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WORK PROGRAMME

Development of an E-Navigation strategy

Submitted by Japan, Marshall Islands, the Netherlands, Norway, Singapore, the United Kingdom and the United States

	SUMMARY
Executive summary:	It is proposed to add a new item on E-Navigation to the work programme of the Sub-Committee on Safety of Navigation (NAV) and also to that on Radiocommunications and Search and Rescue (COMSAR). The aim should be to develop a strategic vision for the utilization of existing and new navigational tools, in particular electronic tools, in a holistic and systematic manner.
	E-Navigation would help reduce navigational accidents, errors and failures by developing standards for an accurate and cost effective system that would make a major contribution to the IMO's agenda of 'safe, secure and efficient shipping on clean oceans'.
Action to be taken:	Paragraph 22
Related documents:	None

Introduction

1   The common objective shared by all the Member States of IMO is a commitment to deliver 'safe, secure and efficient shipping on clean oceans'. The co-sponsors of this submission believe that IMO now has an opportunity to develop and map out a clear strategic vision for integrating and utilizing all the navigational technological tools at our disposal to secure a greater level of safety and incident prevention which will, at the same time, deliver substantial operating efficiencies with resulting commercial benefits, whilst also continuing to respect the freedom of navigation rights.

Scope of the proposal

2   The scope of this proposal is broad. The authors of this submission believe it is now appropriate that IMO develops a broad strategic vision for incorporating the use of new technologies in a structured way and ensuring that their use is compliant with the various electronic navigational and communication technologies and services that are already available.

The aim is to develop an overarching accurate, secure and cost-effective system with the potential to provide global coverage for vessels of all sizes.

3   Implementation of this new strategic vision might require modifications to working methods and navigational tools, such as charts, bridge display equipment, electronic aids to navigation, communications and shore infrastructure. At this stage, it is difficult to be precise about the full extent of the changes that might be necessary to fully deliver this vision. However, there might need to be changes to a number of regulatory instruments, including the appropriate chapters in the SOLAS Convention. This would therefore entail consideration of the various strands of this policy in the Sub-Committees on Safety of Navigation (NAV) and Radiocommunications and Search and Rescue (COMSAR). This proposal is not in any way intended to conflict with the clear principle, as confirmed in the SOLAS Convention, of the master's authority for the operational safety of the vessel, and in UNCLOS, of freedom of navigation rights.

Need or compelling need

4   There is a clear need to equip the master of a vessel and those responsible for the safety of shipping ashore with modern proven tools to make marine navigation and communications more reliable and thereby reduce errors - especially those with a potential for loss of life, injury, environmental damage and undue commercial costs. More substantial and widespread benefits for States, shipowners and seafarers can be expected to arise from the increased safety at sea which is the core objective of E-Navigation. According to the United Kingdom's Marine Accident Investigation Branch, navigational errors and failures have been a significant element in over half of the incidents meriting a full investigation in the last three years (to February 2005).

5   There are already a great many electronic navigational and communication technologies and services available or in development - such as Automatic Identification System (AIS), Electronic Chart Display and Information Systems (ECDIS), Integrated Bridge Systems/Integrated Navigation Systems (IBS/INS), Automatic Radar Plotting Aids (ARPA), radio navigation, Long Range Identification and Tracking (LRIT) systems, Vessel Traffic Services (VTS) and the Global Maritime Distress and Safety System (GMDSS) - which can provide the master and those ashore with the necessary information they require.

6   In addition to reducing navigational errors and failures, these technologies can deliver benefits in areas such as search and rescue, pollution incident response, security and the protection of critical marine resources, such as fishing grounds. They can also offer operational benefits by enabling the capture of advance information on cargo arrival and increased throughput capacity in congested ports, fairways, and waterways, or in poor visibility conditions.

7   However, if such technological advancement remains uncoordinated, there is a risk that the future development of the global shipping industry will be hampered through lack of standardization on board and on land, incompatibility between vessels, and an increased and unnecessary level of complexity.

