IALA

CURRENT
DRIVERS AND TRENDS
2018

DOCUMENT HISTORY

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CONTENTS

1. TRENDS AND DRIVERS OF STRATEGY FOR THE PERIOD 2018-2026

Numerous trends and factors affect the work of IALA members and the direction that the organization should focus its attention. These can be summarized into Trends and Drivers.

The Drivers are derived from the Trends, and are a useful way of summarising a multitude of factors. IALA considers that four Drivers need to be considered in order to determine Strategy. These are:

- Volume of traffic and degree of risk
- Environment and sustainability
- Efficiency and safety
- New technology

Below the origin of these Drivers are explained. Trends are discussed and then a diagram draws these together into a Driver, with a diagram to illustrate.

1.1. Driver 1, Volume of traffic and degree of risk

There have been substantial changes in global shipping, including an increase in the volume of vessel traffic and the size of vessels, an increasing dependence on an interconnected global economy, and the rapid development and availability of modern information technology. In addition, there has been an increasing public demand for improved surveillance and management of vessel traffic. This is coupled with a developing expectation to prevent shipping related incidents along with a need to respond effectively to emergencies in all navigable waters, especially in port and coastal areas.

These increasing requirements have been imposed upon coastal and port infrastructures, as well as on the interaction between ships and shore authorities and stakeholders. New technologies have provided the opportunity for efficient and effective information exchange and re-use of the collected data by participants and stakeholders in the maritime environment.

Shipping rates are presently low with larger ships and corporate mergers increasingly frequent as shipping companies strive to remain competitive. Despite this the world SOLAS fleet continues to grow. Globalisation including the associated manufacturing and assembly practices increases the international flow of components and completed goods.

Developments to control vessels from the shore are well advanced. Small autonomous vessels have been in use for many years, for example for survey and data gathering, but they generally do not require (conventional) marine aids to navigation. It is likely that autonomous vessels will require new Marine Aids to Navigation support and this needs to be carefully considered to assure a harmonised delivery. Unmanned or autonomous ships are being developed in a number of countries, with some already at sea. As commercial shipping enters this new era, we can expect a change in the electronic services which members may be required to provide. The manner in which these ships interact with other vessels and with shore services and authorities such as Vessel Traffic Services (VTS) which will be required for these ships are matters for great consideration.

Fishing vessels, pleasure craft, and smaller ships that do not fall under the provisions of the IMO SOLAS Convention are far more numerous than SOLAS ships. In many countries the non-SOLAS vessels account for more accidents and emergencies than SOLAS vessels. Depending on the type of vessel, their equipment fit may vary from very basic, to systems of the highest sophistication. The SOLAS convention requires contracting governments to provide *such aids to navigation as the volume of traffic justifies and the degree of risk requires,* this applies also to Vessel Traffic Services. This is irrespective of vessel type. Some National Authorities have traditionally concentrated their attention on commercial shipping navigating in their nation's waters and using their ports. The need to provide better and modern shore services to non-SOLAS vessels is an increasing consideration.

The IMO has recognised a trend towards a reduction in the skills of bridge teams. This may drive an increase in reliance on decision support tools as well as a higher demand for assistance from ashore.

The volume of traffic and the desire by coastal authorities to reduce risk has contributed to an increase in numbers of VTS authorities being established.

The compulsory fitting of AIS to SOLAS ships, and its voluntary uptake by other vessels, originally for safety of navigation, has enabled shore authorities to build up a picture of shipping density, and preferred routes, assisting the computation of risk and the design of marine aids to navigation systems. AIS has revolutionised VTS with information on vessel details and course, speed, and rate of turn all available on the VTS display. AIS receivers on satellites have extended knowledge of tracks to areas outside terrestrial VHF range. VHF Data Exchange System (VDES) will make this tracking capability more competent.

In some nations, the institutions for managing marine aids to navigation services including VTS require further development. Legislation or regulations may not be in place, or staff may not be aware of the country's responsibility under international laws and conventions.

