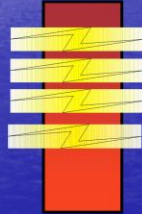


ARM 2 – Rapporteur Report M4

e-Navigation - shore side



“harmonized collection,
integration, exchange,
presentation and
analysis of maritime
information
onboard”



“harmonized collection,
integration, exchange,
presentation and analysis
of maritime information
ashore”

Gerry Brine - Manager Aids to Navigation
Australian Maritime Safety Authority

Source: IALA e-Nav Committee Information Paper on the draft
IALA Recommendation e-NAV 140 on the e-Navigation Architecture – the shore-based perspective (Ed 2)

IMO developments

In June 2015 MSC 95 will consider proposal to reduce 18 planned outputs in the ENAV Strategy Implementation Plan approved at MSC 94 to the following six outputs (Items 1-3 are the highest priority):

1. Guidelines on standardized modes of operation (S-mode) – **due 2019**
2. An update, by adding new modules, to the revised performance standards for Integrated Navigation Systems (INS) – **due 2017**
3. A revision of the Guidelines and criteria for ship reporting systems relating to standardised and harmonized electronic ship reporting and automated collection of onboard data for reporting – **due 2017**

The paper proposed six outputs on e-navigation as well as an amended High-level Action 5.2.6, “Development and implementation of e-navigation.” These are:

IMO developments

1. Amendments to the General requirements for shipborne radio equipment relating to Built In Integrity Testing for navigation equipment - **due 2019**
2. Guidelines on harmonized display of navigation information received via communications equipment – **due 2019**
3. Consideration of reports on development and implementation of Maritime Service Portfolios (MSPs) (and other e-navigation reports) by Member States and other international organizations

The paper proposed six outputs on e-navigation as well as an amended High-level Action 5.2.6, “Development and implementation of e-navigation.” These are:

IMO developments

- In Dec 2014 the Sub-committee On Navigation, Communications And Search And Rescue (NCSR) agreed a harmonized guideline related to e-navigation:

Guideline On Software Quality Assurance And Human Centred Design for E-Navigation

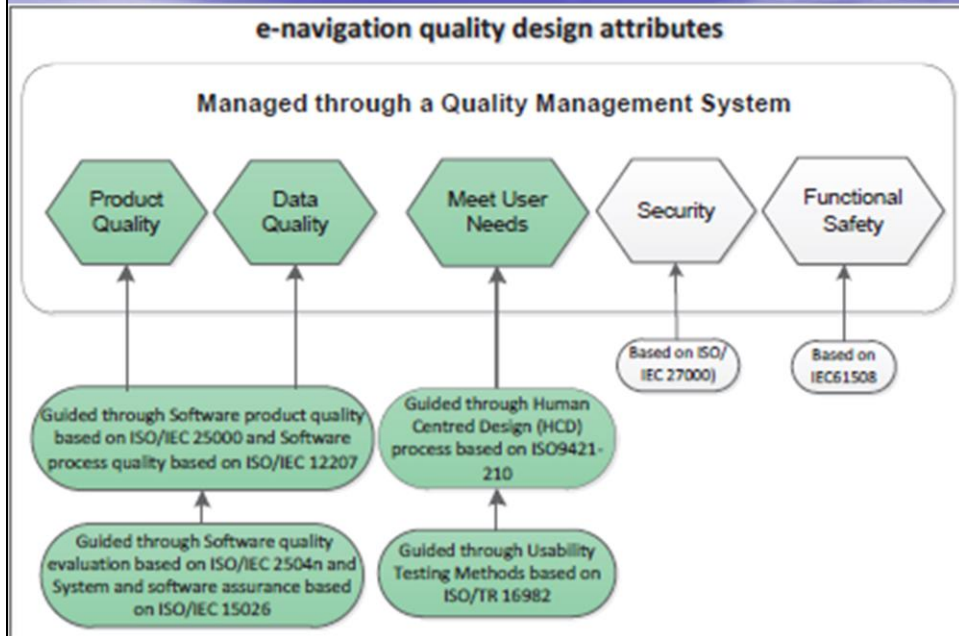
- Industry consultation occurred at the Software Quality Assurance (SQA) and Human Centred Design (HCD) Guideline workshop 20-21 April 2015 in Busan, Republic of Korea
- Draft guideline has been submitted to MSC 95 (June 2015)

This guideline is intended to be used by all stakeholders involved in the **design and development of e-navigation systems**, with its primary users being those that develop and test e-navigation systems. **Stakeholders** include equipment designers and manufacturers, system integrators, **maritime authorities and regulators**, shipbuilders, shipowners/operators, **Vessel Traffic Service authorities and Rescue Coordination Centres**, and other relevant international organizations such as the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and the International Hydrographic Organization (IHO).