8   By taking a pro-active lead through the development of a strategic vision, IMO also has the opportunity to contribute to improvements in the international organizational structure overseeing marine navigation, improve international co-operation and give guidance to other organizations involved, such as the IHO and IALA and key stakeholders such as equipment designers, suppliers, navigation practitioners, shipowners and the port industry.

9   Furthermore, the strategy has the potential to contribute positively to the reduction of the burden on all countries, including developing countries, in having to maintain physical aids to navigation. It should also assist separate initiatives such as those currently under consideration in the Facilitation (FAL) Committee e.g. the development of electronic means for the clearance of ships and the submission of information to a single point (the 'Single Window' concept), which are aimed at reducing the range of reporting obligations on the ship-owner and ship master.

An integrated E-navigation action plan

10   The co-sponsors of this submission believe that the time is right to develop a coherent E-Navigation policy to embrace the ever-growing and complex set of technological aids which already exist. Delivery of this vision requires a clear, global commitment, articulated through a viable and coherent framework which sets out a migration plan (from where we are to where we want to go) for Governments and industry to achieve a common and consistent format for the use of electronic technologies.

11   The challenge for IMO is to develop a framework which accommodates and builds on existing systems already furthering the concept of E-Navigation, such as the World Bank-funded Marine Electronic Highway project in the Malacca Straits and the European Union's projects: ATOMOS IV (Advanced Technology to Optimize Maritime Operational Safety - Intelligent Vessel) and MarNIS (Maritime Navigation and Information Services). The framework must deliver improved navigational safety for maritime Authorities, coastal States and the master of a vessel, without imposing unnecessary burdens on them.

Analysis of the issues involved

12   The key structural components of a safe and comprehensive E-Navigation policy are:

.1   accurate, comprehensive and up-to-date Electronic Navigational Charts ("ENC"s), covering the entire geographical area of a vessel's operation;

.2   accurate and reliable electronic positioning signals, with 'fail-safe' performance (probably provided through multiple redundancy, e.g. GPS, Galileo, differential transmitters, Loran C and defaulting receivers or onboard inertial navigation devices);

.3   provision of information on vessel route, course, manoeuvring parameters and other status items (hydrographic data, ship identification data, passenger details, cargo type, security status etc), in electronic format;

.4   transmission of positional and navigational information: ship-to-shore, shore-to-ship (e.g. by VTS, Coastguard centres, hydrographic offices) and ship-to-ship;

.5   accurate, clear, integrated, user friendly display of the above information onboard and ashore (e.g. using IBS or INS);

.6   information prioritization and alert capability in risk situations (collision, grounding etc), both onboard and ashore; and

.7 reliable transmission of distress alerts and maritime safety information with reduction of current GMDSS requirements by utilizing newly emerged communication technologies.

Issues to be considered

13 Contemporary technologies already provide the capability to deliver much of the envisaged E-Navigation strategy. The co-sponsors of this document propose that the MSC, and its subsidiary bodies, should focus on creating the right environment to realize the full potential of these navigational technologies. This new work programme item will also need to tackle a wide range of issues (extending beyond what is already being done at IMO), including:

.1 increasing the production, coverage and interfaces of ENCs; as well as accelerating the distribution and promotion of commercially viable and globally accepted protocols for ENC production and updating;

.2 agreeing standardized controls and common performance standards of bridge E-Navigation systems (including the consideration of such issues as what information needs to be captured, how it should be displayed, how it should be laid out and what should be shared with other vessels and shore-based navigation support centres);

.3 agreeing protocols to provide more information to professional and authorized users, whilst preventing unauthorized access to, dissemination of, or intervention in safety or security-critical, real-time data transmissions;

.4 developing a shared understanding of the potential benefits and mechanics of shore support and oversight, leading to the design and implementation of shore-based marine E-Navigation support centres covering coastal and, potentially, international waters; and

.5 setting out an orderly and safe migration plan for E-Navigation which takes into account the future role of existing navigational tools, in different locations and situations.

Priority and target completion date

14 This should be deemed a high priority item, as the co-sponsors firmly believe that paragraphs 2.11.1 and 2.11.2 of the Guidelines on the Organization and Method of Work of the Committees and their subsidiary bodies (MSC/Circ.1099) are relevant to this proposal.