At the same time, the job of VTS operators has changed from mostly radar observation tasks to interacting with vessels in ever increasing complex traffic patterns. It is now a proactive service. The number of ships in a VTS area has often increased but the main change is the increasing size of ships. In a VTS area with narrow navigable waters and a lot of channel bends, where inland shipping mix with seagoing vessels constrained by length or draft, there is a huge impact on operational VTS procedures. Not only the length and width of the constrained vessels have to be taken into account, but more importantly their under-keel clearance must be taken into account. More advanced operational solutions are needed such as improved measures for effective slot management.

A future consequence of the evolution of VTS is the focus increasingly being placed on ensuring the general efficiency of vessel traffic from both safety and commercial perspectives. VTS is increasingly being utilised as a means to optimise the flow of vessel traffic to provide benefits to ship operators and ports ranging from enhancing fuel efficiency to managing vessel traffic to facilitate optimal berthing windows and minimising time alongside.

The global harmonisation of VTS procedures has not yet been achieved but it is a key objective of IALA's work.
The need for correct and complete training of marine aids to navigation and VTS personnel is now becoming universally recognised. Some national members are establishing dedicated training institutions, and offering their services to neighbouring countries also. At the same time, the availability of skilled technicians that are required to maintain a VTS infrastructure are reducing, especially in developed countries as cost pressures drive outsourcing and staff reductions.
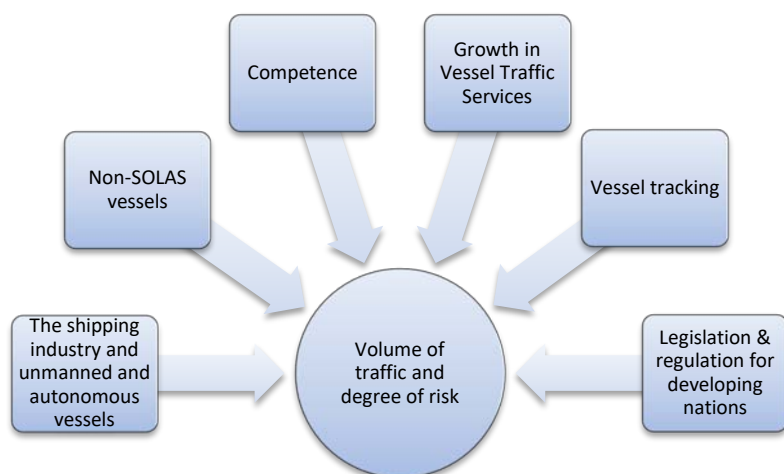
1.2. Driver 2, Environment and sustainability

The reduction in sea ice in the Arctic has led to a great interest in polar routes between the continents. At present, the increase in polar traffic for commercial purpose has been small, but this may change in the future. Provision of visual aids and of electronic services including Virtual AtoN in Polar Regions is difficult. We can expect that area radionavigation systems and electronic dissemination of information will be important, but may be limited by the costs and difficulties of installation and of access for maintenance.

Globally pressure has been increasing on the sea space available for navigation, as demands for offshore energy production (oil, gas, electricity) increase, and as exploration and exploitation of the sea and sea floor grow. The effect in some sea areas is to confine conventional ship navigation and fishing to more constrained spaces. Marking of offshore activities by conventional and electronic means, to make all classes of vessel aware, is an ongoing task. Further harmonisation is increasingly important here, both with light signals and electronic information, to avoid misinterpretation and thus accidents.

