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03 Issue

e-Navigation News

IMO ENAV UPDATE









December 2014 www.cil.ie +353 1 2715500 e-Navigation



Welcome to Issue Three of e-Nav news, This issue will focus on advancements in the DBDD demonstrator, future changes, Spar buoys and differential e-Loran.

Your feedback is esential to ensure the on-going development of e-Navigation is user focused. We welcome any feedback that you may have, navigation@cil.ie









CONTENTS

E-NAVIGATION NEWS





The International Maritime Organisation's Maritime Safety Committee approved the e-navigation Strategy Implementation Plan (SIP) at its ninety fourth session in November 2014.

B CHANGES IN NAVIGATION

Will marine navigation as we know end, and will people drive ships as they do car, trains or trucks?

C SPAR BUOY TRIAL

Originally part of the Finnish Maritime Administration, Meritaito Ltd is now a state-owned company specialising in the maintenance and development of waterways and marine infrastructure. CIL are working with Meritaito as part of the Dublin Bay Digital Diamond Project to carry out performance and survivability tests on spar buoys in Irish waters.

D DIFFERENTIAL ELORAN

The generation of differenital Loran corrections is very much an integral part of e-Loran.

E DBDD PROJECTS

Current live projects and prgoress update in the DBDD demonstrator.



A clear and compelling need to equip the master of a vessel and those ashore responsible for the safety of shipping with modern, proven tools to make maritime navigation and communications more reliable and user friendly and thereby reducing errors





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IMO E-NAV UPDATE

UPDATE

You may remember from e-Nav news issue two the IMO have listed 5 main e-Nav solutions in their strategy implementation plan

S1 improved, harmonized and

user-friendly bridge design

S2 means for standardized and

automated reporting

S3 improved reliability, resilience

and integrity of bridge equipment

and navigation information

S4 integration and presentation

of received information in graphical displays

S9 improved Communication of

VTS Service Portfolio

The International Maritime Organisation's Maritime Safety Committee approved the e-navigation Strategy Implementation Plan (SIP) at its ninety fourth session in November 2014, this is the main deliverable from 8 years of work by the IMO on e-navigation to date.

It is planned to better prioritise the tasks identified as follows:

• Review each of the tasks listed in the SIP with a view to reducing the number of outputs

• Prepare each reviewed output in SMART objectives

• Prepare a comprehensive prioritised plan of work including timeline for each output

The next step is to submit this information to the 95th Maritime Safety Committee Meeting.







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CHANGES IN Navigation

E-NAVIGATION

We have entered the Age of Digital Navigation which to ensure a harmonised evolution of systems we have labelled e-navigation. These systems on board and ashore will define how ships move from point to point in the future. E-Navigation and the future provision of Aids to Navigation are interlinked. Existing visual and electronic aids such as RADAR Transponders and Augmented GPS will still play an important but supplementary role in navigation.

A fundamental part of e-navigation is the Automatic Identification System (AIS) which is one of the most significant technological advances in the last 50 years and the Marine Industry is still finding innovative ways to apply its capabilities. In order to make full use of the system we believe regulators will need to expand the mandatory carriage of AIS to all vessels and provide mariners with access to a nationwide network of transceiver AIS sites. As more vessels become electronically identifiable from shore we would expect an expansion of marine traffic management to encompass an all vessel monitoring system around the entire coast. At the moment AIS is provided through Marine based frequencies but in the longer term, global broadband and local WiFi are likely to be widely available to make communications more accessible and with greater capabilities.

The digital evolution will mean inexpensive, easy to operate and reliable equipment for the vast majority of vessels. This coupled with new regulations of minimum carriage and possible competence requirements for non SOLAS vessels will help define future aids to navigation requirements.

So the majority of vessels navigational capabilities and systems will effectively merge. This will have an effect on the widespread usefulness of virtual aids to navigation which at the moment are only considered appropriate in specific and rare circumstances. For smaller vessels personnal electronic devices such as smart phones will be increasingly employed. Mobile devices will allow mariners bring their navigation systems to sea with them. (Many professional Pilots already do this).

We already see advancements in on board technology such as Head up and Augmented Reality Displays that will make marine navigation relatively uncomplicated and accessible to all. To ensure international usability and system uniformity default systems such as S-Mode will be incorporated into on-board integrated navigation systems.

One fundamental question will be; will marine navigation as we know it end and will people just drive ships as they do cars, trains or trucks.





SPAR BUOY TRIAL

FEATURE



CIL has just taken delivery of two new Spar type buoys. These Buoys will be established in close proximity (within 300 meters) to the Bennet Bank and West Blackwater stations. The spar Buoys will have the same light and daymark display as the existing buoys.

Originally part of the Finnish Maritime Administration, Meritaito Ltd is now a state-owned company specialising in the maintenance and development of waterways and marine infrastructure. CIL are working with Meritaito as part of the Dublin Bay Digital Diamond Project to carry out performance and survivability tests on spar buoys in Irish waters. These types of Buoys can be used in an e-Nav context for the use of sensors in particular on constant tension mooring buoys in order to provide the mariner with real time data.

The buoys are expected to be deployed by Granuaile in early 2015. Apart from the difference in structural profile and performance we will test the suitability of prestressed moorings. As with most countries that have to contend with ice on their waterways Finland has found Spar (tube) type buoys to be the best design for dealing with ice flows. While the slim profile is particularly well suited to ice conditions they can suffer from conspicuity problems when compared with conventional buoys.

