MESSAGES TO IHO GENERALLY

1. Additional or Improved ECDIS functions

topics include:

- *update notification for symbology*
- *water levels and movement*
- *pick reports*
- *differentiating between official and other data*
- *generic product specifications for additional information layers*
- *alarms and indications*

Questions for Plenary:

Some additional or improved functions may require a change to the ECDIS Performance standard as well as improvements in the ENC data structure.

1. *What additional or improved functions are feasible and should be considered for support in S-101?*
2. *What minimum guidelines or standards would be required in a generic product specification to minimise the upgrading overheads both for ECDIS users and data producers?*

Workshop Conclusions / Recommendations:

- S-101 – should describe the product produced by HO – not the product delivered by Distributor.
- Dynamic tides should be implemented ASAP (with appropriate safeguards).
- An MIO is an appropriate way to deal with tidal stream information.
- ENC licences/permits should not require significant end-user management/intervention. Simplification of the processes is required to make it less complicated for the customer.
- IHO/IHB should participate in IMO NAV Work Item concerning maintenance of Navigation software
  - Seek a division between type approval for hardware, software and software updating.
  - Additionally, WG to provide Joe Collins with any practical proposals ASAP for input to NAV54
- S-52 requires major revision.
  - This will require expert contributor input and most likely contractor support to achieve.
- An implementation schedule is required for S-101 as soon as possible.

MESSAGES TO TSMAD S-101 DRAFTING GROUP

2. Detailed topics

Plenary briefing/discussions:

a. exchange set structure
   topics include:
   - catalogue file
   - folder structure
   - support files

b. data storage (1420)
   topics include:
   - cell size
   - volume naming

Questions for Breakout Group A:

1. *Is the present S-57 exchange set, structure (catalogue files, etc) and support files(tif, htm, pdf, jpg, etc) still a valid concept?*
2. *If not, what are the alternative options?*
3. *Is the current 5MB cell limit appropriate? What are the alternative options? Do limits need to be set? What should be the overarching guidelines and principles?*
4. *Are there better options for volume naming? What are they?*

Workshop Conclusions / Recommendations:

Exchange Set

Support files

S-101 Discovery Metadata should replace catalogue file. Would contain all info already in catalogue file but would include additional metadata to enable such things as plain language naming of cells, status and currency info regarding standards dependencies, et cetera. This file would form part of the VARs "product file".

Digital Publications

Should be described in their own S-100-based product specifications.

Cell Size

Strict enforcement of 5MB needs to be relaxed.

Fixed limit may not be needed or may be moved into an addendum which can be updated more frequently

Grid cell system will only work if the INT system is positively accepted. This is difficult to achieve because of sensitivities over political boundaries in some areas.

Establishing a data performance benchmark may be a better way of determining the maximum cell size.

Object oriented GIS principles rather than Cell based packages may be better for certain users/VARs.

Any significant changes to cell sizes need to be tested with manufacturers.

Volume naming

Destination CD was discussed as a means of defining where the data physically exists (on which CD/media)

c. Data Loading

topics include:

- handling data of different scales
- handling overlapping data
- loading of permits
- data error warnings

Question for Breakout Group B:

1. *How should overlapping and data of differing scales be managed / organised by S-101 for ECDIS?*
2. *Should the concept of Navigation Purpose Code be carried forward to S-101? Should it be modified or replaced by other arrangements? If so, what and how? What are the impacts?*
3. *What improvements can be made to the current arrangements for loading and managing permits?*

4.	*What improvements can be made to avoid low-level data warning messages appearing on loading ENCs?*

Workshop Conclusions / Recommendations:

- Scale management
  - compilation scale should mean optimum display scale
  - list of allowed scales should be established
  - no overlap in a single scale, but another scale can have any overlap
- Reduction of overlapping data
  - publish aids to navigation as separate layer
  - publish other objects as before
- Product catalogs
  - should be based on real coverage, not cell limits
- Navigation Purpose is only useful for Chart Catalog purposes
- Use of Navigation Purpose for chart drawing selections should be discontinued
- Permits are a distribution issue – not S-101
- End users want to pay for a certificate which proves that the vessel has a contract for up to date charts. This certificate should have an appendix which specify charts covered by the contract
- End users want to see all charts as managed database instead of individual cells. Especially they need a date up to which this database is updated.
- Management of individual expiry dates is difficult. Easy permit is based on single expiry date
- Limit warnings to severe only
  - update synchronization, missing files, CRC etc.
- Revise IEC Test Data Set
  - current test data set include examples and instructions for illegal object, illegal attribute and invalid value of attribute => detection of them is checked in type approval
  - one purpose is to check correct presentation of question mark. This should remain but instructions should clearly limit use of test to displayed chart
- How to inform manufacturers, data providers and data producers
  - For remaining warnings ECDIS should make a single log-file, which can be given to data producers
- ECDIS should have a mechanism to indicate if a cell has problem with up to date state
- How manufacturers and type approval bodies know what to do
  - somewhere there should be clear written instructions

d. ENC distribution, import and data protection

topics include:

- data compression

- encryption
- authentication

Questions for Breakout Group C:

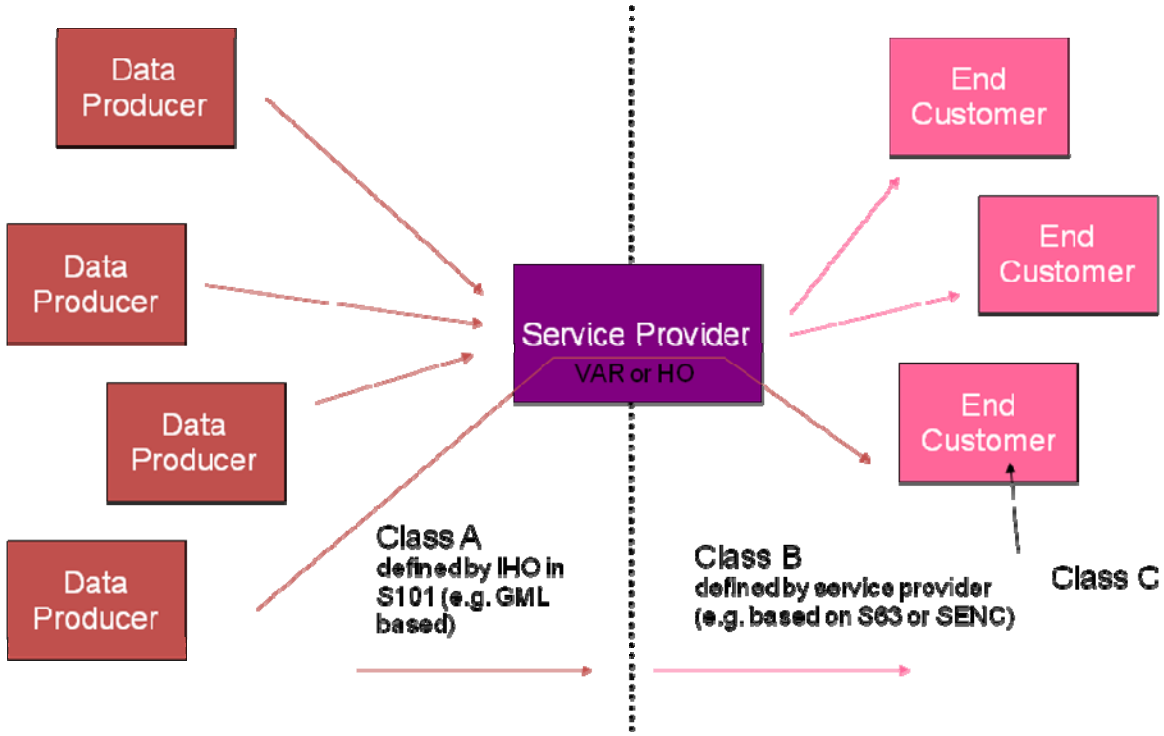
IMO and others appear to expect a standardised delivery format for S-101 ENCs.