Marine aids to navigation services are generally required in order to observe best practice for preventing pollution of the seas, for preserving the beauty of littoral regions, and for avoiding harm to certain sea creatures. This is resulting in restrictions on the use of certain materials, in changes of operational practices, and in increased workload in planning and operations.
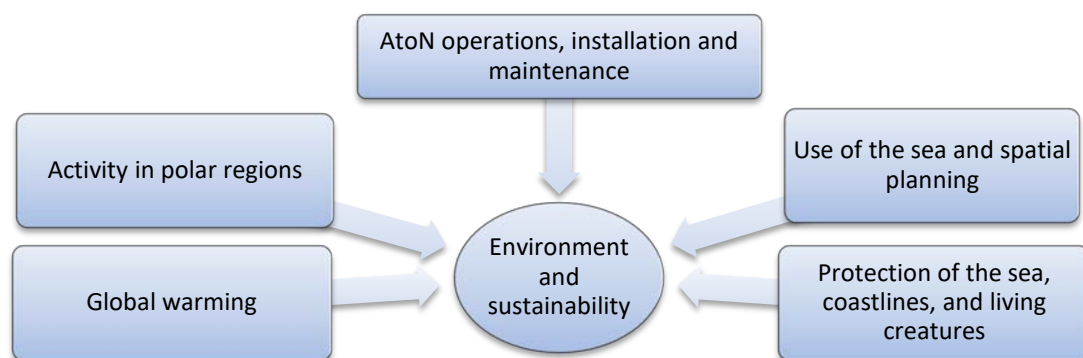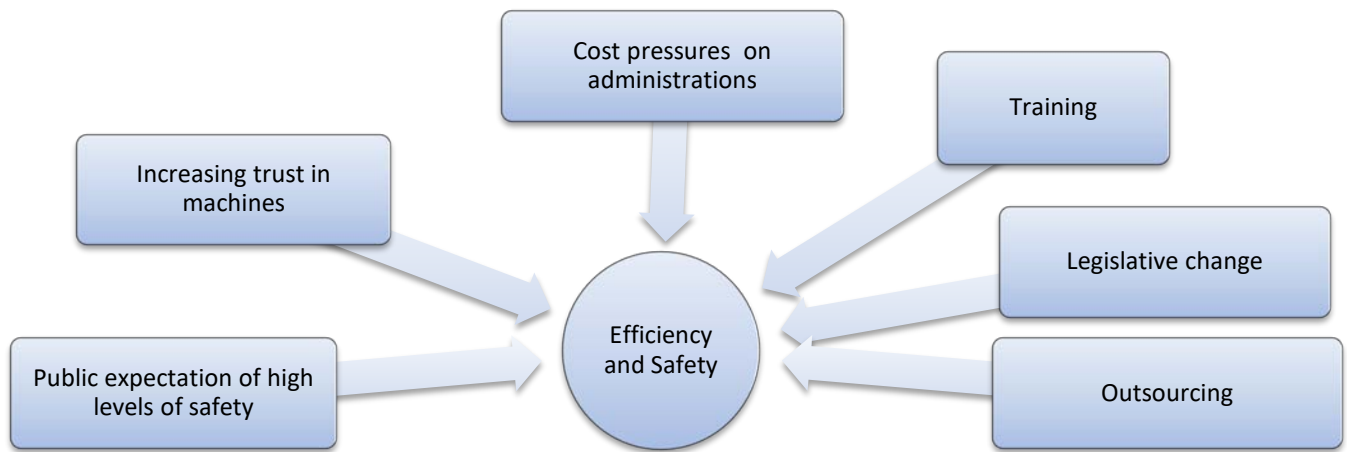

1.3. Driver 3, Efficiency and safety

The public has an expectation that commercial shipping, particularly the cruise industry, is managed and conducted in a safe manner. Accidents and pollution incidents, especially near shore, receive heavy attention in the media. There is also probably an impression among parts of the public that shipping traffic is monitored and controlled in a manner similar to commercial aviation.

Accident reports for all transport modes show human error as a primary factor. Automated vehicles, on rails, on roads, and in the air are accepted by the public and generally trusted to be safe and reliable. The development of personal technology and communications and the almost universal use of GNSS for all transport modes have created an impression that high technology and precise vehicle control should apply to navigation at sea also.

The pressure on most governments to contain their operating expenses coupled with a technology focus is leading to a reduction in focus on traditional delivery methods for marine aids to navigation services. Outsourcing of activities in many service areas by governments means that for marine aids to navigation services the knowledge and competences of the services are lost and replaced by contract and performance monitoring. This then requires a new skill set in the authorities to compensate for this loss.

