

**Outcomes from the S-101 Stakeholders Workshop
9 – 11 March 2010, UKHO Taunton**

MESSAGES TO IHO GENERALLY

1. Plenary Discussion

topics include:

- S-100 project plan and timetable
- cell scheming and naming
- alarms

Questions for Plenary:

1. Does industry agree to the 4 stage phased approach and what if any changes are the recommended?
2. What suggestions do you have for setting up test beds to create data and deploy in a ECDIS system and how would this be resourced?
3. Is the existing cell schema still appropriate or is there a need for a more regulated approach?
4. What changes to the way alarms are configured would you recommend?(e.g. specific configurations for different navigation situations, user configuration)

Item 4 moved to Breakout Group B session b

Workshop Conclusions / Recommendations:

- Scale Dependent/Independent approach should be incorporated earlier in the development process. Preferably, in phase 2 to give OEM's time to implement.
- Explore EU or other funding source for development of Testbeds and testing of new features. Finding resources may slow down the process for S-101 publication.

MESSAGES TO RELEVANT IHO WORKING GROUPS

a. S-101 General Content

Document S-101

topics include:

- navigation purpose/cell loading strategy
- implementing the scale dependant/scale independent cell concept
- management of support files (text and picture)
- support file formats

Questions for Breakout Group A:

S-101 will contain new concepts, the IHO needs confirmation that these are implementable

1. *will the removal of navigation purpose as cell meta data cause any issues?*
2. *do you think the new loading strategy will improve the use and display of ENC's or are there other changes you would recommend?*
3. *are the recommendations for the management of support files implementable?.*
4. *how can we future proof the introduction of new formats which may be used for support file?*

Workshop Conclusions / Recommendations:

- Navigational purpose should be included in discovery metadata but is not required by the ECDIS so it can be removed from the filename.
- The scale independent/dependent approach requires more development as issues arise regarding validation and coverage. It should be optional for producers to follow this route. JP to provide more detailed examples.
- If file size is not an issue, specific support files could be supplied for each cell.
- In order to ensure duplicate support files are removed when the associated feature is deleted; the ECDIS must search for any and delete them. The standard does not need to specify the implementation merely that redundant files are deleted.
- Agreement that a list of key support files is required which can be updated as technology changes. This needs to include as a minimum formats for text, formatted text, audio, images and video.

b. The ECDIS Interface from a Users perspective (1420)

Document A Proposal for Improving and Standardising ECDIS/ECS Pick Reports.doc

topics include:

- *S Mode*
- *pick reports*
- *new ideas for improving the user experience*

Questions for Breakout Group B:

There is an opportunity for users of ECDIS to influence the next generation of standards

1. *Does industry consider the concept of a Standard Mode display to be a useful addition to the ECDIS environment and how do you think it should be configured?*
2. *What advantages do you consider S Mode could bring? (e.g. training, pilot usage etc.)*
3. *Does the report on pick reports solve the existing issues or are there other ideas which may improve the interface?.*
4. *What other improvements to the display would improve the experience of ECDIS user?*

Workshop Conclusions / Recommendations:

- Industry response to S-Mode is positive with it being seen as a benefit for training and pilots.
- Consider a different term to “S-Mode” to avoid different interpretations of the “S”
- User and OEM engagement required to clearly capture requirements with a full use-case being developed.
- The idea of common menus or general tabs is supported and a button for resetting to default settings was also mentioned.
- S mode would need to be implemented through the performance standard – IMO Button.
- Nautical Institute definition of S-Mode:

The concept for S-Mode is to create standard features. S-Mode is not envisaged as a simplified or restricted display mode, but instead would offer a high degree of functionality. However, the use of these functions would all be standard and anyone trained in the use of S-Mode would therefore be competent and confident to make the best use of navigation systems on any ship so equipped.

The ‘S-Mode’ switch, when activated would default to a standard display (for example, head-up display, relative vectors and so on) that can then be fully manipulated through a standard menu system where functions (such as for changing range, aspect, or using EBL/VRM [electrical bearing line/variable range marker], parallel indexing etc) would all be standardised, and the input interface with the systems (perhaps track ball, joystick or keyboard) would be standard

- 3 areas of possible standardisation: Display, Controls or Functionality, Settings. Standard settings not to change Vessel settings.
- There was general agreement within the group with all the issues raised in Richard Coombes’ DIPWG document on ECDIS pick reports.
- The group agreed that Pick Reports should form part of the next generation ENC product specification.
- It was commonly accepted that cartographic text placement information should be included in ENC, to improve display. Mariners don’t like clutter and any mechanism we can use to reduce this will assist the development of ENC.
- A means of clearly showing the update state of ENC holdings would be a benefit. A report section in S101 metadata will enable OEMs to use and make an easily accessible report. When any update is entered then report generated for use in PSC, SMS, etc
- Bigger screens including widescreens (16:9 Ratio) was seen as a key benefit allowing pick reports and menus to be displayed either side of the ENC display.

c. ENC Specific Portrayal (1440)

topics include:

- *graphic file format*
- *programming language*
- *portrayal specifications embedded in the data product specification*
- *feature and portrayal catalogue delivery*

Questions for Breakout Group C:

In order to introduce a more flexible regime for upgrading ECDIS there is an opportunity to consider new innovations and programming structure.