The guideline aims to help ensure that e-navigation quality design attributes are included in the development of e-navigation systems. Figure 1 provides an overview of the quality design attributes that should be considered and includes "product and data quality", "meet user needs", "security" and "functional safety". This guideline mainly addresses software quality which incorporates "product and data quality" and "meet user needs".

The draft guideline provided the basis for Software Quality Assurance (SQA) and Human Centred Design (HCD) Guideline workshop held on 20 and 21 April 2015 in Busan, Republic of Korea. The aim of the workshop was to assist industry to understand and make use of the new draft IMO guidance on SQA and HCD.

Figure 1: Concepts and standards for e-navigation quality design attributes



This diagram from the draft guideline illustrates the proposed integration of technical and human centred design principles in e-nav systems

ENAV 16 Outcomes (Shore side)

- Developing guidance for IALA members on planning e-navigation test beds
- Demonstration of the R-mode using MF transmissions – potential future additional use of DGNSS infrastructure
- Developing generic risk assessment and management plan for implementing e-navigation services
- ITU Recommendation on the VHF Data Exchange System (VDES) well progressed
- Further developing the Maritime Service Portfolios (MSPs) with a future workshop proposed to Council to assist this process
 - Maritime Safety Information Service
 - Nautical Chart Service
 - Real time Hydrographic and Environmental Information Service

1. Develop guidance for the IALA membership on planning e-navigation testbeds.

This guidance document aims to provide project managers information on designing and planning testbeds and analysing results. Work will be carried out intersessionally, with the aim of finalising this guidance at the next session (ENAV 17, Oct '15).

2. Demonstration of the R-Mode (ranging mode, or provision of a ranging signal for determining a line of position) using MF (medium frequency) radio transmissions.

The proof-of-concept, led by Germany and UK (within an EU-funded project termed ACCSEAS), established that it is now feasible to use MF radio transmissions to transmit ranging signals to aid position determination. In the very near future, it is expected that authorities will be able to use their existing Differential GPS networks to transmit such ranging signals. The significance of this trial is that it offers a real prospect of a terrestrial positioning and timing alternative to the Global Positioning System (GPS)

3. Work commenced on a generic risk assessment and management plan for IALA members to use when implementing e-navigation services.

A working paper ON “The Structure of the Maritime Service Portfolio(S) (MSPs) is under development

”A Maritime Service Portfolio (MSP) is defined as “a set of operational and/or technical services” which are bundled together for a very specific purpose. Examples of specific operational services include VTS related services e.g. “Navigational Information Service (NIS)”, “Navigational Assistance Service (NAS)”, “Traffic Organisation Service (TOS)”

It has been recognized that the concept of the MSP comprises both services provided “by electronic means” and services not provided “by electronic means”. Since the IMO definition of “e-Navigation” is confined to provision “by electronic means”, it has been recognized that the concept of the MSP transcends the scope of “e-Navigation”.

VDES

VHF Data Exchange System (VDES) is a technological concept originally developed to address emerging indications of overload of the VHF Data Link (VDL) of AIS and simultaneously enabling a wider seamless data exchange for e-navigation, potentially supporting the modernization of GMDSS, both processes that are currently developed by IMO. VDES is capable of facilitating numerous applications for safety and security of navigation, protection of marine environment, efficiency of shipping and others.