Cost pressures on administrations

Training

Increasing trust in machines

Legislative change

Efficiency and Safety

Public expectation of high levels of safety

Outsourcing

1.4. Driver 4, New Technology

In contrast with the aviation industry, a provider of shore services for vessels at sea must remain aware of the wide range of capability that may be found on the bridges of vessels. This is a long-standing problem, but may be assuaged gradually by IALA's work towards harmonisation of electronic shore service provided to shipping by its members, driving bridge hardware and software gradually towards its own harmonisation. Cost pressures in the shipping industry means minimally equipped SOLAS bridges remaining in service.

GNSS systems are now (almost) universally used by all. With GPS, GLONASS, Galileo, and BeiDou in service or soon to be, GNSS services are increasingly resilient. However deliberate jamming of GNSS is easy to do, solar weather can disrupt GNSS services, and some man-made radiation can unintentionally upset GNSS position fixing. With this in mind and disruptions to communications and information for marine navigation by cyber-attacks back-up systems and cyber security are vital.

"e-Navigation" was proposed more than ten years ago, but has been slow to develop. The advent of AIS drove a leap forward, as did development in bridge electronics. The harmonisation and delivery of electronic services from shore described in "Maritime Services in the context of e-Navigation", will be vital to ongoing progress. Developments in connectivity and information flow between ship and shore will create opportunities to increase port efficiency through VTS. Cyber security concerns will need to be addressed.

Despite these advances, mariners still require the visual cues provided by traditional visual signals from light-beacons, buoys and day-marks to provide hazard marking and spatial awareness. These require only the human eye and the mariner's skill to use. With these types of aids, delivery of service is consistent between all categories of ships and all categories of users. We can expect them to be in service for the foreseeable future.

Current systems, including GNSS and AIS, can be disrupted by malignant action. Future communications and information services for marine navigation must be cyber secure.

Allocation of frequency bands for radio transmissions are governed by the regulations of the ITU. The provision of frequency allocations sufficient for digital information flow between ship and shore is vital for safety and efficiency.

The modernisation of GMDSS is a current task in IMO. The IALA concept of VDES is for the broadcast of maritime safety and other information, and for AIS vessel identification and tracking, but may have the capability to form part of a new GMDSS.

While not currently recognised as a formal maritime safety communication method, the near-ubiquity of cellular phone aboard all classes of vessel, may provide a near-coastline communication system of good performance. The

use of cellular phone systems for delivering shore services will become increasingly important, especially for non-SOLAS craft and for emergencies.

