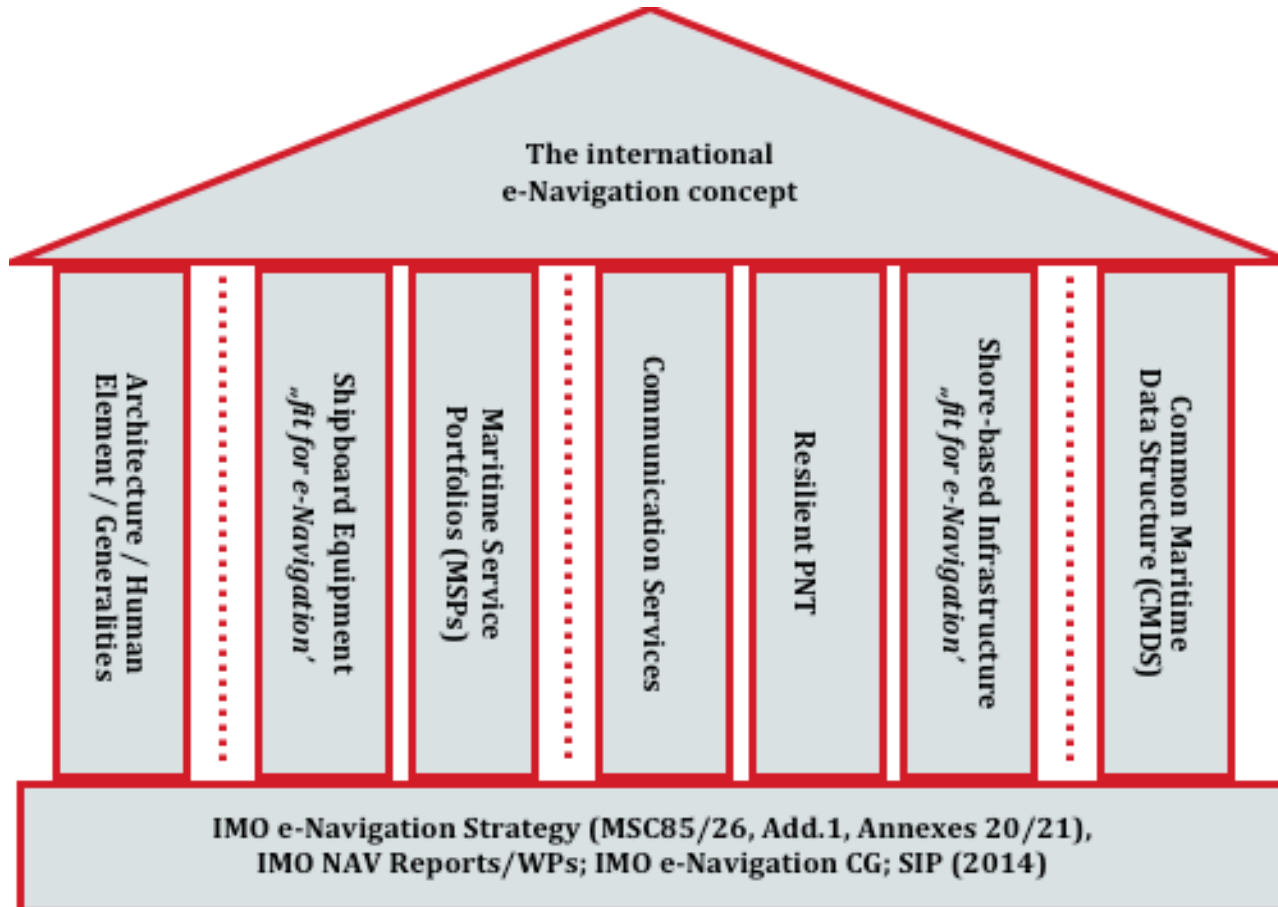
➤ Maritime world:

➤ We have the Strategic Implementation Plan (SIP) for e-Navigation for the Maritime World:

➤ The 7 pillars concept for e- Navigation

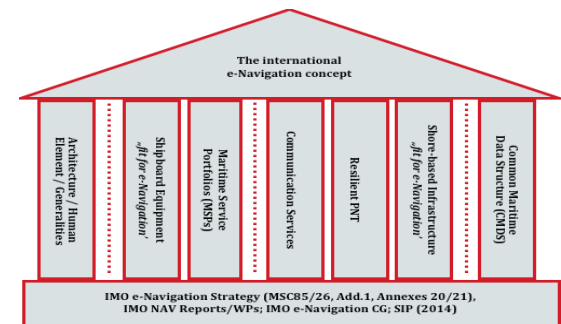
➤ Maritime Service Portfolios (MSP - 16 services) is the framework of information in order to enable harmonized collection, integration, exchange, presentation and analysis of navigation and logistics related information on board and ashore

The 7 pillars concept of e-Navigation

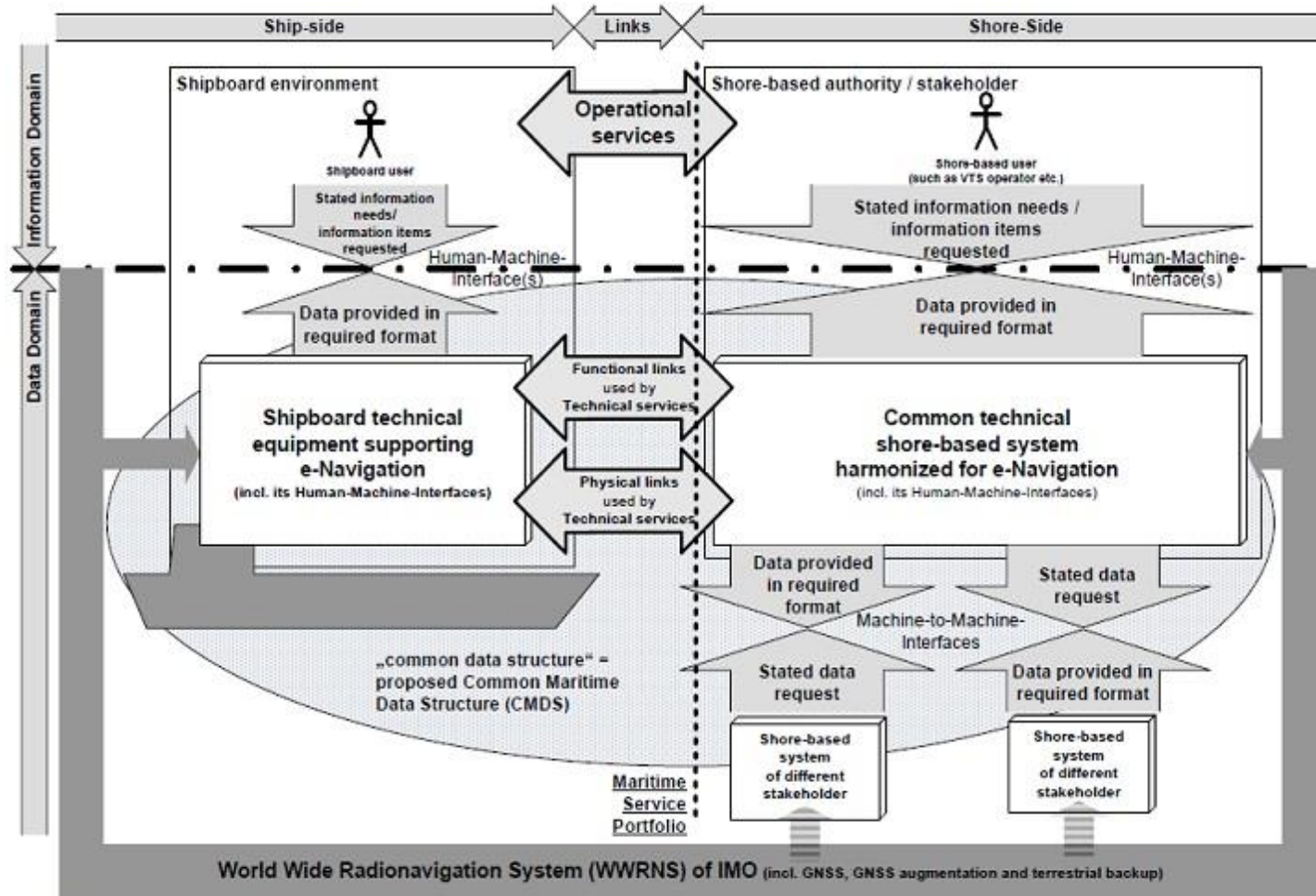


The 7 pillars concept of e-Navigation

- Architecture/Human Element/Generalities
- Shipboard Equipment “fit for e-Navigation”
- Maritime Service Portfolio’s (MSP’s)
- Communication Services
- Resilient PNT
- Shore-based Infrastructure “fit for e-Navigation”
- Common Maritime Data Structure (CMDS)

