

Paper for Consideration by NIPWG5

Report of the International E-navigation Underway Conference: 24-26 Jan 2018

Submitted by:	UK
Executive Summary:	The conference provided a summary of e-navigation developments.
Related Documents:	E-navigation 2018 Report.
Related Projects:	EfficienSea2; STM Validation; SMART Navigation; SESAME2;

Introduction / Background

This was the 8th in the series of International E-navigation Underway Conferences. Although E-navigation Underway conferences now take place in SE Asia and USA, this is probably still regarded as the main international e-navigation conference.

The conference provides an update on the main international e-navigation initiatives and provides an opportunity to network with the main e-navigation players.

The conference is jointly managed by IALA and the DMA (Denmark) with supporters listed as CIRM, The Nautical Institute, IHO and BIMCO. The International Chamber of Shipping has been a sponsor in previous years, but has withdrawn its support this year.

As with the previous seven in the series, the conference took place on board the DFDS ferry M/S PEARL SEAWAYS, during which time she sailed from Copenhagen to Oslo and then returned to Copenhagen. This provided a very good environment and very good opportunities to meet with speakers and delegates, albeit rather rough seas during the first night!

The theme of this year's conference was '**The realization of the Maritime Service Portfolios**'.

The report of proceedings, including summaries of each of the presentations, and links to slides, is available on the IALA website at <http://www.iala-aism.org/content/uploads/2018/02/Report-e-Navigation-Underway-International-2018-final.pdf>.

The conference was attended by 144 delegates, representing 29 countries and 7 international organisations.

Analysis/Discussion

Before the event the conference was announced as having a focus on the following themes:

- Issues relating to the IMO/IHO Harmonisation Group on Data Modelling (HGDM)
- Including definition of MSP's and S-100 product specifications
- e-Navigation and autonomous operations; complementary technologies?
- Practical solutions from testbeds
- Infrastructure and communication means in support of e-Navigation
- e-Navigation services in the Polar regions
- e-Navigation and big data
- Advances in S-mode
- Maritime Service Portfolios (MSP)

All these themes were covered to some extent, but perhaps not to the level that was hoped for when planning the conference.

The sessions delivered were:

- Opening session, including:
 - IMO's plan;
 - Status and plan of the Harmonisation Group on Data Modelling;
 - IALA ENAV committee;
 - S-100;
 - S-Mode;

- Session 1: E-navigation projects and testbed (6 presentations)
- Session 2: Autonomous solutions in the maritime domain (3 presentations)
- Session 3: Specific e-navigation solutions (3 presentations)
- Session 4: Building blocks for e-navigation (4 presentations)
- Panel discussion.

In his opening address Andreas Nordseth, DMA, said that results from e-navigation projects are not making a difference to life at sea. He raised an increasing concern about cyber security, and considered that we are at the doorstep of a technology jump, with the challenge of how to implement it within the marine domain.

The key note speech from Mr Niels Smedegaard, CEO and President of DFDS, Denmark, focused on business drivers, and particularly how technology enables disruption (e.g market value of amazon grew by 1934% in 10 years; Tesla by 1405% in 5 years). Also, that there is a danger that the rate of change of technology is outpacing human ability to adapt, with reference to autonomous vessels, augmented reality and blockchain.

The IMO paper by Sascha Pristrom, was titled “Making headway: IMO's plan to lead shipping into a new digital era”. This is more than e-navigation, including the Polar Code, GMDSS modernization, and amendment to the FAL convention. E-navigation aspects are focusing on Harmonised Display, Maritime Services, S-Modes and an update to the e-navigation SIP. Of user needs listed, the following are relevant to NIPWG:

- User selectable information received via communication equipment; and
- Automated updating of data and documents.

Conference themes of particular interest to NIPWG:

- **Harmonisation Group on Data Modelling (HGDM)**

Mr Sunbae Hong, Head of e-Navigation Development Task Force, Ministry of Oceans, and Fisheries, Republic of Korea, the chair of the Harmonisation Group on Data Modelling gave a report of the first meeting, stating that he expected there to be a second meeting in October 2018. The current emphasis is to “Develop guidance on definition and harmonization of the format and structure of Maritime Service Portfolios (MSPs)”. This includes the design of a template for defining a proposed MSPs, now call Maritime Services, a “Portfolio” was considered confusing. S-100 domain coordination bodies are requested to submit their definitions of Maritime Services to the HGDM to test the use of the template.

- **Maritime Service Portfolios (MSPs)**

Despite the stated theme of the conference, there was very little mention of Maritime Service Portfolios (now called Maritime Services) from the speakers’ presentations.

During the closing panel discussion, this was raised in a question: ‘why haven’t we discussed them more?’

Answers/comments from the panel and the floor included:

- Discussion at HGDM hasn’t delivered the guidance yet;
- What has not been determined yet is the consequences for service providers;
- ‘I’m convinced that they are not responding to user needs’;
- ‘We are losing the credibility of e-navigation by the lack of definition of MSPs’.

Another question was ‘what could the business case be for the most attractive maritime service?’ The answer from the panel was ‘although we have demonstrated potential, we have failed to communicate the business case.’

- **Maritime Connectivity Platform (MCP)**

The Maritime Connectivity Platform was hardly mentioned other than briefly referred to without explaining what it is or how it works. A live demonstration was provided from the bridge of the ferry, as part of the STM Validation project, but out of three demos, it only worked once - the reason for failure being given as an unstable internet connection. It was acknowledged that it is only fit for trials and that more maturity is required to make it commercial. Governance issues of ownership, management and liability have not been suitably addressed.