Decision support software for bridge crews and for VTS personnel are expected to become increasingly used.
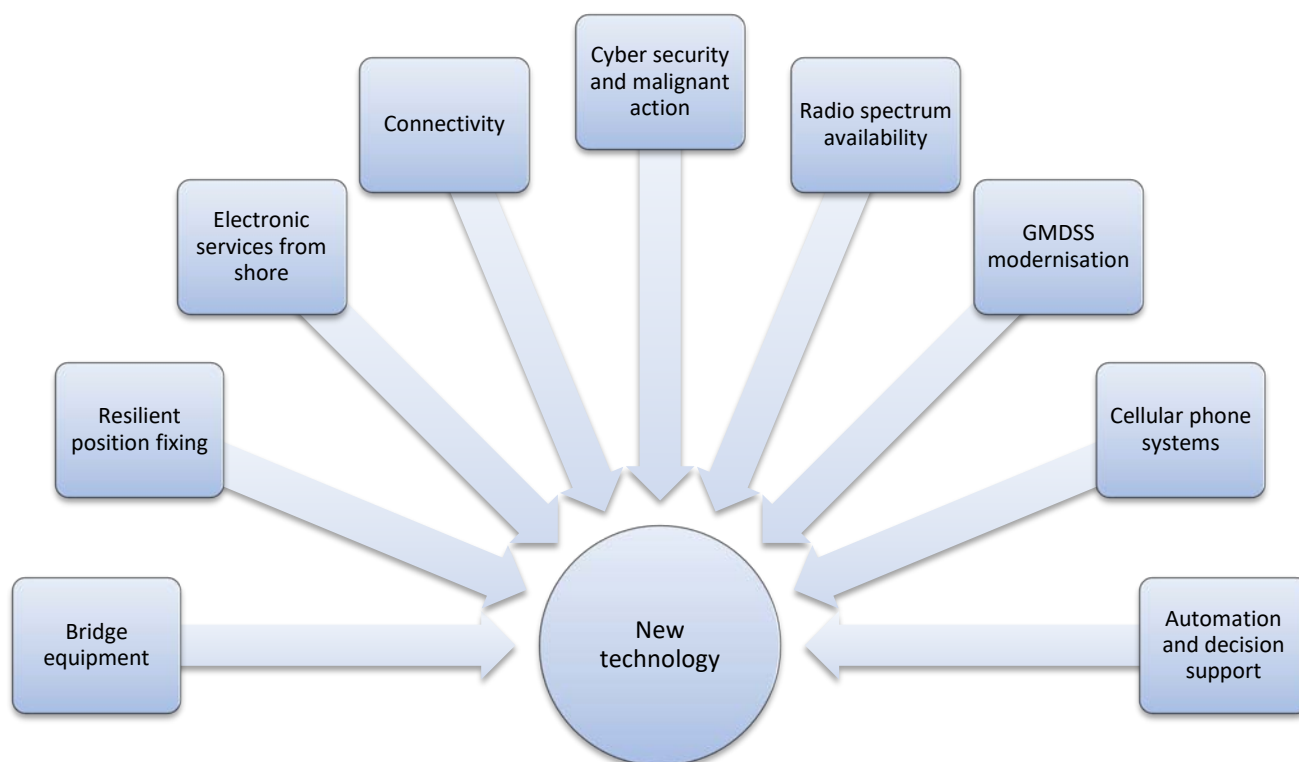
2. STRATEGIES FOR 2018-2026

S1 - Develop standards suitable for direct citation by States, in areas deemed important by the General Assembly, and the related Recommendations and Guidelines.

S2 - Position IALA as the source of standards, knowledge, and expertise that will enable States to provide marine aids to navigation, in accordance with relevant international obligations and recommendations.

S3 - Coordinate the further development of marine aids to navigation, taking into account new technologies and sustainability.

S4 - Continue to develop capacity building activities to improve the global provision of marine aids to navigation.

S5 - Harmonise the information structure, Maritime Service Portfolios, and communications for e-Navigation by creating standards, and by cooperation with other international organisations, to achieve worldwide interoperability of shore and ship systems, including IMO sustainability goals for a maritime transport system.

S6 - Improve and harmonise the delivery of VTS globally and in a manner consistent with international conventions, national legislation and public expectations, to ensure the safety and efficiency of vessel traffic and to protect the environment.

S7 - Work towards the transformation of IALA into an IGO, to enable the organization to achieve its aim objectives.

S8 - Ensure that the resources and capabilities of the Secretariat are sufficient to enable IALA and its committees and organs to reach its goals.

3. THE STRATEGIC VISION

The original Strategic Vision for IALA was developed in 2013 to cover the period 2014-2026.The Strategic Vision for 2018-2026 was approved by the Council meeting in its 65th Session at IALA HQ in December 2017, and approved by the IALA General Assembly on 29 May 2018. . Its content is as follows.

- Purpose
- Motto
- Goals
- Strategies

The Purpose of the organisation is its reason to exist, its Goals are those it hopes to achieve in the medium to longer term, the Trends are external factors which create Drivers which influence the decisions on Strategies.

Purpose	Goals	Trends	Drivers	Strategies

The following diagram overleaf will explain further.

Strategic Vision

Purpose of the Organisation

| Defined by the Constitution | Unchanging |

↓

Goals

| Derived from the Purpose | Longer term, 12 years or more |

↓

Strategies

| For achieving the Goals, recognising the impact of the Drivers | Medium term, 4 to 12 years |

Position on Marine AtoN Development

Trends

| Factors affecting the organisation and its members | May vary quickly or slowly |

↓

Drivers

| Influences on strategic decisions |

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Priorities and pathways

Tactical positions and work priorities

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Advisory Groups
Committee Structure
Work Programmes