Shanghai days – and nights

A look at the key issues presented at the XVIth IALA Conference, Aids to Navigation in a Digital World

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Introduction

The XVIth IALA Conference was held at the International Convention Centre, Shanghai, in the People's Republic of China, from 22nd to 27th May, 2006. Co-hosted by China Maritime Safety Administration (China MSA), the Conference was augmented by a workshop in Dalian on 29 and 30 May 2006.

Over 270 delegates, representing 44 countries (38 of which are IALA members) attended the Conference. The theme of the Conference was Aids to Navigation in a Digital World.

Digital aids to navigation

Developing the optimum mix of aids to navigation

A recurring theme at the conference was the quest by authorities to identify and provide the optimum mix of aids to navigation. Developments in technology for ships and shore infrastructure, the increasing use of risk assessment and management, as well as continuing emphasis on environmental protection, has underlined the need to review and reassess the provision of aids to navigation.

But how can the best use of aids to navigation, including short range, terrestrial and satellite aids to navigation be identified for any given waterway? Standards and regulations set by authorities can provide guidance, but the actual provision is not often measured until the services are actually in place. It was noted that there is a need to review how aids to navigation are provided, taking into account present (and future) needs, rather than historical or perceived needs. In addition, the provision of aids to navigation must reflect the needs of all user groups, requiring full consultation and transparency in the process.

Throughout the conference, a number of trends influencing the provision of aids to navigation were noted. They were:

• Navigation accuracy requirements
• Vessel size/speed
• Waterway use, noting the increased numbers of pleasure craft
• Technological advances in navigational aids, display options, information exchange, etc.
• Stringent standard requirements
• Multi-modal approaches to service provision

Risk assessment

With contemporary risk management techniques, the provision of aids to navigation can be tailored to meet the needs of stakeholders. This can aid risk reduction, ensure efficiency and safety of navigation and protection of the environment. With a session devoted to risk management, the conference provided delegates with insights into the latest developments.

The IALA Risk Management Tool uses both qualitative and quantitative assessments. This approach provides a comprehensive set of options to mitigate risk, and indicates the effectiveness of chosen actions. The model draws on the opinion of experts and the use of a comprehensive computer programme.

The two unique, yet complimentary tools are based on programmes that have been developed and used by IALA members. The quantitative approach, using IWRAP, or IALA Waterway Risk Assessment Program is a software programme based on the work carried out by the Canadian Coast Guard and Dalhousie University, with additional input from experts in France, Denmark and the USA.

The qualitative process is PAWSA, or Port and Waterway Safety Assessment, developed by the USCG. A professionally facilitated workshop process is used to consult stakeholders using a structured process. This enables participation and ‘buy-in’ from all those involved. The two approaches work together to provide a very effective risk assessment, with practical approaches to mitigating the risks that can be implemented and supported by those using the waterway.

Simulation – not just for training!

Simulation has long been recognised as an effective tool for training. The XVIth IALA Conference noted that it can also provide valuable insights into the effectiveness of a given mix of aids to navigation. Throughout the conference, different approaches to the use of simulation were presented. Simulation can not only assist in ensuring that the requirements of users are being met, it can also provide a valuable tool in assessing risk and relating that risk to the services provided. Specific examples included the marking of wind farms in varying weather and light conditions, introduction of AIS on aids to navigation and the conspicuity of lights in built up areas.
The use of Geographic Information Systems, or GIS, for both planning and evaluation of aids to navigation was identified as an area deserving further development. The development of AIS provides an unprecedented opportunity for data collection and analysis, and the integration of a GIS into the analysis provides further insight into the waterway use, risk areas and possible means of mitigating risks.

In addition, Bayesian networks can be adapted and applied to aids to navigation, providing a further means of modeling complex situations with the inclusion of probabilistic data.

The digital era and information age
What is the function of a buoy? By looking at the very fundamentals of the provision of aids to navigation, the delegates at the conference were challenged to think outside the norm and identify present and future requirements for aids to navigation. It was stressed that the role of buoys has evolved to a point where they are no longer the primary aid to navigation, but provide a ‘cross-check’ tool. While noting that buoys are just as important today as in the past, it was concluded that they were used in a slightly different context. The challenge now is to recognise and respond to the new factors that are influencing shipping. The concept of the ‘intuitive’ approach to aids to navigation was presented, stressing the need for a clear and unambiguous system.