1. *Should this continue to be based on ISO/IEC 8211? If not, why not?*
2. *What are the alternatives to ISO/IEC 8211 and what are their advantages / disadvantages?*
3. *If an alternative to ISO/IEC 8211 was feasible, who would develop such a standard delivery format for S-101 ENCs? Industry? IHO? IEC? CIRM? Others?*
4. *How should data validation and protection be addressed in S-101?*
5. *What are the options for data authentication and protection in S-101?*

Workshop Conclusions / Recommendations:

- By the time S101 is in place we are confident that "SENC distribution" will be mature enough that a single mandated encapsulation from source to end user will not be required.
- There should be a single encapsulation for use between data providers and service providers up to the point of "commercialisation" of ENC data.
- This encapsulation needs to have data integrity/authentication mechanisms such as digital signatures but is unlikely to require a complete encryption solution. XMl/GML seems like a likely candidate.
- Definition of the "final format" which transmits data to the bridge should not be defined within the IHO. The service providers should define their own formats/encapsulations by agreement and licence with the ECDIS "industry".
- The term "SENC" should be refined. There are three classes of formats identified, each with their own requirements and characteristics
    - Class A - Transfer of data from data producer to service provider
    - Class B - Transfer of data from service provider to end user
    - Class C - Format of data stored within the ECDIS (SENC)
- Each class has different requirements:
    - Data integrity and authentication are the major requirements for data communication between producers and service providers (Class A).
    - Service providers also need data encryption in order to produce a commercially viable data service (Class B). Compression is important for onward transmission
    - ECDIS has different requirements (Class C) where a tradeoff is made between data size and performance.
- There is a need to allow the market to sort out how the value is added and encourage growth. Standards should support business models, not define them.
- Notified bodies, class societies currently certify formats for transmission to end users using criteria of lossless conversion and data integrity.
- Defining an encapsulation ahead of time is imposing a solution on an industry which has probably grown up by this point.

- The IHO and HOs should define their format/encapsulation for onward communication with service providers.



e. Data display

topics include:

- symbology - standardisation
- text and picture files
- differentiating between official and unofficial data

Questions for Breakout Group A:

IMO and others appear to expect a standardised display and user interface (UI) for the use of ENCs.

1. *How can a standardised display and user interface be developed, maintained and updated?*
2. *Can there be various levels of standardisation for the UI and symbology? for example 3 levels such as (Lvl1)strict conformance, (Lvl2) observe guidelines, (Lvl3) unlimited options ?*
   If yes, what functions would fit in which category?
3. *Who should set the display and UI standards?*

Workshop Conclusions / Recommendations:

Develop/maintain Std Display

- IHO role is on the standard or baseline requirements for the chart display, not the user interface.
- Menu system not in scope but will be influenced by IHO input.
- IHO should develop standard terminology for chart related terms and functions. Suggest a glossary with all standardized terminology, including abbreviations.
- The existing specification for fonts is sufficient.

- Colors and others are well defined through display certification.

Pick-Report

- Standardise the Pick-Report to ensure better usage uptake.
- Reference is made to the Presentation Library.
- Availability / prominence of Notes need to be improved. Notes need to be displayed without interfering with charts
- Create a functional performance standard for display of notes, including definition of importance and/or notification means. This will allow best practice methods available from industry.
- The standard needs to focus on the chart content.

1.1 UI Symbology

- More critical is what needs to be displayed. The criticality of display is needed.
- Standard display contains that. As such this topic is already taken care of.
- Discussion circled around wrecks with unknown depth but in non dangerous depth. The usage of existing attributes could allow the systems to differentiate and display or not.
- A standard suite of palettes defined by IHO should be the default display but OEMs should be allowed to offer alternative palettes. Ground rules should be set for this.