15 It is envisaged that this proposal should be referred to the next sessions of the NAV Sub-Committee (NAV 52) for initial consideration. It is further proposed that the issue should also be considered by the subsequent meeting of the COMSAR Sub-Committee (COMSAR 11), to discuss any communications-related issues. However, the consideration of the issue by this Sub-Committee would be under the co-ordination of the NAV Sub-Committee. The Sub-Committees should be requested to consider the issues with the aim of developing a strategic vision with an associated work programme for taking this issue forward and report back to the Maritime Safety Committee as soon as possible, and at the latest, by its eighty-fifth session at the end of 2008.

Is the subject of the proposal within the scope of IMO's objectives?

16   Yes. The Strategic Plan for the Organization (for the six-year period 2006 to 2011) (resolution A.970(24)) specifically identifies (in paragraph 2.9) as a challenge for IMO the aim of ensuring that:

> *".1   ...the technological developments adopted are conducive to enhancing maritime safety, security and the protection of the environment;"*

and

> *".2   ...the proper application of information technology within the Organization and to provide enhanced access to that information for shipping, for the shipping industry and others."*

The Strategic Plan also states at paragraph 3.3.2 that:

IMO will take the lead in enhancing the quality of shipping by:

> *".1   encouraging the utilization of the best available techniques not entailing excessive costs, in all aspects of shipping;"*

and

> *".3   promoting and enhancing the availability of, and access to, information – including casualty information – relating to ship safety and security (i.e. transparency);"*

Do adequate industry standards exist?

17   No. Considerable work has been carried out by numerous organizations, including IMO, IHO and IALA that have led to the development of standards for individual electronic navigational technologies, such as AIS, ECDIS etc. However, no single institution has taken the lead in developing a comprehensive vision for E-Navigation, managing buy-in from the various key stakeholders in such a way as to promote its constructive development and standardization.

18   IMO is the appropriate, and indeed the only international body, capable of managing a programme with these objectives and of this scope and magnitude. However, the involvement of other bodies, such as IHO, IALA, IEC and ITU will be needed to help realize some essential components.

Do the benefits justify this proposed action?

19   Considerable sums of money are expended by shipowners and operators, on top of the substantial resources deployed by flag, port and coastal State regulators, in seeking to make marine navigation easier and to reduce navigational errors and failures. The E-Navigation strategy would enable the industry to benefit from reducing these costs in the long-term. The co-sponsors of this submission are convinced that if action is not taken soon, the disadvantages of pursuing uncoordinated individual technologies will outweigh the potential benefits that together they could deliver. Focussing resources on the co-ordination of improvements to navigational and communication tools will bring substantial overall safety, security, environmental protection and commercial benefits.

20   Full analysis of costs will be needed, if and where these occur over and above those that have already been considered by IMO for the range of existing required navigational and communication systems. The co-sponsors recognize that any such new costs may include those related to the administrative burden on contracting States as a consequence of any changes to current national regulations that may be necessary.

21   Coastal and port States incur substantial expenditure in providing physical aids to navigation, whether funded by the public purse or met by the shipowner through dues levied on port traffic. Although a great deal has been done by coastal and port States in reducing such costs - by automation, by the application of low-maintenance equipment and by the use of renewable energy sources - there will be continued upwards pressure on the cost of servicing aids to navigation networks, given the dependence on skilled labour and fuel. For developing countries especially, the establishment costs for physical aids to navigation or the costs to affect a transfer to the use of renewable energy sources or increased automation can be considerable. A comprehensive and integrated E-Navigation strategy would provide the opportunity for reducing overall costs whilst fully meeting obligations for the safety of navigation.

Action requested of the Committee

22   The Committee is invited to note the information provided above and agree to include a new item on the work programmes of the Sub-Committees on Safety of Navigation (NAV) and Radiocommunications and Search and Rescue (COMSAR) on the 'Development of an E-Navigation strategy' as proposed in paragraph 15 above.

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