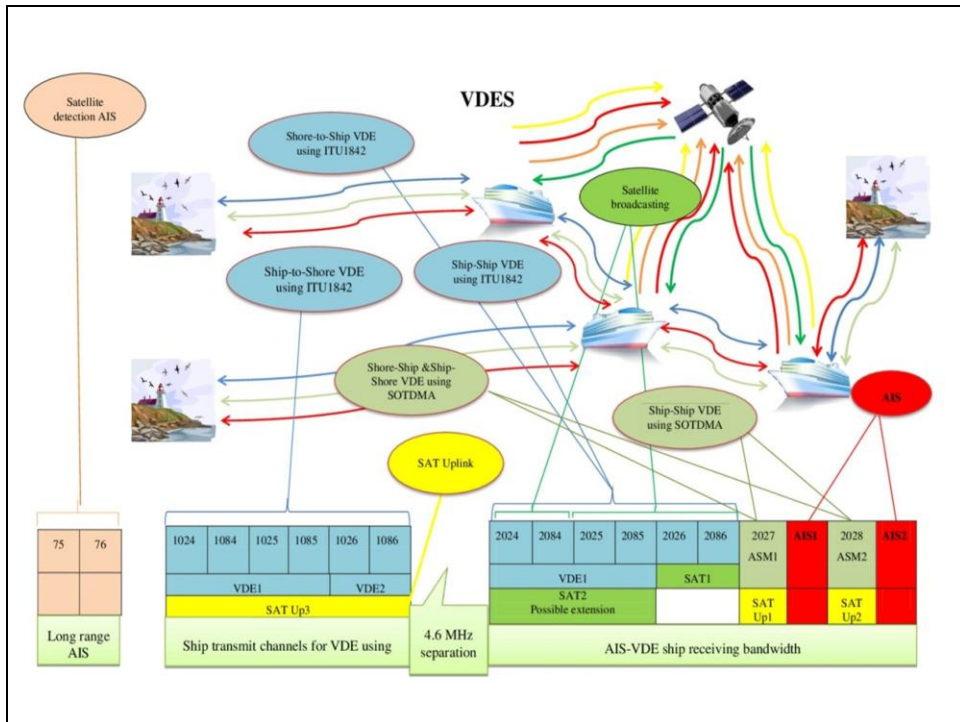
**Sourced from ENAV 15-10-1 Information Paper on VHF Data Exchange System*

VDES

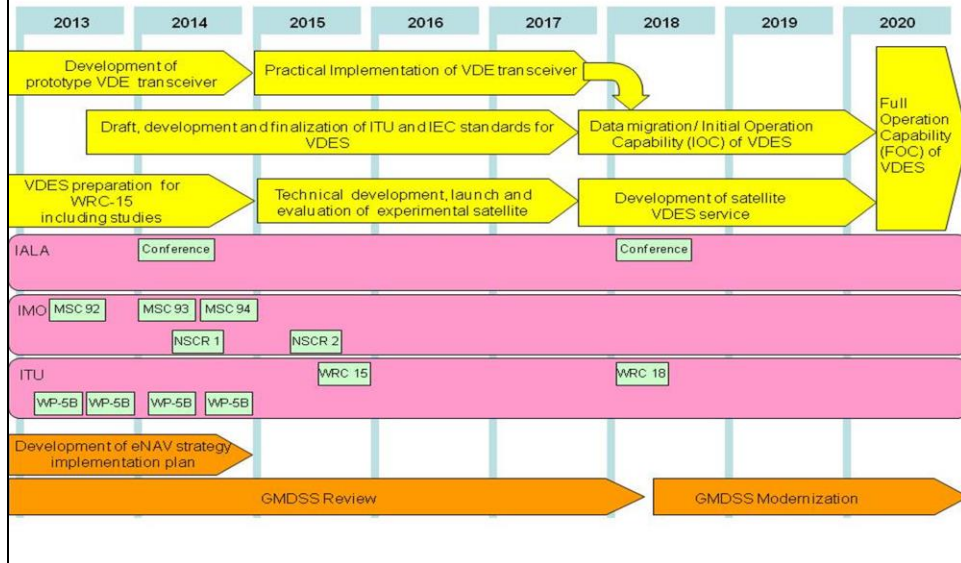
2009 - ITU issued Recommendation ITU-R M.1842-1 *"Characteristics of VHF radio systems and equipment for the exchange of data and electronic mail in the maritime mobile service RR Appendix 18 channels."*

This technique will provide higher data rates (up to 32X) than the present AIS and will become core element of VDES.

VDES network protocol will be optimized for data communication so that each VDES message is transmitted with a very high confidence of reception and more efficient and effective use of marine VHF spectrum.



