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Hydrographic Office



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AECC | Aberdeen

# e-navigation: Do we need the IMO SIP?

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## ■ When did you last use Google Maps?

Aberdeen Airport, Dyce, Aberdeen AB21 7DU, Uni

Exhibition Ave, Bridge of Don, Aberdeen AB23, UK

Route options

- via A96 **15 min**  
14 min without traffic · Show traffic 7.0 miles
- via B997 15 min 8.2 miles
- via A96 and Great Northern Rd/A96 **19 min** 7.2 miles

List all steps Preview steps

A 'can't live without it' tool

But nobody calls it a GIS

Map data ©2014 Google Lite mode Terms Privacy Report a problem 1 km

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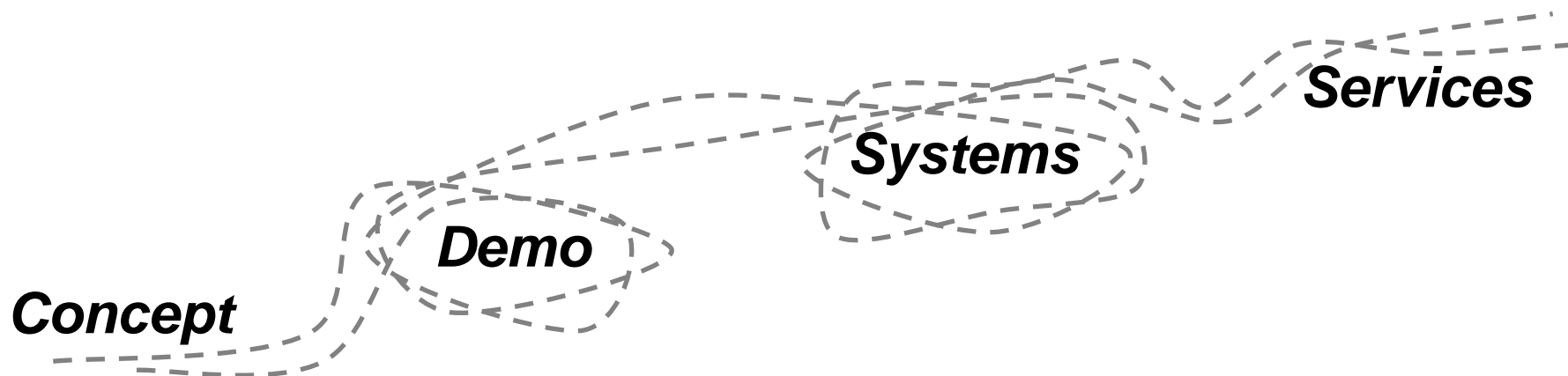
## ■ **GIS maturity**

- 1980s – New Concept – definition/academic phase
- 1990s – Prototype – demonstration/test phase
- 2000s – Commercial interest – system development phase
- 2010s – Commercial reality – service phase



## ■ GIS maturity

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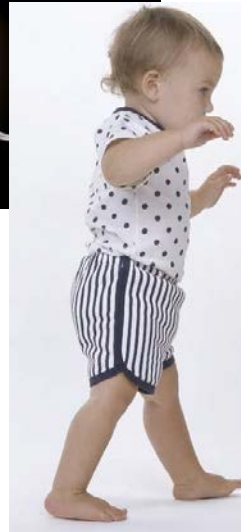
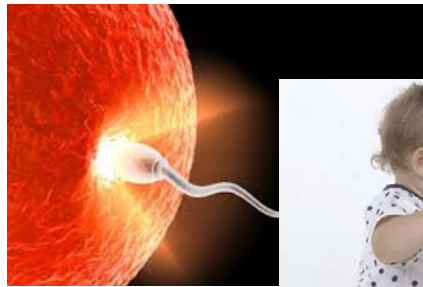




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## ■ GIS maturity

- 1980s – Conception
- 1990s – Toddler
- 2000s – Late teens
- 2010s – Middle aged



**E-navigation maturity ?**

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## ■ GIS – “A system for

- *capturing,*
- *storing,*
- *checking,*
- *integrating,*
- *manipulating,*
- *analyzing and*
- *displaying data ... ”*

(Chorley, 1987)

## ■ E-navigation is the harmonized

- *collection,*
- *integration,*
- *exchange,*
- *presentation and*
- *analysis of marine  
information ... ”*

(IMO MSC 2008)



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IMO

## ■ The International Maritime Organisation Strategy Implementation Plan (SIP)

- *5 Prioritised solutions*
- *30 sub solutions*
- *7 Risk Control Options (RCOs)*
- *16 Maritime Service Portfolios (MSPs)*
- *6 MSP areas*
- *4 Guidelines*
- *5 Stakeholder groups*
- *18 Tasks*

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## 2006 Key structural components of a safe and comprehensive e-navigation policy

Provision of accurate, comprehensive and reliable

- Electronic Navigational Charts (ENCs)
- electronic positioning signals
- all relevant data in electronic format
- transmission of information between ships and to/from shore
- user friendly display of information
- alert capability in risk situations
- transmission of distress alerts and maritime safety information

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## 2008 Definition

*“E-navigation is 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.”*

Harmonisation and interoperability

of data, systems and services

beyond Navigation !

