E-Navigation underway 2019
North America
Aids to Navigation
IALA Constitution Art. 1

“A device, system or service, external to vessels, designed and operated to enhance safe and efficient navigation of individual vessels and/or vessel traffic"
IALA Strategic Vision and Goals for 2026

Goal 1
Marine Aids to Navigation are **developed** and **harmonized** through international cooperation and the **provision of standards**.

Goal 2
All coastal states have contributed to a sustainable and efficient global network of Marine Aids to Navigation through capacity building and the sharing of expertise.
Developed and Harmonized
The Maritime Buoyage Agreement

IALA A and IALA B

During the IALA conference in November 1980 two navigation marking systems, i.e. the System A (red color for the left hand side of the ship) and the System B (red color for the right hand side of the ship), were combined into one - the IALA Maritime Buoyage System.
Publications
Main result of the Committees’ work

- **Standards** which can be referred to directly in IMO and other international conventions and in national maritime laws.

- **Recommendations** which advise what should be done.

- **Guidelines** which advise how to implement the recommendations as ‘best practice’.

- **Manuals** which provide general reference materials (NAVGUIDE; MBS; VTS Guide; IALA Dictionary).

- **Model courses** which provide guidance on the training of VTS personnel, Aids to Navigation Managers and Aids to Navigation Technicians.
The Committees

The “Power House” of IALA

- AtoN Requirements and Management (ARM)
- Engineering and Sustainability (ENG)
- Vessel Traffic Services (VTS)
- e-Navigation Information Services and Communications (ENAV)
Mind the Gab
The Maritime domain into the digital age
E-navigation is defined as “the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment.”
CHAPTER 2
GENERAL INFORMATION
MARINE CASUALTIES AND INCIDENTS

KEY FIGURES 2018

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<td>CASUALTIES &amp; INCIDENTS</td>
<td>VERY SERIOUS CASUALTIES</td>
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Damage to port side quarter of the general cargo CELTIC SPIRIT, which dragged its anchor in heavy weather and subsequently collided with two other vessels, also at anchor, causing shell plate damages, on 01/03/2018.
2017 was the safest year in aviation history
Investigators look for the root causes of the casualty or incident. Such causes are made up of ‘accident events’ and ‘contributing factors’. The reporting scheme used in EMCIP follows this approach. A detailed model of EMCIP can be found in Appendix 2.

2.5.1 ACCIDENT EVENTS

Figure 2.21: Distribution of accident events for 2011 - 2018

From a total of 4104 accident events analysed during the investigations, 65.8% were attributed to a human actions’ category and 20% to system/equipment failures.

A casualty event can have associated one or more accident events.
E-navigation is defined as “the harmonized collection, integration, exchange, presentation and analysis of marine information on board and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment.”
The IALA Council has identified the following trends and developments:

Increased Digitalization, including big data and future communication; Development of autonomous, automated and unmanned vessels; Need for increased connectivity and interoperability; Cyber-crime vulnerability and cyber security; Changes in trade patterns due to global economic developments; Large cruise ships going to remote locations like the Arctic; Competing use of the oceans (Marine Spatial Planning); and Demand for efficiency in the transport chain.
About so-called autonomous ships: "Pilots, and indeed most other people knowledgeable about ship operations, recognize that much of the expressed enthusiasm is unrealistic and generated by technology vendors and coastal government administrations rather than the ship operating community."
The Maritime “future”

• Shore services
• Data Modelling
• Resilient Position, Navigation and Timing (PNT)
• Connectivity
Five types of e-Nav “specifications/descriptions”

Maritime Service Descriptions

S-100, S-200 ... Data Product Specifications

Technical Service Specification

Technical Service Design Description

Technical Service Instance Description

IMO

IHO (S-100)
IALA (S-200)

IALA

IALA

IALA

Basic Principles
Technology Agnostic

What to do
(IALA Recommendations)

Technology Selection
How to do...
(IALA Guidelines)
(Blueprint)

Actual Implementation
(Sea Chart)
Five types of e-Navigation “specifications”

- **Maritime Service Descriptions**
  - IMO

- **S-100, S-200 ... Data Product Specifications**
  - IHO (S-100)
  - IALA (S-200)

- **Technical Service Specification**
  - IALA

- **Technical Service Design Description**
  - IALA

- **Technical Service Instance Description**
  - IALA G1128
I am Tony

I want to start my own business using e-Navigation principles
What type of business to select?

- Tug service?
- VTS service?
- AtoN service?

- Pizza service?
What type of product should I offer?

- Pizza Bolognese?
- Pizza Diavolo?
- Pepperoni Pizza (my mama’s recipe)
What is my Pizza service Concept? (technology agnostic)

- Orders by telecommunication
- Delivered to shipside
- Within 17 minutes
- Firmly packaged & still warm
What technology and design? (Blueprint)

- Stone furnace
- Cardboard packaged
- Delivered by Scooter
- Pay by credit card
- Domino’s look alike
I must advertise (Yellow Pages)

- Establish Identity
- Enable discovery
- Publish endpoints
- Conduct business
The Consumer perspective....

I want a pizza....

Maritime Service Descriptions
S-100, S-200 ... Data Product Specifications
Technical Service Specification
Technical Service Design Description
Technical Service Instance Description