VDES Roadmap



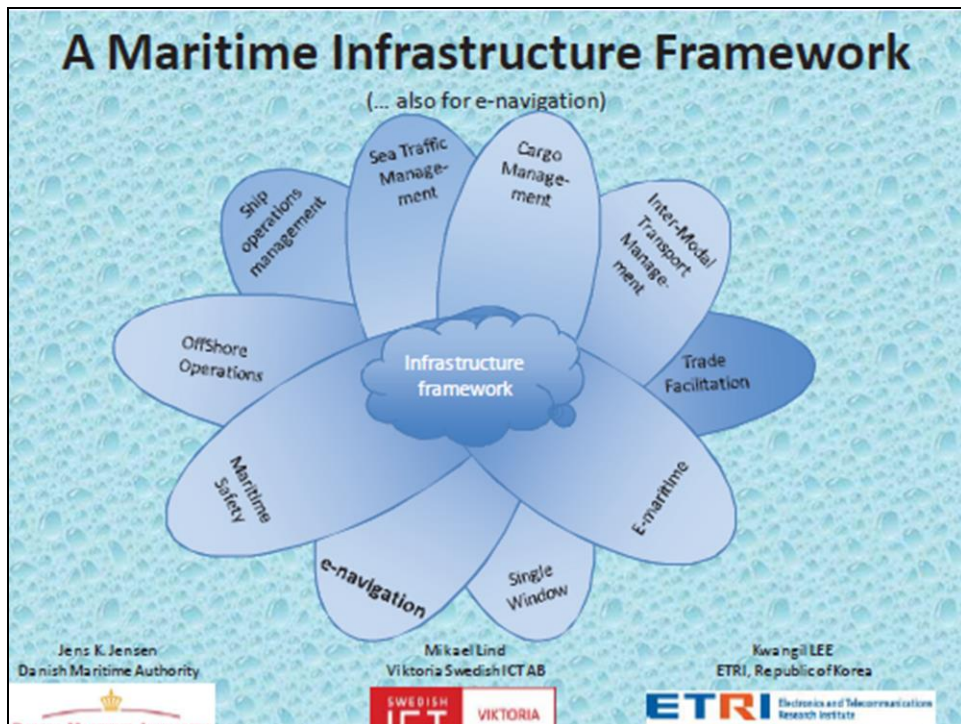
ENAV Communications Working Group							
Task	Start Session	Planned End Session	Revised End Session	Progress Indicator			Status Overview
				Green	Yellow	Red	
TD#1 – Operations							
1.4.1 Develop VDES Message Structures	17	21		☒	☐	☐	Commence ENAV20
1.4.2 Develop e-NAV Message Structure	17	21		☒	☐	☐	Commence ENAV20
2.1.1 Update the Marine Radio Communication Plan	20	21		☒	☐	☐	Commence ENAV20
2.1.2 Develop Recommendation on VDES	15	21		☒	☐	☐	On-going
2.2.1 Update Recommendations and Guidelines for AIS	15	21		☒	☐	☐	On-going
2.3.1 Manage Application Specific Message (ASM) catalogue	16/20	17/21		☒	☐	☐	Commence ENAV16 and 20
2.4.1 Monitor Developments with GMDSS Modernization	15	21		☒	☐	☐	On-going
* On target, behind target but under control behind target needs action							

Significant progress has been achieved on developing a comprehensive user requirements document that can be used by industry to build the VDES technical elements.

The goal is to ensure operational requirements are clearly identified, so that the technology doesn't develop simply for 'technology sake'. As such the WG comprises both regulatory bodies and industry representatives

Further development of the Potential New Draft Report for VDES.

The work on this 'PDNR' was forwarded to the International Telecommunications Union (ITU) in May 2015 to form the basis for the full report for VDES. This report is required to be forwarded to the World Radio Conference (WRC) 2015 in order to ensure continued access to the spectrum, which was originally identified at WRC 2012 for 'trial' purposes.



A presentation was made at ENAV 16 which outlined some key aspects of the Maritime Cloud

International e-Navigation Underway 2015
The Implementation Phase?



Conference conclusions

- e-Navigation must have clear benefits which have to be better communicated.
- The focus of e-Navigation in the near future has to be on getting accurate, useful and timely information to the navigating mariner.
- There is a need for a functional relationship between industry provision and the regulatory framework to reap the benefits of e-Navigation.
- The Maritime Cloud is moving from conceptual to development phase in various regions through demonstration projects.

International e-Navigation Underway 2015
The Implementation Phase?



Conference conclusions (cont.)

- The future development of e-Navigation must be specific, measurable, achievable, realistic, time-based and clear to all stakeholders.
- e-Navigation should reduce the workload of the mariner by automating routine tasks, allowing the mariner to focus on situational awareness and the main task of navigating.
- The risk of cyber security issues should be considered in the implementation of e-Navigation.
- Successful national-level training awareness models should be replicated and should include basic computer literacy.

Upcoming E-Nav events



**e-Nav**
underway 2015
NORTH AMERICA

SEPTEMBER 28-30
SUNY MARITIME COLLEGE
BRONX, NEW YORK

REDUCING RISK THROUGH e-NAVIGATION:
How e-Nav can improve conning decisions
For Additional information go to www.e-navnorthamerica.org
or contact enavunconference@gmail.com

- **REGISTER NOW!**
Early registration ends June 1st.
- **CALL FOR PAPERS.**
Deadline June 1st.
See Details on website.
www.e-navnorthamerica.org





Thank you for your attention