- **Autonomous shipping**

There was a very good presentation by Maersk from Michael Rodey, Senior Innovation manager, which outlined Lloyds six levels of autonomy, ranging from AL1: decision support, to AL6, zero human interference. The point was well made that autonomy doesn't mean unmanned. Michael stated that "Autonomy" is not a goal in itself, but a potential contributor to improve the safety, reliability, and efficiency of operations. He explained that a complete evolution of modern vessels is needed for true autonomous ULCVs, and that it can only be designed-in during ship build, rather than added on. Autonomy benefits are not currently calculatable, although the cost is. He stressed the importance of being able to tie innovation to business cases, without which, business will not invest.

Michael described how Maersk sees situational awareness as a key first step to realising the goals of e-navigation. Situational awareness is the ability to gather and interpret data on the external environment to allow the humans or machines to fully comprehend what is happening around the vessel. A situational awareness project is about to start on a container ship using LIDAR, optical sensors, RADAR, IR etc to build up a digital picture around the vessel. A request has been submitted to the DMA to seek approval to replace the need for line of sight from the bridge with the use of cameras. This would allow additional containers to be carried. This led to an interesting outline of future bridge positioning - firstly, to the bows, but ultimately to below deck and on-shore.

Presentations from AMSA and the UK Marine Alliance covered the regulatory issues, noting that regulations need to keep up with technology. Maersk wastes thousands of hours a week waiting for pilots and so sees benefit in a future with shore based pilots (remote pilotage).

- **Maritime Resource Names (MRN):**

Minsu Jeon, Technical Operations Manager, IALA, described the naming scheme that can be used for uniquely identifying any maritime resource on a global scale. MRN is based on the concepts of Uniform Resource Identifiers (URI) which is a cornerstone of the Internet. It is now registered with the Internet Assigned Numbers Authority (IANA). There was no indication of any real use at present.

E-navigation projects to keep an eye on:

- **SESAME Straits e-navigation Test Bed:**

Todd Schuett, Project Manager, Kongsberg, Norway, outlined this Norwegian-led and funded project. Sesame 2 builds upon the Marine Electronic Highway testbed that has been running since 2006. With a focus on just-in-time arrival, the testbed is developing route sharing with VTS, to identify potential hotspots of congestion, and thus to provide advise on speed/route to reduce waiting time. Aimed to use VDES, but only installed on a single ship. Three ships in trial. Collaboration with the MCP and STM.

- **SMART navigation:**

Seewong Oh, Senior Research Engineer, KRISO, Republic of Korea described this five-year project focused on reducing incidents of accidents involving small vessels. With 13 work packages, the SMART-Navigation Service will deliver six services by 2020, including a Marine Information Service using the MMS (Maritime Messaging Service) of the MCP. It will depend on S-122; S-123; S-124 etc.

- **EfficienSea2:**

Chris Saarnak, DMA, outlined examples of project developments: Smart Buoys for the collection and distribution of environmental data; conversion of NAVTEX to digital navigation warnings, now available on the DMA web site; S-57 to S-101 prototypes - sample data due to be available in March 2018; and VDES based route exchange. The Project comes to an end in March with a final conference on 5-6 April 2018.

- **Sea Traffic Management validation project (STM):**

Per Setterberg, Operational Project Manager, Swedish Maritime Administration described how STM is not a project but a programme looking out to 2030. The current project is evaluation only. Other collaborative initiatives and future projects will implement. The presentation majored on the confusion caused by a proliferation of standards, the lack of coordination, and the need for international governance. A convergence of initiatives is promoted by a letter of collaboration signed in October 2017 between STM,

SESAME and SMART navigation (Sweden, Norway and the Republic of Korea). There is also coordination between STM and the Port Call Optimisation International Taskforce, and EfficienSea2.

Michael Bergmann gave a report on PortCDM (Collaborative Decision Making), practical use, governance and standards. Initially developed during the Mona Lisa project and based on aviation best practices, the aim is to share data between all Port Call Actors to enable collaboration to reduce total turnaround time in port. An International PortCDM Council (IPCDMC), chaired by Michael, are preparing the way for implementation of PortCDM in ports around the world. The business case is sound due to the improved reliability of port calls and thus reduced costs, but not easily realised due to the commercial relationship between actors.

Conclusions

The executive summary of the conference report lists the following six highlights:

1. Ship-owners have clearly realised the potential and business cases in e-navigation both in the areas of safety, efficiency and cost reduction.
2. Increasing attention is being paid to harmonised standards for services and products which are necessary for e-navigation.
3. Disruption of the maritime industry driven by exponential technological change demands faster stakeholder and regulatory response to achieve the benefits of new technology for human needs.
4. There is increasing collaboration between test bed operators, leading to an acceleration in the realisation of new digital maritime services and connectivity infrastructure.
5. Several major projects and global test beds have tested VDES with good results using both terrestrial and satellite platforms. VDES prototypes are now on the way for use on ships and ashore.
6. Autonomous systems, driven by the business case, are becoming operational and authorities and organisations must prepare.

Looking back at the original conference intentions (as listed on page 1 of this report), the conference didn't provide much information about S-100 product specifications, communication means, big data or MSPs.

Reoccurring issues included:

- Little real impact on life at sea;
- Lack of business cases to gain investment from industry;
- Difficulty of regulations keeping up with technological potential.

Discussions in the margins often mentioned how e-navigation is not really having any impact, and that the various projects are good at developing test infrastructure, and principles but with little substance behind them. It was commented that the International Chamber of Shipping was not present because they are frustrated by the lack of progress.

Recommendations

NIPWG is recommended to continue to monitor international e-navigation developments and plans, to assess their relevance to the IHO, particularly in terms of the development of S-1xx product specifications, and definition of future hydrographic Maritime Services.

Justification and Impacts

To help establish, and align with IHO strategic direction.

Action Required of NIPWG

The NIPWG is invited to:

- a. note the conference report;
- b. take any action considered relevant.