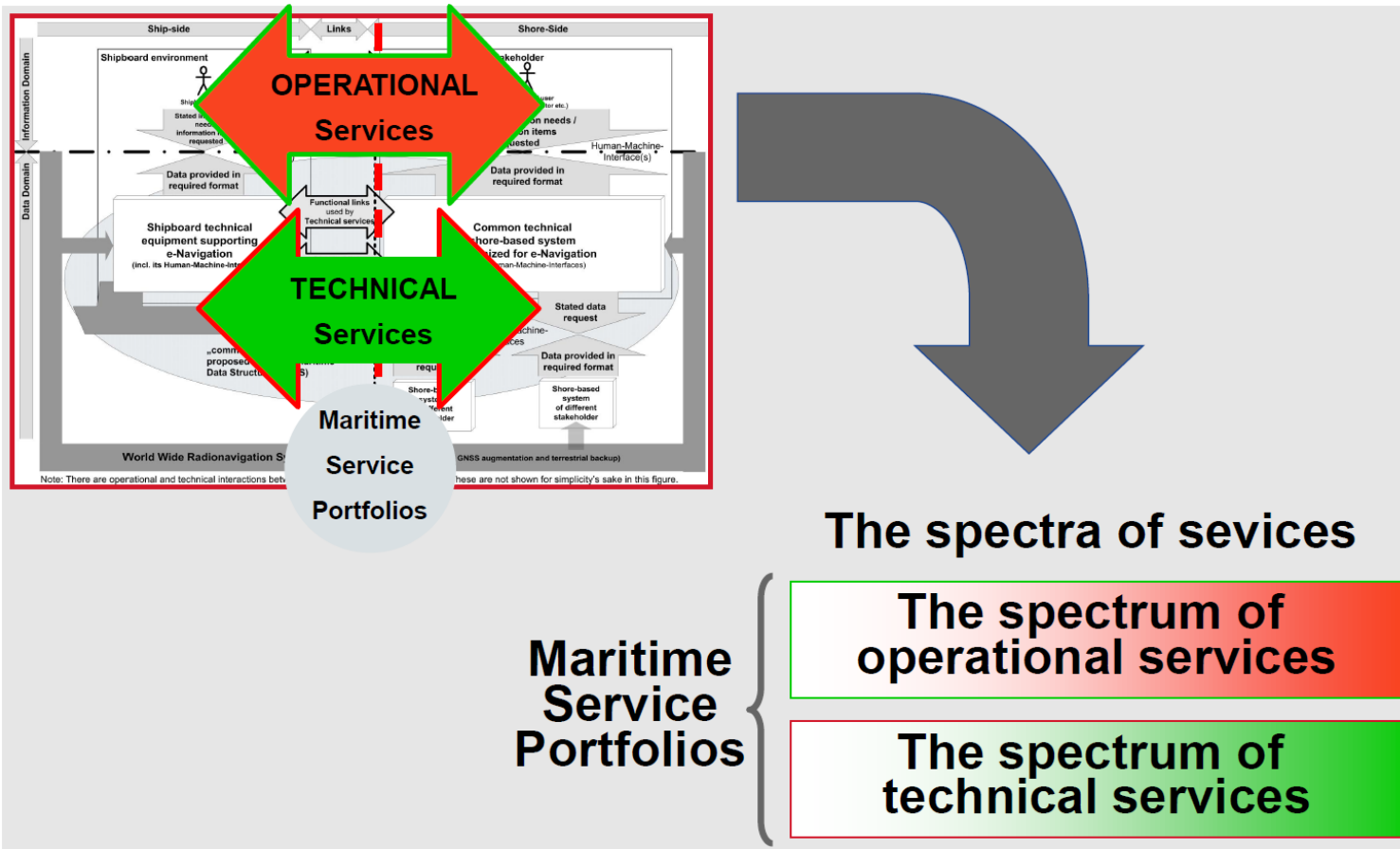


e-Navigation Architecture

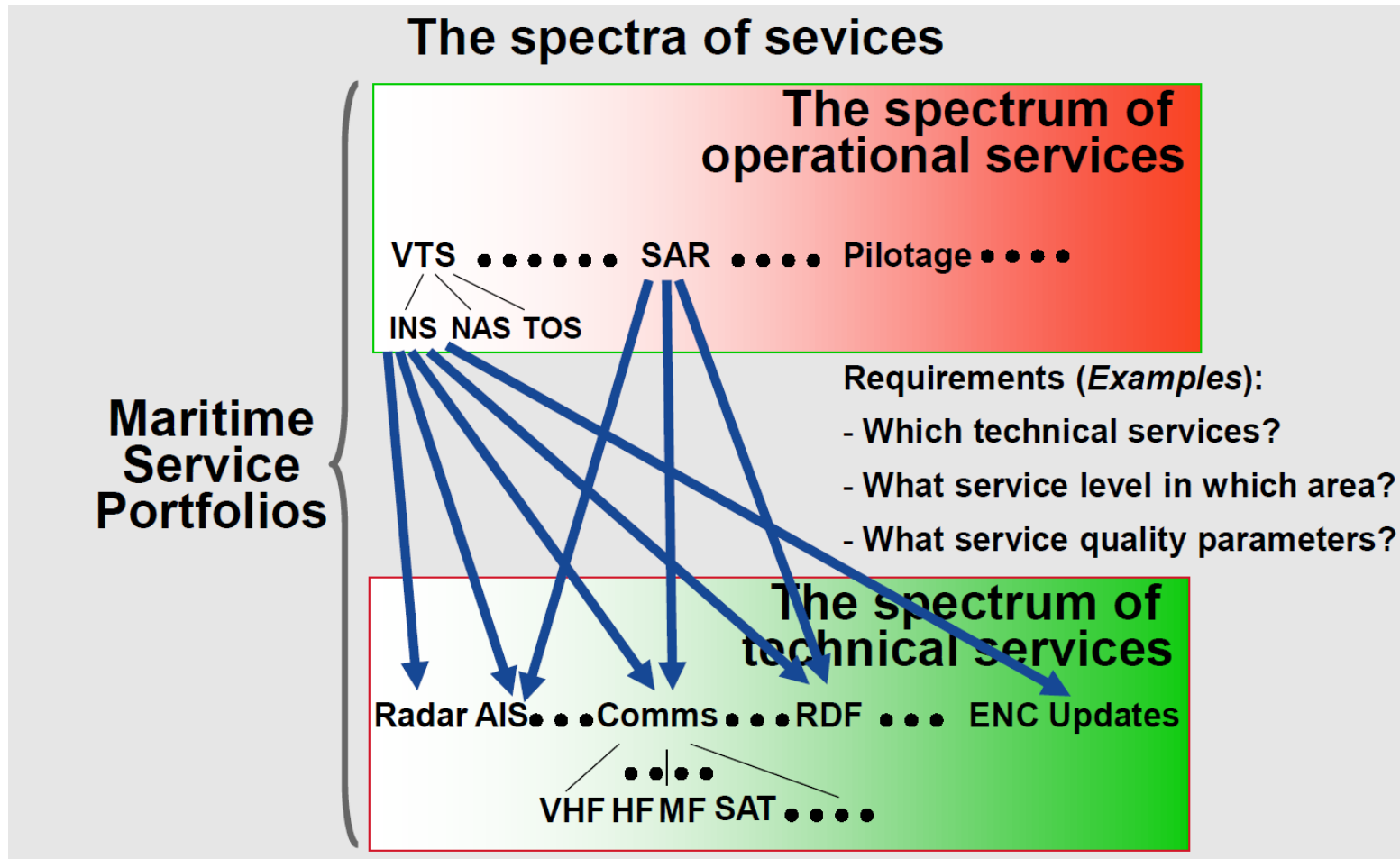


Note: There are operational and technical interactions between different shipboard environments. These are not shown for simplicity's sake in this figure.