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## 2014 SIP delivered to NCSR1

Navigation, Communication, Search and Rescue Subcommittee to the Marine Safety Committee (MSC) of the IMO

- Finalised but not yet approved
- Lack of clarity about how to manage the implementation
- Tasks not allocated
- MSC meets 17 Nov 2014
- NCSR2 meets in March 2015



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## International Hydrographic Organisation S-100 Universal Hydrographic Data Model

IHO S-100 approved as an essential component of e-navigation (**T14**)

- Based on the ISO19100 series of geographic standards
- Geospatial information registry
- Opportunity for richer data provision through combined data types
- Imagery/gridded, 3D, time varying,
- Wider user beyond navigation

**On a separate, but aligned path to e-navigation**

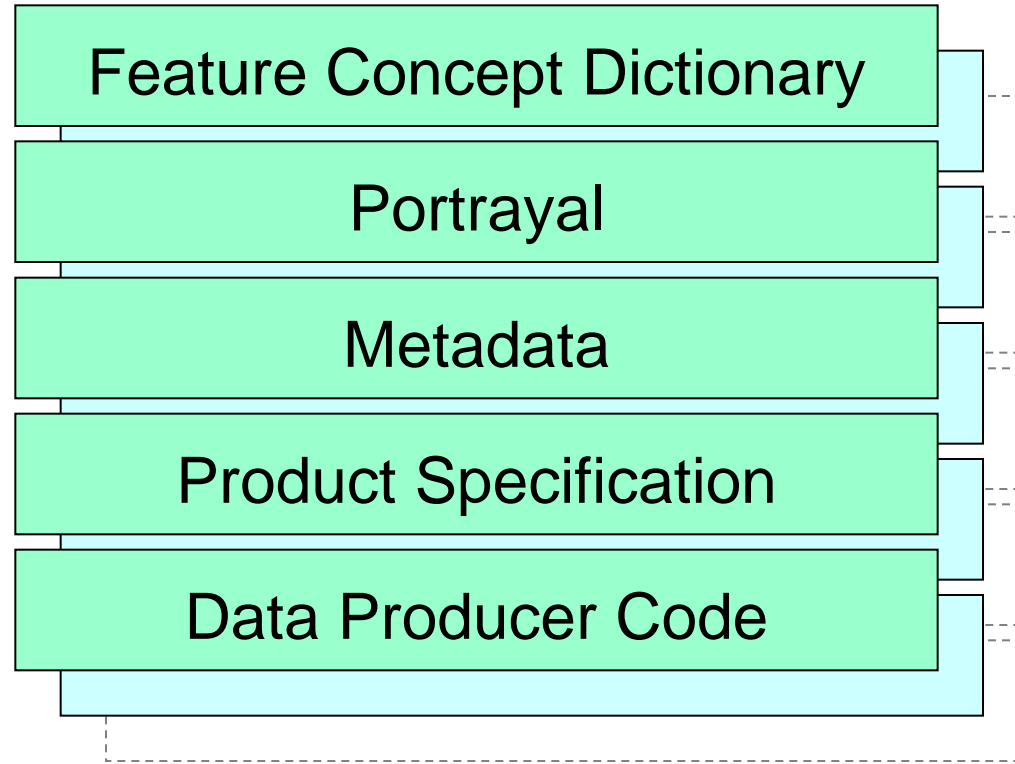
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## S-100 GI Registry



**Internationally harmonised data exchange**

**Richer data environment**

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# MSPs

# S-100



<b>MSP 1 - Vessel Traffic Services</b>	<b>IALA S-20x Inter-VTS exchange</b>
<b>MSP 2 - Navigational assistance service</b>	<b>IHO S-102 Bathymetric surface IHO S-125 Navigational services</b>
<b>MSP 3 - Traffic organization service</b>	<b>IHO S-127 Traffic management IALA S-201 Aids to Navigation</b>
<b>MSP 5 - MSI service</b>	<b>IHO S-124 Navigational warnings</b>
<b>MSP 10 - Marine assistance service</b>	<b>S-123 Radio Services</b>
<b>MSP 11 - Nautical chart service</b>	<b>IHO S-101 ENC IOC S-401 Inland ENC</b>
<b>MSP 13 - Ice navigation service</b>	<b>JCOMM S-411 Sea ice</b>
<b>MSP 14 - Met information service</b>	<b>JCOMM S-412 Met-ocean forecasts</b>
<b>MSP15 - Real time hydrographic and environmental services</b>	<b>IHO S-111 Surface currents IHO S-122 Marine protected areas IHO S-126 Physical environment</b>

