



NAUTICAL INSTITUTE BRANCH REPORT

E-NAVIGATION – MARKET TRENDS AND DEVELOPMENTS

The Cyprus Branch organised a 1/2 day seminar on 8th May 2014 at the L'Onda Beach Hotel in Limassol entitled 'E-Navigation - Market Trends and Developments'. Attended by 65 delegates including members of the Branch as well as people from the ship management community in Cyprus, the seminar aimed to clearly identify what E-Navigation is, what the views of serving seafarers are and then to look at the various developments from the point of view of the suppliers and manufacturers.

The event was sponsored by Chartworld and Global Navigation Solutions and the Branch would like to express their thanks to the Sponsors.

All papers can be found on the Cyprus Branch website.

There were 5 speakers as follows

Development of E-Navigation by Socrates Theodossiou, Co-ordinator CSC E-Navigation Working Group.

Socrates began by explaining the aims of the CSC working group , which includes following up on the development and submitting comments to the ICS and IMO and getting involved in the future development including even a project to work on IMO test beds. Socrates then explained the concept - to increase safety and security in commercial shipping through better organization of data on ships and onshore including better data exchange and communication. Considered as a 'berth to berth' process, E-Nav will also ensure protection of the marine environment. He then went on to look at a 15 year time line showing the growth of the world fleet as well as IMO Casualty Statistics. These showed there had been a general improvement since 2006 for all ship types. This raises the question - will further development of such technology have a dramatic/justifiable improvement on safety? Socrates then looked at the various test beds that are already up and running including ACCSEAS, EfficienSea and IONO to mention just three. We then watched a short video presentation on the MonaLisa Project (Motorways and Electronic Navigation by intelligence at Sea). This video is very informative and can be found on the website www.sjofartsverket.se/en/MonaLisa

Socrates then explained where we are going and mentioned some of the eight core elements of the strategy/implementation plan - responsibilities, transition arrangements, funding, engaging stakeholders and defining user needs.

In essence, what this means is that data will be displayed in electronic format, it will minimize navigational errors and therefore accidents, it will raise standards of safety and accuracy to a level commonly found in the air industry and it will use common standards and protocols.

Socrates then raised some points for consideration. Some stakeholders and administrations have aspirations for the system to be used for monitoring, controlling and reporting. Is this what E-Navigation is really about? Could it be that electronic equipment is not the cause of accidents but rather that accidents are the result of too much administrative burden and distractions on board. If this is the case - will E-Nav really solve the problem? Did the industry learn anything from the ECDIS lesson? If the problems of ECDIS are repeated then we will not help ships but hinder them. Finally, shall E-Navigation be left to the shipping industry and suppliers to develop or do we need to engage other stakeholders such as Ports and terminals?

In concluding, Socrates asked whether maritime security was also to be an issue and pointed to three recent issues which perhaps show that e-technology might not be able to live up to expectations - the failure of the GLONASS system on 4th April 2014, the use of ELORAN GPS and the missing Malaysian Airlines flight MH370.

E-NAVIGATION – The Master’s point of View

Capt. Valentin Mavrinac is AFNI, QSHE Marine Superintendent at COLUMBIA SHIPMANAGEMENT Limassol, Cyprus

His presentation summarized the feedback of 88 management level deck officers, mainly masters. An E-NAV feedback questionnaire has been distributed amongst the officers of several shipping companies serving on board various types of vessels. The questionnaire had a dual purpose – to introduce the E-NAV concept and to challenge critical thinking towards safety of the modern electronic equipment used on board merchant vessels. We expected more an objective opinion than a ‘verdict’ from the seafarers who took part in the research. There was no age group specified, however according to Capt. Mavrinac only 4.5% from all the participants in the research were ‘too old’ to be worried about the E-NAV era and expecting to be fully retired when it hits the world fleet.

In general the majority of the officers were positive about the E-NAV regarding:

- Improvement of safety of navigation
- Increasing energy efficiency
- Information availability and data exchange
- control and tracking of the vessel movement from berth to berth
- implementation of the traffic corridors and shore based control even for deep sea navigation

Major points of concern of the Masters highlighted in the presentation were:

- losing the freedom of decision making - when the shore operator will take over
- data reliability – when the small objects, unexpected obstructions cannot be detected by the radar or satellite used by the shore operator
- information overload – when the volume of information to support the decision making cannot be absorbed by the end user
- electronic equipment diversity – non standardized equipment, non-user friendly
- human error – will E-NAV be able to reduce the consequences of it?

Surprisingly the expected increased volume of training for the new electronic equipment was not a matter of concern for the masters. The most preferred methods were CBT and ‘trickle-down’ (on board) training methods according the results of the research.