Maritime Service Portfolios - I



Maritime Service Portfolios - II



Conclusion/Recommendation

e-Navigation	
Inland Waterways (RIS)	Maritime Transport Mode
RIS Services	Operational Services
RIS Key Technologies	Technical Services

Recommendation:

In order to facilitate alignment between RIS and maritime e-Navigation, it is recommended to use the same terminology wherever possible or to identify commonalities if different terms are used.

Whether RIS could benefit from the developments in e-Navigation in the Maritime World - I:

- **Comparison between:**
 - **RIS Services and the 7 Pillars concept**
 - **MSP vs. RIS services and vice versa**

e-Navigation pillars and RIS services relation

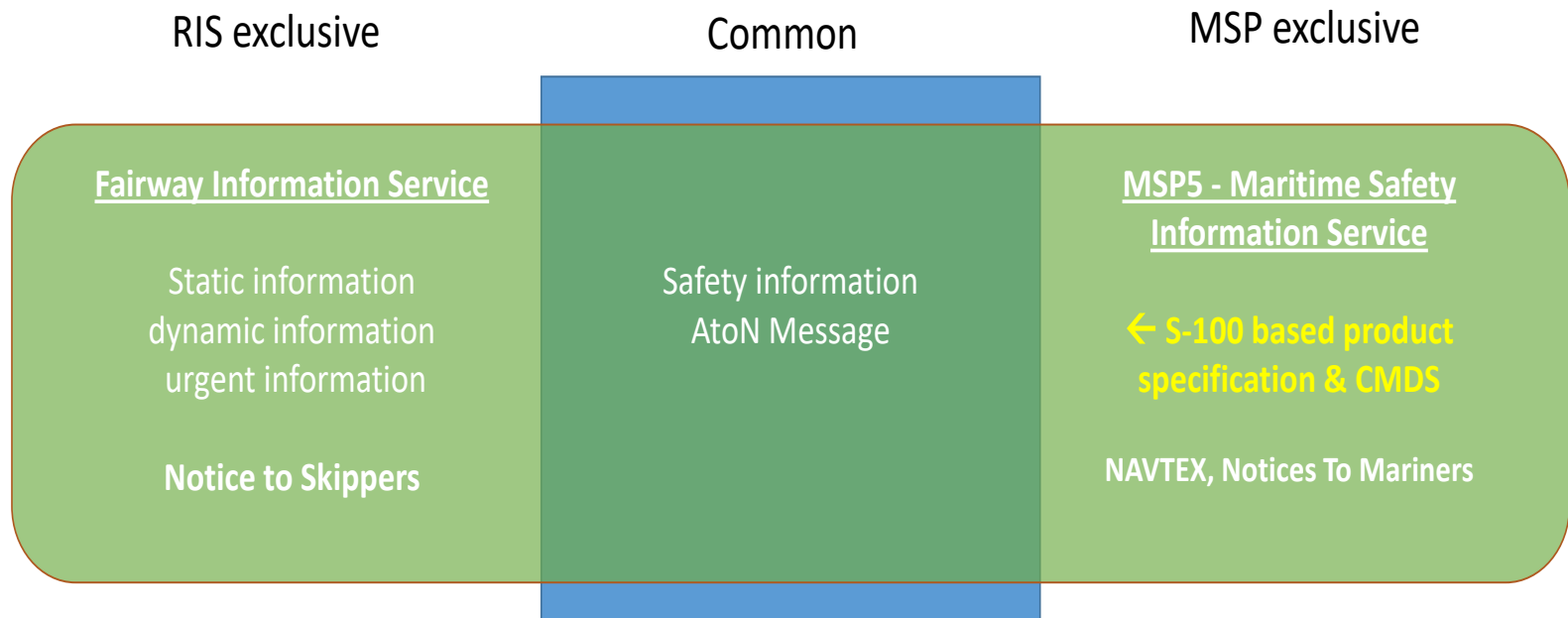
e-Navigation pillar	Relation with RIS
e-Navigation pillar	Relation with RIS
<p>1. Overarching architecture:</p> <p>To provide the overarching structural framework for operational functions and technical systems, to allow parallel but coherent and harmonized development and implementation of the IMO e-Navigation strategy.</p> <p>Human Element:</p> <p>The human element should not be forgotten as over-reliance on technologies can be dangerous in hazardous situations at sea, and training of staff is very important. The administrative burden should be as low as possible for navigating personnel.</p>	<p>An overarching architecture for RIS does not exist. For the moment there is the RIS directive, the RIS guidelines and four technical directives (NtS, AIS, ERI and Inland ECDIS).</p> <p>There is also a need in RIS to take the human element into account because there is an increased introduction of technologies onboard and administrative burdens that are similar to the maritime environment.</p>
	<p>parameters for all relevant operational and technical services in the maritime domain and operational services.</p>

