The future of e-navigation

4th E-Navigation Underway Asia Pacific Conference
8 and 9 September, 2020

Nick Lemon
Manager, Systems Safety, AMSA
Outline

• e-navigation today – are we on track?

• how it is being implemented

• the future of e-navigation
E-navigation today

• E-navigation is now a clichéd, catch-all term, that is losing its impact.
• When the global community embarked on this ambitious project in 2006, the term was captivating …it was a noble three part definition:
  
  • “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.”
• IMO’s e-navigation Strategy Implementation Plan (SIP) was approved in November 2014 (updated 2018).

• It lists five e-navigation solutions:

1. improved, harmonized and user-friendly bridge design; ✗ ✓
2. means for standardized and automated reporting; ✗ ✓
3. improved reliability, resilience and integrity of bridge equipment and navigation information; ✗ ✓
4. integration and presentation of available information in graphical displays received via communication equipment; and ✗ ✓
5. improved Communication of VTS Service Portfolio (not limited to VTS stations). ✗ ✓

• It was expected these solutions would be achieved by 2019 and would deliver harmonized information, so products and services could be built to deliver these listed solutions.
Severe economic downturn. Heightened geo-political tensions.

The long-term impacts of the COVID-19 pandemic – uncertain

Shipping will remain the lifeblood of the global economy for the foreseeable future.

_Foresight is not about predicting the future, it is about minimising the surprise._
Climate change

More severe weather events – harm to personnel, damage to ships and infrastructure and delays

Technology

Digitalisation
Big data, block chain, etc
Automation

Environmentally responsible shipping – pressure to reduce emissions

✓ MARPOL – improved protections in response to rising community expectations
✓ Low sulphur fuel and alternative means of propulsion
✓ Emission Control Areas – ships’ routeing
✓ Port arrival systems & speed optimisation
✓ Energy efficient design
✓ Noise and wake pollution
Examples of how

- Maritime Connectivity Platform
  - Two known instances:
    - Asia Pan-Pacific Web
    - Navelink (a non-profit consortium, involving the majors of the marine electronics industry)
    - Need more instances – and global harmonisation

- Global and technology agnostic concepts for digital collaboration:
  - Port Collaborative Decision Making (PortCDM). Developed and validated within the MONALISA and STM Validation projects.
  - Port Call Optimisation.
  - Both provide situational awareness among actors to enhance the efficiency of port operations.
What of the future?

• A decade of transition for electronic navigational charts

• ECDIS or INS?

• The maturing of many S-100 based product specifications:
  • S-129 Under Keel Clearance Management
  • S-124 Maritime Safety Information
  • Port call optimisation S-241
  • Several others ….S-200 of IALA is ready for testing

• Learn from the problems experienced with the way ECDIS was introduced
Increasing use of connected systems on board, and ashore.

- Navigation, propulsion and cargo systems on board. Large cruise ships.
- Digital maritime services.
- Ashore - ports, containers, cargoes and VTS.
- Large, distributed and complex systems. More vulnerability.

Attacks - can range from collection of data and malicious activity to interference with ship operations.

Specific risk is difficult to predict.
• Trust in autonomous systems?
  Well designed systems, transparency and accuracy of outputs

• How to deal with boredom and fatigue?
  Get machines to do what machines are good at…

• Training operators for the age of automation

• Marine Autonomous Surface Ships
• Australia’s outlook for navigation services
Summary

• The ‘how’ and ‘why’ of e-navigation remain valid, but the ‘what’ is turning out differently – shapers and influencers

• Economically driven, supply chain related developments are happening

• Shaping influences from technology, climate change, COVID-19, cyber risks, role of automation, and

• Enabled by a decade of ECDIS transition
Thank you for your attention

Nick Lemon
Manager, Systems Safety, AMSA
Tel: + 61 2 6279 5656
E-mail: nsl@amsa.gov.au