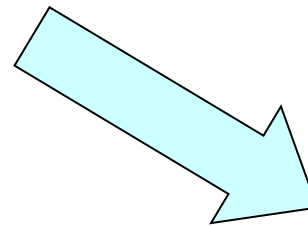
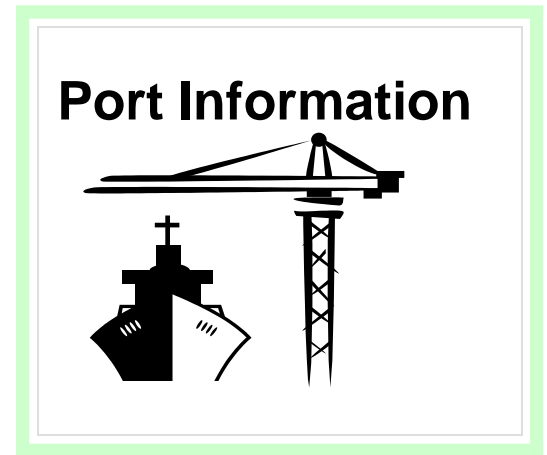
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- Vital part of voyage planning
- Web based systems available
- Increases port efficiency
- Reduces ship delays
- Commercial advantage in logistics chains beyond ports



**RCO4 MSP4**



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- Simplifies ship to shore reporting
- Smoother port clearance
- Reduces delay
- Reduces penalties
- Safer navigation due to reduced administrative burden

**T8 S2 RCO4 MSP8**

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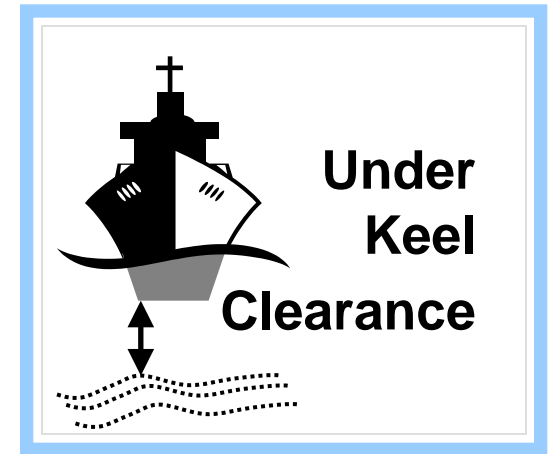






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- Essential to safe navigation
- Voyage planning
- Requires bathymetry and tidal data
- Maximizing loading provides significant commercial advantage
- Trials in place
- Commercial services exist



**MSP11 MSP14 MSP15**

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## *Piracy Service*



- Significant threat in some parts of the world
- Information needed about recent incidents
- Risk assessment based on multiple factors
- Voyage planning
- Information overlaid on ENC

**Not a SIP MSP, so is it e-navigation? T17**



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- Important for demonstration of potential
- Development of prototypes
- Moving towards local implementation
- De-facto standards?
- 7 projects listed on the IALA e-navigation portal

**e-navigation.net**



**T18**



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- Based on AIS, ARPA
- Requires bathymetry to show available safe water
- Decision support
- Automated alerts



**T17**



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## Advanced Global Communication

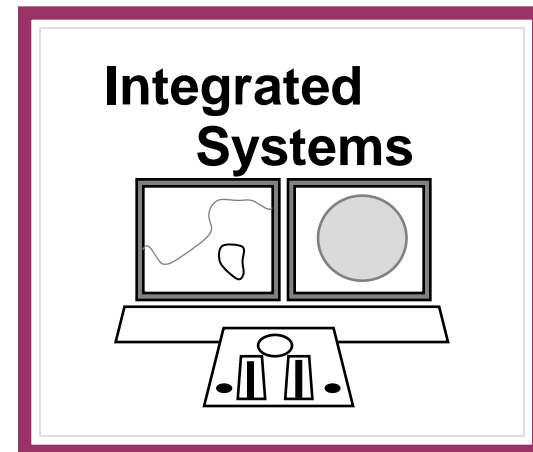


- Improved communication is vital to e-navigation
- Web based solutions not reliably available at sea
- Coastal solutions via VHS Data Exchange Services (VDES)

**T15**



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- Combination of diverse systems into a single console
- Improved situational awareness
- Enhanced decision support
- Route optimisation for increased fuel consumption
- >40" touch screens
- 'augmented reality'
- 'e-navigation made easy'
- 'e-navigation reality'

**S1 S2 S4 RCO1**

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# Do we need the IMO SIP?

- **Is it e-navigation if not globally harmonised?**
- **Maturity level?**
- **Stimulus?**
  - User driven?
  - Commercially driven?
  - Regulation driven?
  
- **Does it matter as long as navigation is evolving? ‘e-’**
- **How soon will it be a ‘can’t live without it’ service?**
- **Regardless of what it is called?**



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# Do we need the IMO SIP?

- **Ask me again in 10 years!**
- **What do you think?**