Who does what

- IHO standard should restrict to data delivered by IHO community.
- Chart symbology is part of the IHO responsibility. S-52 (Presentation library - Appendix) needs to be "fixed".
- A major review of S-52 is required. This will need resources not available in IHO.
- Industry participation is needed. This includes contribution (e.g. resources to perform the task) as funding may not be available within IHO budget.
- Chart presentation should be reviewed in relation to Human Factor Research results.
- IHO needs to find ways to facilitate the process. This could be part of the work of the CSMWG.
- Additional attributes for "de cluttering" and rotation of labels may help in dynamic display de cluttering.

IEC Std

- Type navigational standards are more linked to IEC.
- They are more focused on the functional requirements.
- It defines if the display is "fit for navigation".
- Standard IEC-62288 needs to be referenced.

f. Automated upgrading

topics include:

- feature catalogues
- symbol catalogues
- impact on type approval

Questions for Breakout Group B:

1. *What technical options are available for "plug and play"-type upgrading in the ECDIS equipment of things like "feature catalogues", "symbol libraries", et cetera?*
2. *How might this affect type approval of ECDIS?*

Workshop Conclusions / Recommendations:

- Feature catalogue
  - easy case, everybody agrees machine readability and publishing by publisher of Product specification (e.g. S-101 by IHO, AML by NATO etc.)
  - format of machine readable catalogue should be defined in S-100. (most suitable format e.g. ISO 8211 or XML or ? must be agreed)
  - version of feature catalogue should be linked to publishing of new version of Product specification. Consider minor and major version numbering.
- Portrayal library
  - open standard to do everything by machine readable files is technically possible, but difficult to create and result is not optimal for performance of drawing
  - OEMs see different presentation as a possibility to differentiate in competition
  - "plug and play" should be done by individual OEMs and this process should be type approved by each OEM
  - version of portrayal library should be linked to publishing of new version of Product specification (S-101, AML etc.). Consider minor and major version numbering.
- Type approval should be more flexible
  - can this be achieved ? IMO and IEC normally do these things not IHO
- Proposed method for "plug and play" includes both machine readable files and software upgrade by individual OEM
  - result is that software changes, which traditionally implies new type approval
  - IHO needs to provide documentation of delta for version changes as well as dataset for testing

g. Compatibility
   - S-57 3.1 → S-101
   - S-101 → S-57 3.1

Questions for Breakout Group C:

Forward compatibility (S-57 data used in an S-101 environment) should be straightforward.

1. *Given the richer content and changed structure of S-100 is backwards compatibility possible?*
2. *Are there any other methods and mechanisms that TSMAD have not considered?*

Workshop Conclusions / Recommendations:

- Service Providers must take a central role in working closely with Data Producers and ECDIS manufacturers to implement the IHO strategy.

- Data Producers must strive to deliver new enriched S-101 ENCs that the ECDIS users want to use.
- HOs must take the initiative in driving the S-101 standard forward.
- Provide S-101 data containing improved data content that ECDIS users want to make use of.
- Work closely with Service Providers to migrate to the new standard that minimises the impact on the ECDIS user.
- Initially it may be necessary for Data Producers to issue ENCs in both S-57 and S-101. This will give Service Providers breathing space as the new standard is taken up by ECDIS manufacturers.
- Develop tools that allow S-101 ENCs to be downgraded to S-57 ENCs
- Must implement a phased (evolutionary) migration to S-101 ENCs
- Implement a degree of backward compatibility so that ECDIS can use ENCs produced using either standard (S-57 or S-101)
- Provide suitable distribution models
- Harmonise data prior to delivery, by providing user friendly data that ECDIS users can easily use
- IHO must liaise closely with Data Producers and Service Providers to an agreed timescale when S-101 is introduced and S-57 is phased out. Provide implementation dates for S-101 ASAP