Admiralty E-Navigation and S-100 by Jonathan Pritchard, Product Research and Development

Jonathan began by explaining that E-Nav means change. While the basic regulatory environment (SOLAS, ISM, planning and inspection) might not change, the underlying formats and data, the interactions between ship and shore and the functions and facilities available to end users could well change. The architectural elements of E-Navigation are highly complicated and while the end user does not need to know about the elements, he should be aware about the complex processes behind the screen. ECDIS adoption has been a necessary 'foundation' layer as ENC's become a component in a much bigger system. Jonathan then explored the IHO S-100 standard, which has been in development for many years and is not new. The standard is based on geospatial data standards and allows data systems to work better together. It is cheaper for systems manufacturers to embed their software products. S-100 capabilities include no more hardwired dictionaries and symbology, compatibility with ISO standards, registries of features, attributes and properties. Jonathan said that all ENC's will eventually transfer to S-100 standards and that an integrated S-100 bridge should allow multiple sources of information to co-exist and be presented to a user as a unified whole - not a set of parts. He further recommended that this standard be driven by end user demand rather than being imposed on the marine community still trying to deal with mandated ECDIS. So now was a crucial time for E-Nav and S-100 because of competing standards which might lead to numerous formats (such as ECDIS systems). Universal adoption by all players is considered essential.

Jonathan then went on to explore the possibilities. For data, users could enjoy denser bathymetry where available, port entry and exit information, realtime updates on buoyage, lights and routing networks. For functionality, users could enjoy enhanced collision avoidance information, 'no go' areas, resilient positioning and better planning, scheduling and organisation. He then showed us examples such as an electronic chart with dynamic 'no go' areas using tidal and current inputs.

In concluding, Jonathan explained that the UKHO is already extensively involved with various E-nav testbeds projects. He said that E-Nav was reaching a crucial stage for 'buy-in' and that the IMO plan is well formed with a draft infrastructure. There will be adoption of the next generation of standards, underpinned by S-100 and there will be much greater demand for better automation and integration of electronic aids to navigation. Vessel bandwidth will increase but not ALL changes of technology will be relevant to ALL vessels. An 'elective' rather than a 'mandated' service to the industry should be encouraged.

Voyage Management Software in the E-navigation format

Mike Bailey is Development Manager at Global Navigation Solutions (GNS) London, UK.

Mike Bailey presented the E-Nav concept from the navigation software manufacturer's point of view introducing the products and services provided by the GNS in order to assist the modern navigator. The highlight in his presentation was the voyage optimisation tool which allows the navigator to plot the route directly onto the official ENC's on board, and then export the completed routes direct to the ECDIS; to have all important NAVAREA Warnings updates and the Notices to Mariners in digital format; to use weather application with meteorological maps for optimising the route and to use the advanced passage planning and checklist tools in maintaining compliance with safety management requirements.

Another point in the presentation was the use of the integrated bridge system concept for managing the e-Navigation. Proper arrangement of the interconnected electronic systems on the navigational bridge is required in order to provide efficient voyage planning and execution. Mike Bailey presented an exemplary diagram of the ergonomic bridge design which allows efficient voyage control. Mike completed his presentation with a short review of the next coming developments and challenges for e-Navigation like the exchange of information

between ship and shore by electronic means to support the ship management role and enhance navigation. Also he introduced some future concepts for the information display on the navigation bridge.

E-Navigation – A look into the Future from the Maker’s perspective – Panos Antoniadis, Sales Manager, Chartworld

Panos was tasked to give the audience some ideas on

What might an integrated E-Nav console look like?

Panos advised that e-nav would most likely be implemented when the ‘communication bottleneck’ is sorted out and vessels can receive and transmit data at acceptable cost levels. VSAT and other products like Global Xpress (worldwide high speed broadband) are definitely the right direction. Devices might include such things as tablets, google glasses, window head up displays and one operator workstations. Products such as eGlobe Connect are already providing automatic data exchange between ship and shore. A product called ‘e-mate’ is already helping the OOW with his daily work programme by providing all kinds of navigation, electronic chart info and communication.

What will it do and how will it interface with the user?

User defined settings through S-mode and a lot more decision supporting options will be available. There will be better alarm management to cut out unnecessary alarm information. The system will make better operational suggestions to the User. The audience were asked to look into <http://www.interschalt.de/en/fleet-operation-centre-bridge.htm>, which showed a state of the art fleet operation centre where the vessel is monitored.

How will data be displayed and information overload prevented?

Nobody is very clear on this point at the current time. S-100 was created to offer an open modular platform. Overload could be prevented by adding user defined profiles, intelligent alarm systems as well as support from ashore.

What is the investment for the shipowner?

Panos advised that this was a tricky question since we need to know from where the e-navigation starts. Integrated bridges are currently costing in the region of USD\$50,000 with fleet operation centres costing USD\$100,000. Much will depend on the development of future technical equipment.

Could existing products be modified?

This is unlikely since new hardware is needed approximately every 5 years to meet the latest software developments. Therefore it is likely that more equipment will be needed.

The seminar ended with thanks to the Speakers and small gifts were given to each one. The Speakers and delegates adjourned to the Terrace for further discussions over drinks.

Contributions by Captain Martin Bankov, Graham Cowling and Captain VS Parani.