

Agenda item 9 – TECHNICAL ACTIVITIES**9.4 e-NAV****9.4.3 Documents for discussion*****9.4.3-1 Discussion paper on test beds*****Note by the e-NAV Committee****1 INTRODUCTION**

This information paper serves as a discussion paper on e-Navigation testbeds.

2 BACKGROUND

The 58th session of the IMO Sub-Committee on Safety of Navigation (NAV 58, WP 6 Rev. 1 refers) agreed to the further development of guidelines for the harmonization of testbeds. Additionally, the e-Navigation Underway 2013 Conference (January 2013) identified a need for a body to co-ordinate the harmonisation of testbed results. The conference concluded that IALA could consider taking on this role and submit its results to IMO.

3 e-NAVIGATION TESTBEDS

The term testbed is used across many disciplines to describe a platform that is used for research, development or testing. Such a platform can be protected from a live (or production) environment. However, in the maritime domain, it is often necessary to conduct live tests with appropriate safety precautions in place.

In the context of e-Navigation, a testbed is used to demonstrate/evaluate a proof of concept of one or more of the e-Navigation solutions, systems and services. These testbeds may be established in a live or simulated test environment.

4 DISCUSSION

It is evident that a number of testbeds¹ are currently established. Furthermore, significant information on testbeds exists outside IALA. Noting this and the IMO requirement above, it is necessary to harmonise the testing of e-Navigation solutions, systems and services.

As at present, guidelines for the establishment of testbeds in the maritime domain are lacking, the e-NAV Committee considers it important that guidelines on testbeds be developed.

5 PURPOSE, SCOPE AND OBJECTIVE

The purpose of testbeds is to evaluate potential solutions in a live or simulated test environment.

¹ Testbeds known include MONALISA, ACCSEAS and the Marine Electronic Highway (MEH) in the Straits of Malacca and Singapore.

Collectively, the scope of testbeds for e-Navigation solutions can be broad and should preferably utilise existing and future technologies with the human element in focus. e-Navigation testbeds may comprise individual or a combination of potential solutions.

The objective of testbeds should be clearly defined with user needs in focus.

6 GUIDANCE ON TESTBEDS

The e-Navigation Committee will provide guidance on harmonisation of requirements and results of testbeds. This will include (but not be limited to) the following:

- identification of need for testbed;
- identification of similar testbeds (if any);
- planning of testbed;
- establishment of testbed;
- developing of test methodology;
- conduct of trials and tests;
- analysis and validation of test results;
- reporting in a harmonised manner.

6.1 Detailed considerations

In addition to the above, IALA will take the following considerations into account when developing its guidance.

6.1.1 Planning of testbeds

When planning testbeds, e-navigation applications selected should be linked to the established user requirements and aimed at the agreed objectives of e-navigation. Where possible, the applications should address identified gaps in the gap analysis.

6.1.2 Services and architecture

Testbeds should align with the IMO e-navigation architecture and the technical and operational services in the Maritime Service Portfolio.

6.1.3 User involvement

Testbeds should involve users at every stage and focus on user needs - from planning, through implementation, to assessment of results.

6.1.4 Usability

IMO guidance on usability and human centred design should be taken into account, together with system quality assurance.

6.1.5 Data Structures

Applications should (potentially) fit into the baseline data model agreed for the development of e-Navigation – the IHO S-100 framework.

6.1.6 Information

Information on testbed progress should be provided on a website that can be accessed by all interested parties. In particular, information should be provided to IALA to be posted on its e-navigation web portal (<http://www.e-navigation.net>).

6.1.7 Results

It is essential that tests meet an agreed standard that takes into account a structured, transparent, objective and repeatable methodology. Where the output is in the form of software tools, these may be open-source, with arrangements in place for collaboration, user feedback and improvement.

All results should pass quality assurance checks and should be made widely available.

6.2 Reference to the IMO Strategy Implementation Plan (SIP)

The details of the testbed, including the outcome and the lessons learnt (in the context of user needs, gap analysis and practical solutions of the strategy implementation plan) should be recorded.

6.3 Benefits of harmonisation

The following are some of the recognised benefits of harmonisation of testbeds:

- coherence of e-Navigation systems and services;
- promotes standardisation of Maritime Service Portfolios;
- single point of reference for testbed information;
- support for the evolution of e-Navigation;
- promoting international co-operation between stakeholders;
- contributes to the aims of e-Navigation;
- promotes economic efficiency by the sharing of resources;
- promotes the exchange of information and technologies.

6.4 Reporting and results

If possible, testbed reporting should be shared globally; and, to facilitate this, testbed reporting must be harmonised.

It is essential that tests meet an agreed standard that takes into account a structured, transparent, objective and repeatable methodology.

7 IALA's e-NAVIGATION TESTBED PORTAL

IALA, supported by the Danish Maritime Authority, has established an e-Navigation web portal (<http://www.e-navigation.net>). The site includes an area dedicated to testbeds.

The portal contains a list of testbeds that are complete, in progress or planned. While the portal is still under development it is intended to portray the information in a harmonised way and provide links to the testbeds own webpages.

8 ACTION REQUESTED

The IALA Council and all Committees are requested to note the information provided and provide any comments to the e-NAV Committee. Additionally, all IALA members are requested to forward any information on current and completed testbeds and any R&D projects to the e-NAV Committee.