Admiralty e-Navigation & S-100

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Product Research and Development
Who are we?

- Admiralty Product and Service based R&D
- Links with Production and Defence areas
- Foster external links with Academic Institutions
- Selective Product Concept Development
- Technology and Environment Watch
Coverage

Towards e-Navigation
- The end user on the bridge. Their “world”
- IHO S-100 development
- How e-Navigation changes our world
- Benefits and costs for end users.

Data and Information
- Data “layers”

Quality, Reliability and decision making.
- Impacts on data producers
- Benefits for users
E-Navigation means Change…

What will NOT change

- Basic regulatory environment, SOLAS, ISM, flag/port state requirements.
- Planning and Inspection regimes
- Mandatory Equipment?

What “may” change

- The underlying formats (data)
- Interactions with shore (comms)
- The “functions” and facilities available to end
The architectural elements of e-Navigation

But it's complicated...
How does this change “the data”?

- Information is the lifeblood of our organisation
- Charts in the e-Navigation age
- Things which don’t change!
  - Core Navigational Practice
  - The requirement for Charts, Publications and Information to support decision making.
- ECDIS adoption is a necessary (first) step towards e-Navigation. ENC is a “foundation layer”.
- Charts become a component in a bigger system
“Charts”

Chart now
- Fixed format
- Fixed dictionary
- Fixed Symbology and portrayal
- Difficult to interface to other data
- Few links back->front of bridge
- Static, updated
- Diverse interfaces

Charts (e-Nav)
- One of a number of datasets making up a “maritime service portfolio”
- Delivered as a data stream or as hard media
- Able to be distributed around the bridge
- Can be enhanced with realtime and added value layers.
IHO S-100 development has been in progress for many years

Based on ISO191xx series of rich geospatial data standards (= “data works better together and is cheaper for systems manufacturers to embed in their software products”)

S-100 capabilities

- No more hardwired dictionaries and symbology
- Encoding and content separate
- “Compatible with ISO standards”
- Registries of features, attributes and properties.

S-100 is the backbone standard for e-Navigation

S-100 groups data into products S-101, S-102, S-103 etc etc…

ENCs will eventually all transition to S-101

The real message is wider – more data to a common standard viewed, and used within an integrated bridge. The key is the “other data”
The “Other Data”

- S-100 decouples the dictionary from the data
- Any added value layer can be represented, modelled, encoded and distributed.
- An integrated S-100 enabled bridge system should allow multiple sources of information to co-exist and be presented to a user as a unified whole – not a set of parts
- Back and Front of bridge will require development to support this – the world of “platform” and “apps”.
- Must be driven through demand by end users not imposed on a community still dealing with mandated ECDIS.
The Dangers....

• Crucial time for e-Nav and S-100
• Adoption across all players is vital
• We risk just “coming up with another format”!

How Standards Proliferate:
(See: A/C chargers, character encodings, instant messaging, etc)

Situation:
There are 14 competing standards.

14?! RIDICULOUS! We need to develop one universal standard that covers everyone’s use cases. YEAH!

Soon:
Situation:
There are 15 competing standards.

Public Service Announcement:
Our different ways of writing dates as numbers can lead to online confusion. That’s why in 1988 ISO set a global standard numeric date format:
This is the correct way to write numeric dates:

2013-02-27

The following formats are therefore discouraged:

02/27/2013 02/27/13 27/02/2013 27/02/13
20130227 2013.02.27 27.02.13 27-02-13
27-2-13 2013 II 27 27/2/13 2013 II 02/13
MMXIII-II-XXVII MMXIII XXVII 1330300800
((3-3)-(11+1)-1)x3/1-1/3=285
10/1101/1101 02/27/2013 02/27/13
Some possibilities

- **Data**
  - Denser bathymetry (where available!)
  - Port entry/exit information
  - Realtime updates buoyage, lights, routing networks…
  - MSI, Ice, Data Quality, Planning information…

- **Functionality**
  - Enhanced Collision Avoidance
  - NoGo Areas
  - Resilient Positioning
  - Planning, Scheduling and Organisation.
Dynamic no-go area calculation.
The environment

- Regulatory? Updating of systems onboard?
- Port State Control?
- E-Navigation will give maritime nations new abilities to broadcast information and will encourage regions to develop new facilities
- New, potentially more complex electronic reporting, logistical and routing systems.
- The message is:

Better communication + better data = more efficiency of operation.
Admiralty and e-Navigation

- Watching closely!
- Involvement in Test Bed projects
  - ACCSEAS, SISTALS, Mona Lisa2, Efficienseas…
- Commitment to end users
  - Need to focus on reality for users.
  - ECDIS is a major component of that
  - Added value layers of information to support passage planning.
- National and International Responsibilities
- Our aim is to be the supplier of choice for navigational data to support safe and efficient decision making and vessel operations
- There is no “e-Navigation” product. There is a set of products which will enable e-Navigation to take place and realise the benefits….
Communications - Mobile H-Note
Developing better data to support e-Navigation.

Automated production of charts at multiple scales from independent datasets
Some conclusions

• Testbeds for e-Navigation concepts

• e-Nav is entering a crucial phase of “buy-in”

• Likely outcomes

  • IMO plan is well-formed with a “draft” infrastructure
  • Adoption of next generation standards (underpinned by S-100)
  • More demand for better automation and integration of electronic aids to navigation.
  • Better integration of shorebased infrastructure with vessel facilities
  • Vessel Bandwidth will increase
  • Not all changes are relevant to all vessels
  • Elective rather than mandated services
  • Evolution of navigational practice
  • Data content, source and delivery will improve
Questions?