1. *What file format and programming language would be most suitable for symbology and conditional procedures would best suit the new upgradeable environment?*
2. *Do you consider there is any merit in embedding S-52 portrayal specific details in the S-101 product specification?*
3. *What is the best solution for the testing, version control, delivery package and distribution of updates to the feature and portrayal catalogues?.*

Workshop Conclusions / Recommendations:

- Feature Catalogue, Portrayal Catalogue, Symbols to be exchanged in XML
- Nest conditional tests and aim to ultimately remove Conditional Symbology Procedures
- Portrayal may benefit from extra information being included with data eg surrounding depth area value, cartographic hints
- Ideally no conditional procedures should be needed, use XML for define rules
- Datasets to indicate compatible Feature and Portrayal Catalogues
- Portrayal catalogue should be cumulative and backward compatible.
- May force need for new feature classes
- Add/retire Catalogue
- Add/retire Feature
- Add/retire Symbol
- Reduce unnecessary distribution
- Distributors to package Feature and Portrayal Catalogues as needed, with datasets or separately.

d. Generic Product Specification Template

topics include:

- Marine Information Overlays
- Key items for a generic specification
- Procedures for checking conformance

Questions for Breakout Group A:

Given the move towards marine information overlays how can the inclusion of new product specifications be as efficient as possible

1. *What common information would be required for a generic product specification template?*
2. *What are the key areas which need to be controlled to facilitate easy implementation?*
3. *What methods would be required to ensure a product specification meets requirements and is fit for implementation?*

Workshop Conclusions / Recommendations:

- It was acknowledged that the main differences between Marine Information Overlays would be contained in the Portrayal and Feature Catalogs
- Agreed 8211 remains most appropriate for ECDIS use due to updating and the fact it is already widely implemented
- Encoding could be prescribed as 8211 where the product is designed to be used on an ECDIS
- There was some support for the standardisation of the SENC as currently its implementation is on a proprietary basis
- Gridded data could be included in 8211 using Jpeg 2000 support files
- Support files must be specifically identified eg TIFF ver 1.0.1
- AML (Additional Military Layers) community expressed that Product Specification should allow multiple encoding options
- Agreement that filename must simply be unique not prescribed
- Product type metadata field required for ECDIS loading strategy
- Marine Information Overlays Codes could be added to IHO registry
- Draw order? How will ECDIS determine this

e. Digital Nautical Publications and the Mariner

topics include:

- *user interface*
- *nautical information and its usefulness to the mariner in planning and executing voyages*
- *real time data*

Questions for Breakout Group B:

It is intended that future systems will have better capability to include information which is supplementary to the basic electronic chart.

1. *how can useful nautical information be flagged to a mariner and then displayed in a way, which will not compromise the display of electronic chart information?*
2. *what information or process would reduce the overheads experienced at either the planning stage or during voyage execution?*
3. *what real time data, which can be considered as accurate, is now widely available at modern ports or canal lock entrances? Eg Tide, Air Temperature, Currents Wind speed and direction.*

Workshop Conclusions / Recommendations:

- It was discussed that dynamic restricted areas, MARPOL regulated areas and emission regulations areas would be useful.
- A nearest medi-vac search function would be of benefit, also an integrated man overboard function would be useful.
- Passage plan – select the feature or area and single button (?) will access all information relating to the selection from SDs, ALRS, Port information, etc
- Larger and multiple monitors should be used to avoid layers causing a cluttered display.
- More detailed information required back of bridge than front of bridge.
- An example of real time data was of wind speed and direction broadcast at the Port of Southampton.
- It was discussed that the range of formats and means of accessing these was a limiting factor.
- Standardisation of real time information would ease integration with ECDIS.
- The group went on to discuss how AIS could potentially be used to carry weather information.
- The advantage of having cause dependent presentation of nautical information was discussed
- It was not confirmed that the whole book content is still required (neither printed nor digital), rather the book content should be prepared/modelled for front and/or back wheelhouse display.

f. S-63 IHO Data Protection Scheme (1410)

Document ENC Import Strategy

topics include:

- *The future of S-63*
- *Delivery and licensing*
- *Multiple encoding in S-100*
- *Role of the Scheme Administrator*

Questions for Breakout Group C:

How can S-63 be developed to benefit service providers and end users

1. *Assuming S-63 continues as a way of providing an open standard route for ENC data into ECDIS should a new edition of S-63 be derived from the existing standard or should we start from scratch?*
2. *What extra facilities or data should be included in future ENC datasets delivered to ECDIS to help loading and management of data for users and service providers?*
3. *What extra licensing / distribution policies or features would most assist OEMs and end users of ENC data?*
4. *Should we be using the multiple encodings feature of S-100 to develop more efficient encodings for ENC data prior to distribution to customers, particularly for online distribution.*
5. *Could/should the IHO's role as Scheme Administrator be preserved, strengthened or lessened and what form should it take?*

Workshop Conclusions / Recommendations:

- It seems that an open standard is seen as a “good thing” in getting data onto the bridge. A fresh approach seems to be asked for.
- Encryption needs to be retained in some form because copy protection of data will continue to exist for at least some stakeholders.
- It would be advantageous to have a protection scheme which can cover
 - Future S-10x layers (including product/portrayal specifications)
 - Online distribution of data (file based won't work).
- Should we reconsider the protocol of Add/Mod/Del and use binary patching/encoding instead? Data integrity standards should provide enough technology to re-assure Hydrographic Offices that data has been reconstructed correctly.
- Policies are built on the standards. People want to buy “areas” – can we support this? This would be a new feature in the standards. Additionally a way of “grouping” cells for unlocking would help considerably.
- Collection of metadata into one place and single sources is very important – we don't want to layer on top of an exchange set again.
- IHO should retain at least the role of “admitting” OEMs to a “scheme” of copy protection to guarantee member states the copyright of data as well as providing a top level authentication body..
- Additional data should be accessible through the S-101 product spec.
- So any better data related to service provision should be centred within the S-101 product spec.

g. Group A

topics include:

- Technical aspects of MIOs (NPubs Etc)
- Feature Catalogues

Questions for Breakout Group A:

1. As an ECDIS manufacturer in what formats would you prefer to see information on: Ports, TSS/VTs Environmental data such as Currents, Wind, Sea state and Ice?
2. If Current information was delivered in 1 or ½ or even 1/6th degree rectangles, how could you display it and use it for calculation so that better ETA's could be calculated from climatic data?
3. In what formats are 5 day weather forecasts now available? Do ECDIS already read them and display them on top of chart displays?
4. Could information that was identified during passage planning be bookmarked for use during execution?
5. **What key factors would persuade you or your organisation that the next generation ECDIS environment is a 'must have' solution? (preparation for final plenary session)**

Workshop Conclusions / Recommendations:

- Marine Information Overlays containing nautical publication data should be called Nautical Information Overlays
- 8211 suitable for data about points or areas; text or photos applied to vector data.
- GRIB more appropriate for large area weather/climatic data. Contour data should be converted to GRIB – easier for GIS tools to interpolate.
- Easier for ECDIS if climatic, real time and forecast data all in same format
- Needs to include both climatic and meteorological information
- If current known, could apply to Man overboard symbol
- Two ECDISs, which connect to internet, already have type approval. Offers possibility of real time and forecast weather information – wind; water level
- Wind speed and direction could come via AIS.
- NP's vary greatly between HO's and existing products cannot be standardised
- The Nautical Information Overlay(s) product specification(s) should standardise the content, although certain HO's may not support this
- NPs bring together a wide variety of information. Need to clarify scope and overlaps between products
- Layers may need to interact and a unique identifier will be required to ensure consistent referencing
- Think about how to provide information on Sulphur Emission Control Areas (SECA) – 3 mile / 6 mile limits

- Issue of the need to transfer weather information and passage plans from back of bridge system to ECDIS
- The idea of a route specific version of sailing directions ordered for the passage is a possibility

h. Group B

topics include:

- Data Quality - CATZOCs
- The mariner and the next generation ENC environment

<u>Questions for Breakout Group B:</u>	
1.	<i>What does the workshop perceive as the shortcomings of the existing data quality display method (CATZOC)?</i>
2.	<i>Would it be useful/feasible to warn the mariners of a change of the quality characteristics if an unplanned change of course is necessary? How would this be depicted?</i>
3.	<i>Would a traffic light overlay (semi transparent colour washes in red, amber or green) be suitable and when and under what conditions should it be displayed?</i>
4.	<i>To be of use, the traffic light system will need to operate on depth and depth is dependent upon tide. Are there any plans for dynamic tide representation in S-101?</i>
5.	<i>What key factors would persuade you or your organisation that the next generation ECDIS environment is a 'must have' solution? (preparation for final plenary session)</i>

Workshop Conclusions / Recommendations:

- Users don't understand the message that the symbology is trying to convey. Triangles with stars don't really mean anything.
- CATZOC is primarily examined during the voyage planning stage.
- Alternatives raised included the moving of the safety contour based on CATZOC values. This was dismissed as a bad idea due to reliance on the ECDIS making more decisions.
- It was stressed that the mariner needs to make a decision but the information needs to be displayed more clearly.
- The option of a pop up display that would be comparable to a source diagram.
- One proposal was to change the colour of own ships' vector based on the CATZOC value.
- The issue of tides was discussed and the question of liability was seen as an issue. The notion of a layer on top of the ENC in a different colour which may not affect the performance standard was also discussed.
- Those present indicated that tides in ECDIS was seen as a 'nice to have' and not as a 'must have'.
- KEY FACTORS
 - Monitor requirements in S-52 – drop stringent conditions to allow for new large wide-screen high definition monitors

- New layers – plug and play
- Dynamic catalogue updates and system upgrades - demonstrate clear cost and safety benefit

i. Group C

topics include:

- The future of S-63 (if required)
- S-101 ISO-IEC 8211 implementation
- Type Approval
- Role of the Scheme Administrator

Questions for Breakout Group C:

1. Is the new ISO/8211 encoding fit for purpose?
2. Given the experience gained over many years, what improvements could be recommended to make type approval more cost effective?
3. What new type approval methods would be required to facilitate the concept of updateable feature and portrayal (symbols+rules) catalogues
4. **What key factors would persuade you or your organisation that the next generation ECDIS environment is a 'must have' solution? (preparation for final plenary session)**

Workshop Conclusions / Recommendations:

8211 Encoding

- 8211 seems to work as an encoding – if it isn't broke, don't fix it.
- The encoding is derivative but for good reason. Until better modelling is possible we won't know the size implications but it is within the same order.
- One advantage is that the encoding is product neutral so any object/attribute/geometry "s-57 extension" style of data should be encodable with little or no modification.
- Concatenated data structures should be reconsidered in terms of the impact on OEMs. The effect can be simulated by using separate records at a slight byte cost.
- Size limits are useful for an OEM in that they can predict an approximate buffer for each "lump" of data being imported.
- Standard needs to be specific

Type Approval

- Type approval could fit better into OEM development schedules.
- Better, more complete and comprehensive test data will reduce cost and time for type approval.
- Major and Minor updates to type approval. S-101 updates in type approval should mean it doesn't then have to keep pace with the upgrades to IHO specifications.

- Capacity to include new products S-10n will be improved if ECDIS is subject to a process approval in place of a type approval.
- IMO / NAV / MSC can look at separation of type approval into hardware / software.
- Test datasets for updating feature / portrayal catalogues which stretch the capabilities of the ECDIS.
- Needs to include new specifications (S-10x).
- Failsafe / good/bad updates, rollback etc...
- Possibly use ASLs as an example of symbol update as it is an example which everybody knows. Could even be used in the field.

Wow Factors

- Layers. Benefit for manufacturer is removing the need to continually update systems to provide compatibility with new data.
- As quickly as possible you need more than one product spec in the market.
- Weather, tide, etc. etc... needs to be available ASAP, ice, MIO, Radio Signals.
- Inland ECDIS could be a good start? More vessels may be using both.
- Proof (to end users) that technical capabilities can be used early is very useful.
- Display "should" be immediately better... Alarms should be better. User should see better quality and more usable data. Consistency improvement should be more tangible.
- Data loading and scale consistency should be a noticeable improvement for users.
- Updates to existing systems will be easier/quicker.
- Need to complement service aspects within standards before release (learn from our experiences w/S-57).

2. Summary, Discussion on matters arising

3. Identify any Actions

including:

- mechanisms to maintain liaison/input from OEMs
- mechanisms to maintain liaison/input from users

MESSAGES TO IHO GENERALLY

- New features are not enough to force a move to S-100 ECDIS

- S-57 has used work-arounds thus far but this cannot continue
- We need a strong, reasoned argument for a move to the future navigational environment. With the limitations of S-57 and the need for ISO conformance clearly laid out.
- IHO needs to start saying no, it's not possible to please everyone all of the time. Freezing S-57 to satisfy OEM's is not the ultimate solution.
- How far away will S-57 be discontinued/unsupported ?
- Shipowners will want to get at least 10 years life from any equipment they have invested significant sums in.
- There needs to be a clearly laid out transition plan so both OEM's and Ship owners can work around it.
- IHO will need to agree a transition timetable but should wait until the advantages of S-100/S-101/S10n can be clearly demonstrated. Creating these demonstrations/testbeds should be a development priority.
- There should be a wow for the end user and this should be demonstrable to spur take up of S-100 ECDIS.
- A key objective should be the ability to develop a new product and deliver data and support files so that it can display on an otherwise unaware ECDIS.