Mertaito are interested to see how their Spar type buoys would perform in ice free waters outside the Baltic region and we are interested to see how their buoys and associated systems would perform in comparison with our own designs and mooring arrangements.

Following discussions with our Finnish counterparts, it was agreed that lessons could be learned from both parties in formally testing the suitability of Spar buoys in ice free waters. While theoretical analysis has its values, it was felt that there is nothing quite as authentic as testing in the real environment.



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Spar buoys in ice free waters. While theoretical analysis has its values, it was felt that there is nothing quite as authentic as testing in the real environment.









International Loran Association: Enhanced Loran (eLoran) Definition Document Dated 16 October 2007

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Improved realiability, resilience and integrity of bridge equipment and navigational information

D-ELORAN

SECURITY



Loran receivers compute their position based on the Time of Arrival of Loran signals from a number of Loran stations. These Loran signals do not travel at a constant speed and therefore position inaccuracies arise due to delays in signal propagation of the signal as it travels across different terrains from the different transmitting stations: over sea, mountains, lakes, arable land, marsh land etc. and also over snow or ice during winter. These delays are referred to as ASFs or Additional Secondary Factors.

and DLoran is how the data gets to the mariners receiver. For DGPS it is a separate differential transmission, such as the IALA Radio Beacon system. For a trial reference station in the Dublin Bay Digital Diamond, the data will go over the internet via a secure connection to the eLoran transmitter at Anthorn in Cumbria. This eLoran station then sends out the corrections modulated onto the Loran Data Channel within the Loran signal itself. Therefore any eLoran receiver in the DBDD area that can receive the Anthorn signal, will have DLoran.

The difference between DGNSS

The generation of Differential Loran corrections is very much an integral part of eLoran. A reference-station is connected to an eLoran antenna and tracks the eLoran signals and generates differential-corrections to overcome the ASF position inaccuracies: much like DGPS stations correct GPS signals. The differential eLoran corrections are only valid close to the reference station - each area (such as a harbour) where you want high-accuracy eLoran needs a separate reference station. However, a reference station is a relatively simple set up with only an eLoran receiver and antenna plus PC with an internet connection required.



Differential eLoran reference stations have started to be rolled out in the UK and seven such stations will be installed along the South and East coast to cover some of the major ports in this area as well as the Dover Straits which is one of the busiest shipping regions in the world.

12

DBDD PROJECTS

FEATURE

As mentioned in previous issues, the Dublin Bay Digital Diamond (DBDD) is an e-Navigation demonstrator project for the Dublin Bay area, the purpose of which is to provide an opportunity for users across the maritime sector to explore the potential of e-Navigation Services.

As part of our Dublin Bay Digital Diamond demonstrator initiative, CIL, along with our technical advisory committee members have identified several small projects for this demonstrator. Here are some of the projects that are currently live and released.



The DBDD e-Navigation demonstrator is entering its second phase. Improved communications is the key to e-Navigation and all nodes of the Dublin Bay Wi- Fi have now been installed and Wi-Fi range and overlap were tested using the Dublin Port pilot boat. It is planned to conduct more detailed overlap and coverage tests in the coming months.

The Dublin Bay Buoy continues to Tweet Wind Speed and Direction, wave Height, period and water temperature @DublinBayBuoy. A Dublin College University Water Quality Sonde is soon to be fitted to the Dublin Bay Buoy following Lab testing, interface with DBDD Wi-Fi and software being written for decoding data back to CIL.

The Technical Advisory Committee, made up of representatives from across the maritime and technology sector, the purpose of which is to explore the potential of e-Navigation Services has met for the third time in order to progress with the objectives of the demonstrator.

SMS to Agent

This project is currently on trial with Burkes Shipping who operate as agents for various ships coming in and out of Dublin Port. The system sends a text message when a ship enters a given area, alerting the Burkes Shipping agent, the agent then heads towards the ships intended berth. By monitoring AIS messages one, two and three's we can determine if a ship has entered / exited a given area. The purpose of this service is to cut down on the amount of time consummed updating revelant parties prior to arrival in port, moving to automated check-ins.

By using SMS, we are providing the end users with a chunk of information/data in an easily read format. SMS can also be processed on smart phones and text based screens.

Current applications can be expanded to include alerts for either MetOcean, ship movements and any other AIS monitoring properties.

Also providing on demand services like text "DBDD" to get the latest MetOcean reading from the Dublin Bay Buoy.

Kish Webcam

A WebCam is broadcasting live footage from the Kish lighthouse. CIL have overlayed live data transmitted from the Dublin Bay Buoy onto the video footage. This gives users a real-time view of conditions out in Dublin BayThe camera located on the Kish Lighthouse is a Y-cam Bullet IP based security camera. It takes 30 frames per second and is displayed with a resolution of 640x480. Video is streamed via a Wi-Fi link to our headquarters in Dun Laoghaire (14 km distance between the 2 locations). The camera is located inside the lighthouse (on the floor below the Optic) and pointing northwards. Ferries sailing between Dublin and Holyhead / Liverpool can be seen passing throughout the day and on a clear day, Lambay island can be made out in the distance.

6

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< CIL Dublin Bay Alerts



- Dublin Bay Alerts -Ship Approaching: Vega Stockholm MMSI: <u>636090978</u>

Heading:95 Time: 14/11/2014 08:16:37 All data in this SMS is to be taken AS IS

08:20, Fri via SMS

- Dublin Bay Alerts -Ship Approaching: Katharina B MMSI: <u>304304000</u> Heading:344 Time: 18/11/2014 07:52:26 All data in this SMS is to be taken AS IS