Maritime Service Portfolios (MSPs) are one of the seven pillars of e-Navigation and consist of the following services:

- (MSP 1) VTS Information Service (INS);
- (MSP 2) VTS Navigation Assistance Service (NAS);
- (MSP 3) VTS Traffic Organization Service (TOS);
-
-
-
-
-
- (MSP 16) Real-time hydrographic and environmental information services
- (MSP 17) Search and Rescue (SAR) Service.

Example Comparison MSP/RIS Services

MSP5 – Maritime Safety Information Service



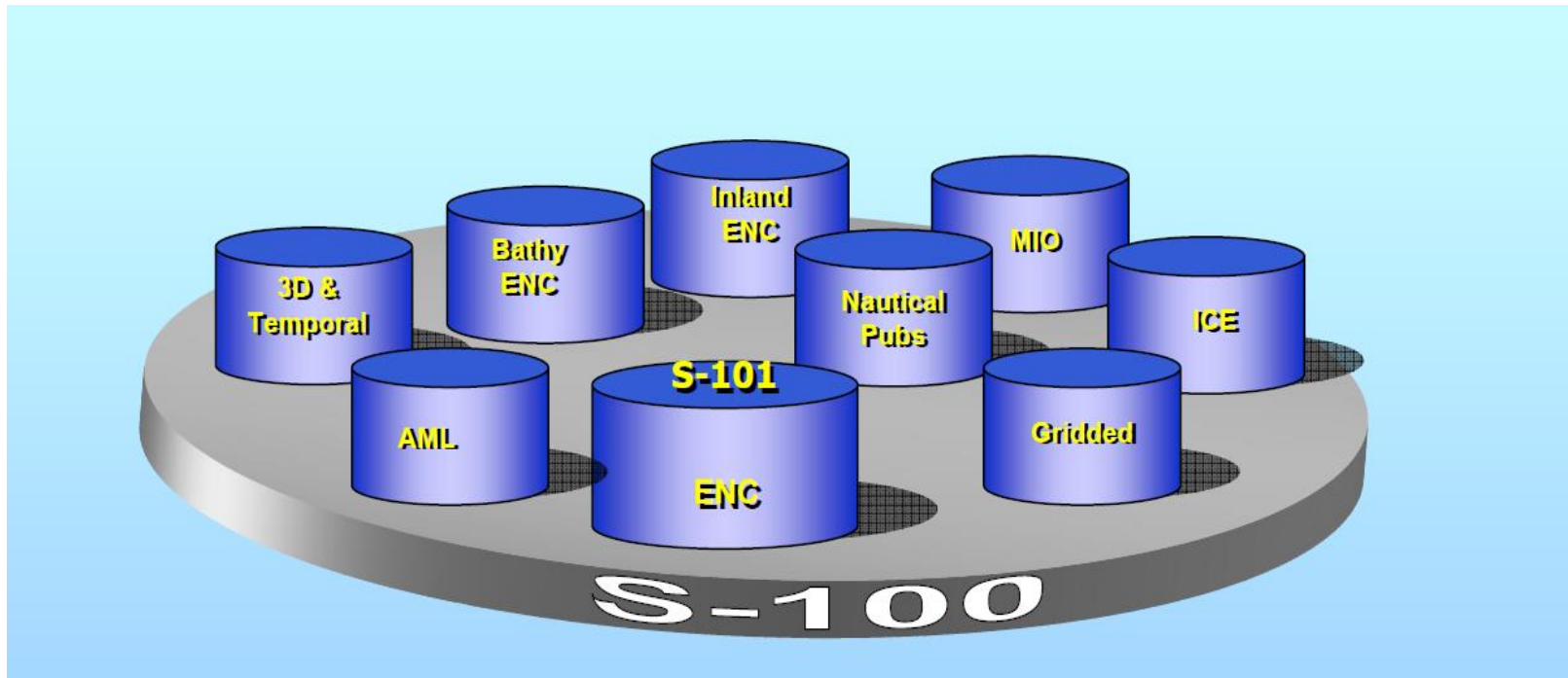
Whether RIS could benefit from the developments in e-Navigation in the Maritime World - II:

Relevant e-Navigation Technologies used in the Maritime World usefull for Inland Navigation:

- S-100
- CMDS
- Maritime Cloud
- SOA

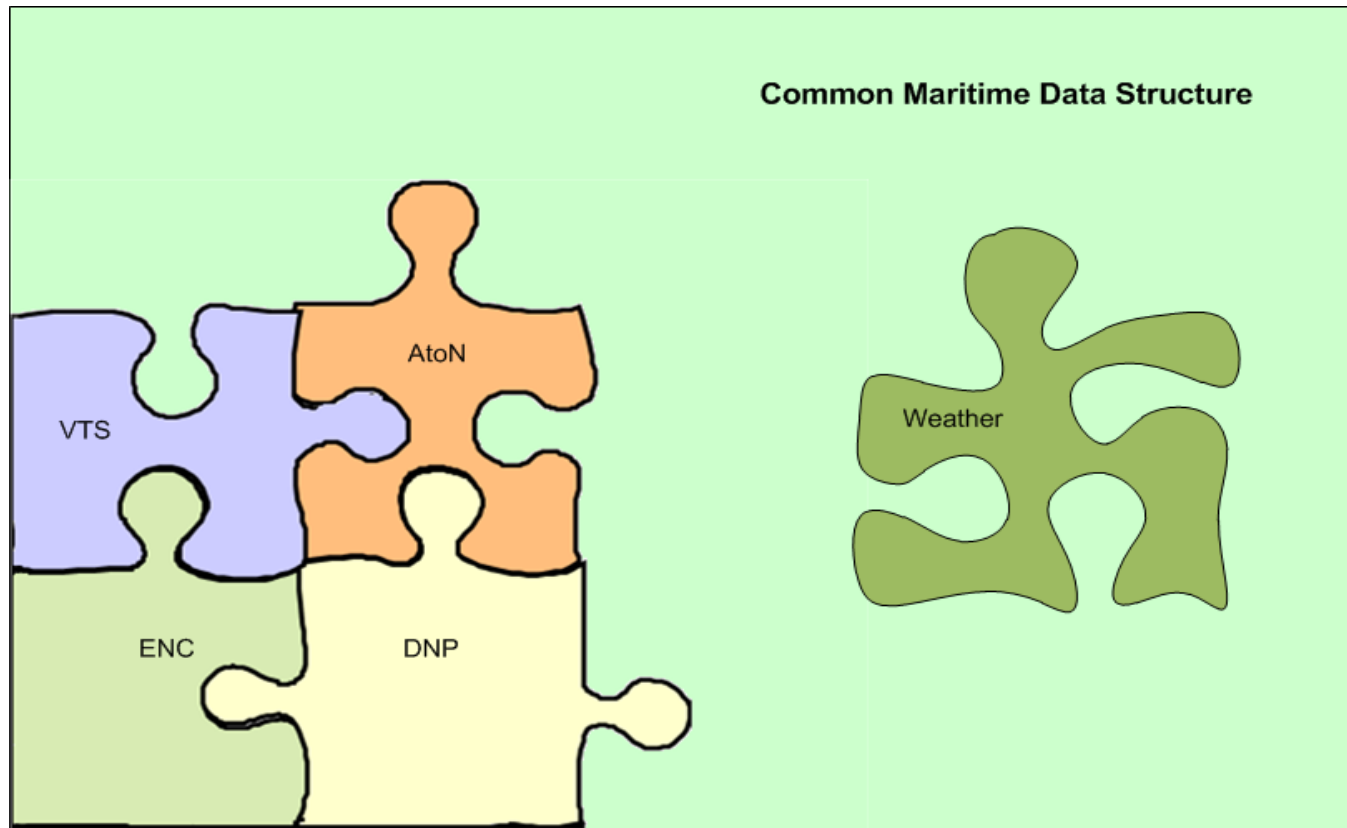
E-navigation developments relevant for inland navigation - I:

S-100 family:



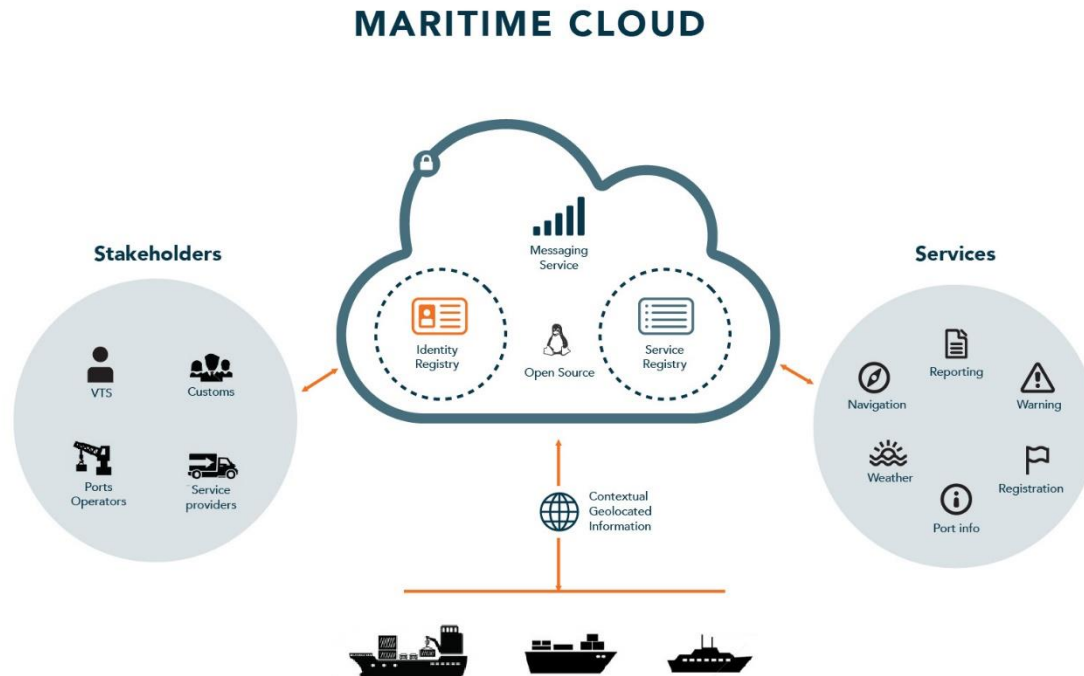
E-navigation developments relevant for inland navigation - II:

The Harmonised Common Maritime Data Structure:



E-navigation developments relevant for inland navigation - III:

The Maritime Cloud:



Conclusions

- General Conclusions
- Lessons learned e-Maritime
- Lessons learned e-Navigation in the Maritime WorldMaritime
- e-Navigation for Inland Waterways should be seen as one of the important evolutionary steps in the development of RIS and should not be seen as a separate development/implementation of RIS.

Recommendations - I:

- Maritime e-Navigation is just at the starting point of implementation, but nevertheless it was possible to formulate 23 recommendations.
 - **download the report for the details**
- Harmonization between the inland and maritime world is very important.
- Further development of e-Navigation for Inland Waterways should be focused on interoperability with maritime e-Navigation.
- Formal coordination between members of RIS and the maritime e-Navigation community should be established (new coordinating body or liaisons between existing bodies).
- Use the same terminology wherever possible or identify commonalities if different terms are used

Recommendations - II:

- Technologies like S-100, CMDS, Maritime Cloud, SOA introduced in the maritime transport mode are very useful for the inland waterways, for example as a building block(s) for a RIS registry(ies).
 - This should also increase the harmonisation and inter-operability between the maritime and inland transport mode.
- Evaluation is made on which recommendations can be useful for WG125.
- Due to the fact that maritime e-Navigation is still in full development and a lot of RIS related projects are ongoing update report WG156 in 3 to 5 years.

Thank you for your attention

Ir. Dierik Vermeir
Chairman WG156

ALSIC BVBA
Derbystraat 25
B-9051 Sint Denijs-Westrem

Tel: +32-9-265.91.11
Fax: +32-9-265.91.18

www.alsic.be
dierik.vermeir@alsic.be