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ANY OTHER BUSINESS

**Impact of new and advancing technologies to maritime transport
and the regulatory framework**

**Submitted by Denmark, Estonia, Finland, Japan, Norway,
Singapore, Sweden and IMarEST**

SUMMARY	
Executive summary:	This document provides information on future possibilities for developments in the automation of ships, digitalization and the use of information technology
Strategic direction:	5.2
High-level action:	5.2.1
Output:	No related provisions
Action to be taken:	Paragraph 15
Related documents:	None

Introduction

1   One of IMO's objectives according to the Strategic Plan is to "provide an effective and efficient response to shipping trends, developments and incidents and, in so doing, stave off regional or unilateral tendencies that conflict with the Organization's regulatory framework". To achieve this, IMO will need to proactively identify, analyse and address emerging issues, thus maintaining its role as the global regulator of international shipping.

2   The future challenge for IMO would be to integrate new and advancing technologies in its regulatory framework enabling technology development globally, thus avoiding various national and/or regional solutions that may hamper shipping or having a stifling effect on the development of new technologies.

CONNECTING SHIPS,
PORTS AND PEOPLE

Discussion

3   When the industry introduces new concepts and solutions, the Administrations are responsible to assess under which conditions such trials or solutions can be safely and securely tested, with minimum impact on the maritime safety, security and the marine environment. Administrations also have an important role in encouraging innovation that would benefit the maritime transport.

4   There are several arguments that support better utilization of new technology. For the industry, ship efficiency is the principal driver for the future as it directly impacts operating costs. Advancing technologies have brought about changes, and new opportunities, like software tools to optimize the ship's performance and remote access for service and maintenance of onboard machinery and equipment. Existing technology provides new possibilities for developing intelligent automation concepts, allowing for advanced digital control on ships.

5   Improved and new technologies, i.e. e-navigation, have given the maritime industry the opportunity to enhance safety, security, efficiency and reduce the environmental footprint on existing ships. There are many ways to improve efficiency; for example, by optimizing the ship's design, improving the hull form, developing systems to optimize ships' performance and reduce fuel consumption and optimizing the transport chain.

6   The oncoming reporting requirements vis-à-vis the IMO Data Collection System will require information on energy efficiency of ships to be collected and reported. In order to meet the global sulphur cap and emission control requirements, new monitoring and enforcement methods, such as satellite monitoring are needed, which would ensure that data collection systems are cost effective, efficient and reliable without introducing additional maintenance on man-time requirements to vessels personnel.

7   The IoT (Internet of Things) will allow the elements (ships equipment, sensors, machinery, cargo data, etc.) that are interfaced to exchange relevant information to stakeholders. This will allow ships to automatically transfer information requested by authorities without causing administrative burden to the crew on board. Through the IoT, the processing and collection of data, which in many instances is conducted manually, may be significantly reduced.

8   New information technologies are changing traditional shipping management as well as time and material based maintenance, into a condition-based monitoring and maintenance system. Condition-based monitoring and maintenance systems would optimize the energy efficiency of the voyage and reduce the life cycle maintenance costs for the equipment. The proliferation of sensors and data in real time will allow understanding the way in which the ship and equipment is being operated and the way that it's performing. In turn, it facilitates the possibility to take optimized decisions on operation and to maintenance i.e. whether to do maintenance early to prevent a failure, or to delay maintenance because the equipment has not been used as extensively as it was designed for.

9   Big data, delivered in a meaningful and user-friendly format, may provide solutions in the areas of optimization and decision support, as well as remote and autonomous operation. Research and development on the utilization of big data, collection and analysis of data, information and communication technology, allowing further automation or even autonomous operation in the maritime domain have taken place at a remarkable pace. Managing high levels of data in order to operate on-board systems will be a big part of that reality.

10   Erroneous human behavior has been identified as one of the prime factors causing or contributing to the incident in emergency situations and maritime accidents. Automation at all levels, will further minimize the risk of errors and thus reduce the number of incidents, casualties and maritime accidents. As such, autonomous ships would potentially lead to fewer accidents. Improved safety performance is also a commercial benefit.

11   The industry, technology providers, designers, shipyards and shipowners are cooperating in the area of new technologies to meet the new requirements on higher standards of safety and eco efficiency in shipping. They have already catered for many development projects around the globe. Some projects focus on information sharing environment and architecture, others on automation and remote controlled or autonomous ships.

12   Highly automated ships are being tested, covering also unmanned ships at sea. Smaller autonomous ships in national trade will be introduced in the near future, whereas autonomous ships in international trade are expected in the longer term.

Conclusion

13   Taking into account the discussion above, the co-sponsors find it important that IMO pro-actively collect information to fully evaluate and understand the developments and progress made in the field of new technologies. This would enable IMO to make evidence based decisions with regard to possible future regulatory work in a timely manner.

Proposal

14   The co-sponsors invite all the interested IMO Member States and organizations to submit information on studies, including technical, legal, operational, training and maintenance aspects of autonomous shipping, information on ongoing research, testing and full-scale projects to future sessions of the Committee.

Action requested of the Committee

15   The Committee is invited to consider the information above and to urge Member States and organizations to submit any information (paragraph 14).

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