The options for aids to navigation service delivery today go far beyond the traditional concepts, including buoys, beacons, lights, racons, AIS, GNSS, DGNSS, etc. Many areas of change and development with the provision of aids to navigation were presented, including:

- Changing requirements on radars, and their effect on existing racons
- Options presented to mariners and shore authorities through the use of AIS (shipborne and non-shipborne)
- Concerns expressed regarding vulnerability of GNSS, and the emergence of e-Loran
- Information exchange process through developing VTS centres – regional, national and global

Once again, the provision of the optimum mix of aids to navigation to meet the needs of the users will drive further developments!

The Digital Fairway
What is being done to bring the risk assessment techniques and the ‘intuitive’ buoyage system together into a practical solution? Keeping with the theme of Aids to Navigation in a Digital World, the concept of the digital fairway was presented (by True Heading AB of Sweden).

The only constant is change, and the maritime industry is undergoing rapid change, with profound effects. The availability of software applications and data sources is providing new services for the mariner and the service providers in several areas. How close are we to the concept of the ‘Digital Fairway’? From the various presentations at the IALA Conference, the answer would be very close indeed! The tools are either available, or being developed, to fully integrate into a digital era, and shipping can only benefit from the results.

e-Navigation
e-Navigation worked its way into the very opening of the conference, with the keynote speech by the IMO Secretary-General, E. Mitropoulus setting the scene for further discussion:

“There is no doubt that we are now entering a crucial stage in the development of what has become known by the ‘catch-all’ designation of ‘e-navigation.’ Many of the building blocks are in place, but what is still in an embryonic state is the global strategic vision needed to ensure that the new generation of navigational tools, available to us now and in the near future, can be drawn together in a holistic and systematic manner or, in other words, into an all-embracing system. If we get this
right, we have the opportunity to secure not only a greater level of safety and accident prevention but, at the same time, deliver substantial operating efficiencies with consequent commercial benefits.”

IALA is responding to the developments through the creation of an e-navigation committee, which will meet for the first time from September 18-22, 2006 at IALA headquarters, in St Germain en Laye, France. To assist in the work, IALA has a working definition for the concept of e-navigation, which was brought forward many times during the conference by the speakers:

“e-Navigation is the collection, integration and display of maritime information onboard and ashore by electronic means to enhance berth-to-berth navigation and related services, safety and security at sea and protection of the marine environment”

The future...

With developments in such diverse areas as risk assessment, data exchange, information display and real-time data provision, aids to navigation are on the threshold of change. While the human factor remains the key element in all aspects of shipping, aids to navigation in a digital world can provide practical solutions to problems that have existed for decades.

However, when providing aids to navigation in a global sense, the concerns expressed over the ‘digital divide’ must remain at the forefront of developments. Provision of a service can only be beneficial if all can access that service, and apply the data, to enhance safety of passage. IALA is continuing to lead the maritime aids to navigation community to ensure the most effective, efficient and safe approach to waterway use possible.

The report of the XVIth IALA conference can provide more insight into the topics mentioned here, and a compressed version is available from the IALA website at www.iala-asim.org.

Mr Davidson, AMSA CEO, Mr Mitropoulos, IMO Secretary General and Mr Kruuse, IALA Secretary-General.

Mr Mahesh Alimchandani has recently joined IALA as its Technical Committee Manager. He is a Master Mariner (Class 1), and has served on ocean going merchant cargo vessels for over fourteen years.

He has a Master’s degree in Business Administration from the University of Canberra and is a Member of the Royal Institute of Navigation. Until recently, Mr. Alimchandani worked with the Australian Maritime Safety Authority and contributed to the development and implementation of policy relating to the safe navigation of ships in Australian waters. His focus was on new technologies such as AIS and ECDIS.

Mr. Alimchandani has been a member of the AIS and VTS Committees of IALA since 2001.

The International Association of Lighthouse Authorities (IALA) established in 1957, gathers together marine aids to navigation authorities, manufacturers and consultants from all parts of the world and offers them the opportunity to compare their experiences and achievements. IALA is encouraging its members to work together in a common effort to harmonise aids to navigation world-wide and to ensure that the movement of vessels are safe, expeditious and cost effective.