

DF Governance Document

Objectives / Background

- Objectives
 - Introduce the current draft of the DF Governance document
 - Plan out completion of the document for submission to HSSC
- Agenda
 - Background and Progress so far
 - Description of sections
 - Q&A

S-100 ECDIS Governance Document.

The Governance Document has the following aims:

1. Recognise and define each of the stakeholders and end users of the S-100 ECDIS Capture all the relevant details at a high level and describe the “changes” required across the entire ecosystem.
2. Describe the S-100 ECDIS and the Dual Fuel “concept”,
 - Build the picture for the end user from the multiple data layers and products.
 - Explain how these component parts interact together in the defined stages of navigational processes according to IMO definitions.
3. Detail the IHO’s transitional period.
4. Fill in the detail between the conceptual IMO processes, the defining standards, the producing entities and the supporting stakeholders; so from each users’ perspective, how they contribute to the operation of the system by the user. Produce a summary of the details included in existing IHO standards.
5. Define how primary supporting bodies can support distribution and any likely changes.
6. Define summary information suitable for communication with IHO member state stakeholders and the community defining S-100 ECDIS focused on the IMO Performance Standard

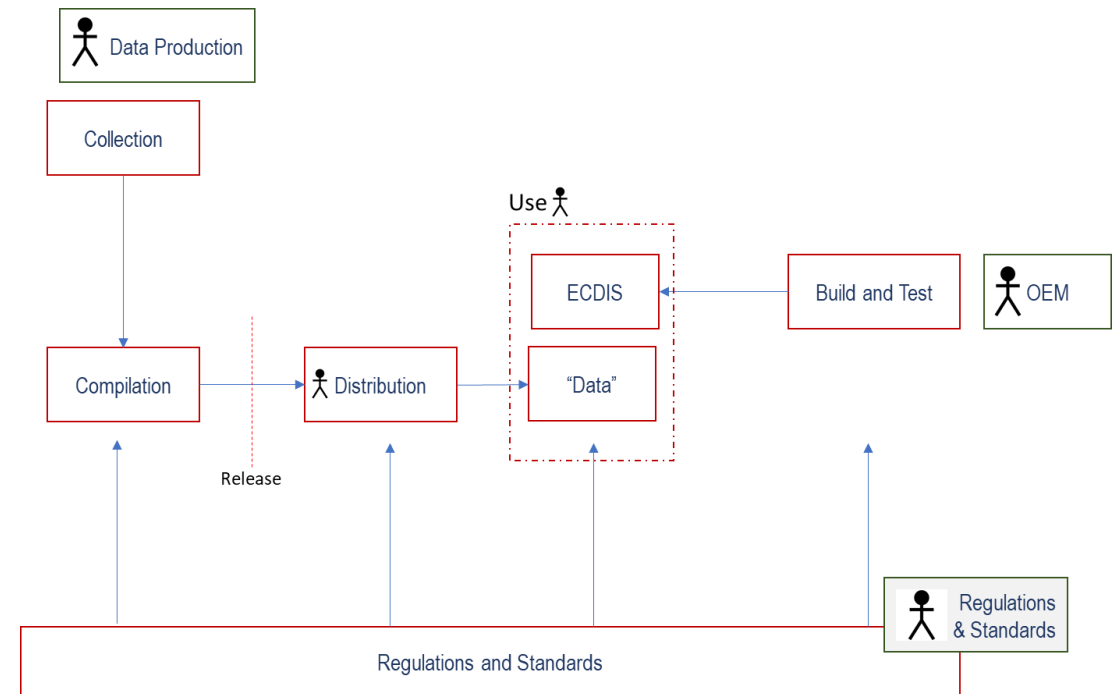
Progress to date

- Workshops held for
 - OEMs
 - Data Producers and IHO Member States
 - S100WG Technical Representatives
 - Additional sessions
- Production of Draft
- S100WG Review and Comment

Stakeholder analysis

Different stakeholders have different needs from the Governance Document:

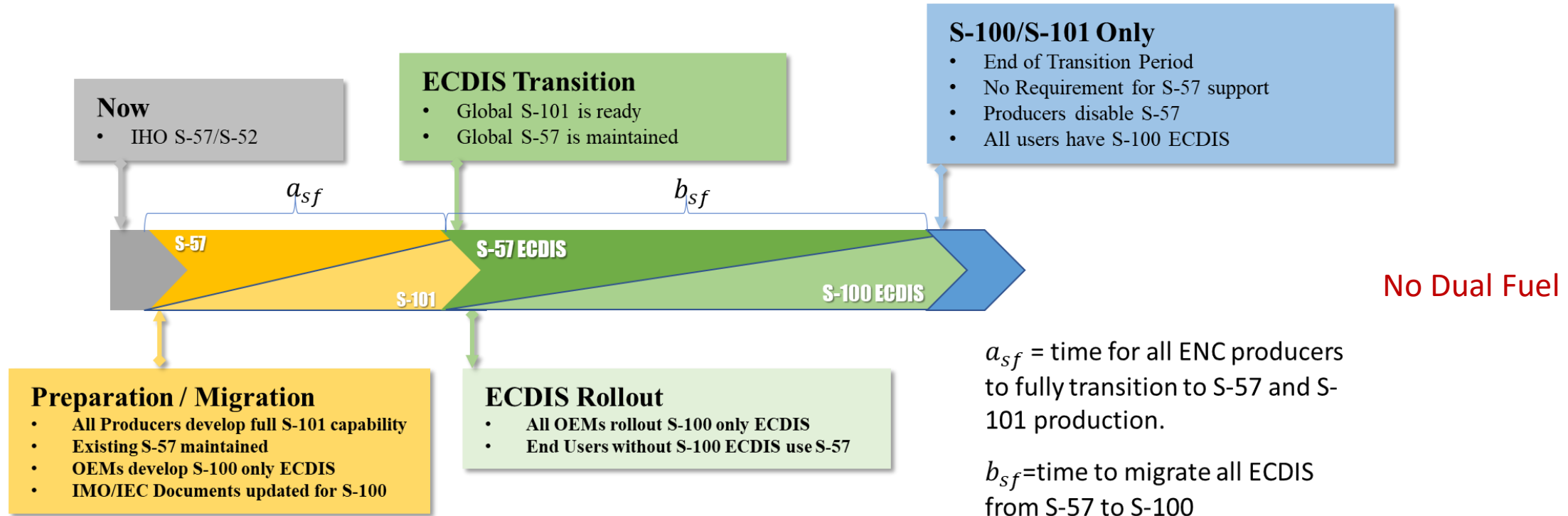
1. **Data Producers** require comprehensive descriptions of options available to support DF and definitive statements of how ECDIS implementation will use their data.
2. **ECDIS OEMs** require precise descriptions of how S-100 implementation should be achieved, with assurances that the technical standards are sound, unambiguous and complete.
3. **Regulators and representatives of IHO technical working groups** require confidence that the full spectrum of the international conventions defining the requirement for ECDIS have been addressed without omission, and that technically rigorous and sound approaches exist in all the component standards.



Governance Document Structure

- S-100 and ECDIS Background
- Rationale for Dual Fuel
- Operation of S-100 ECDIS in Dual Fuel mode
- Support from the IHO community
- List of primary and supporting standards
- Identified gaps / further areas for development

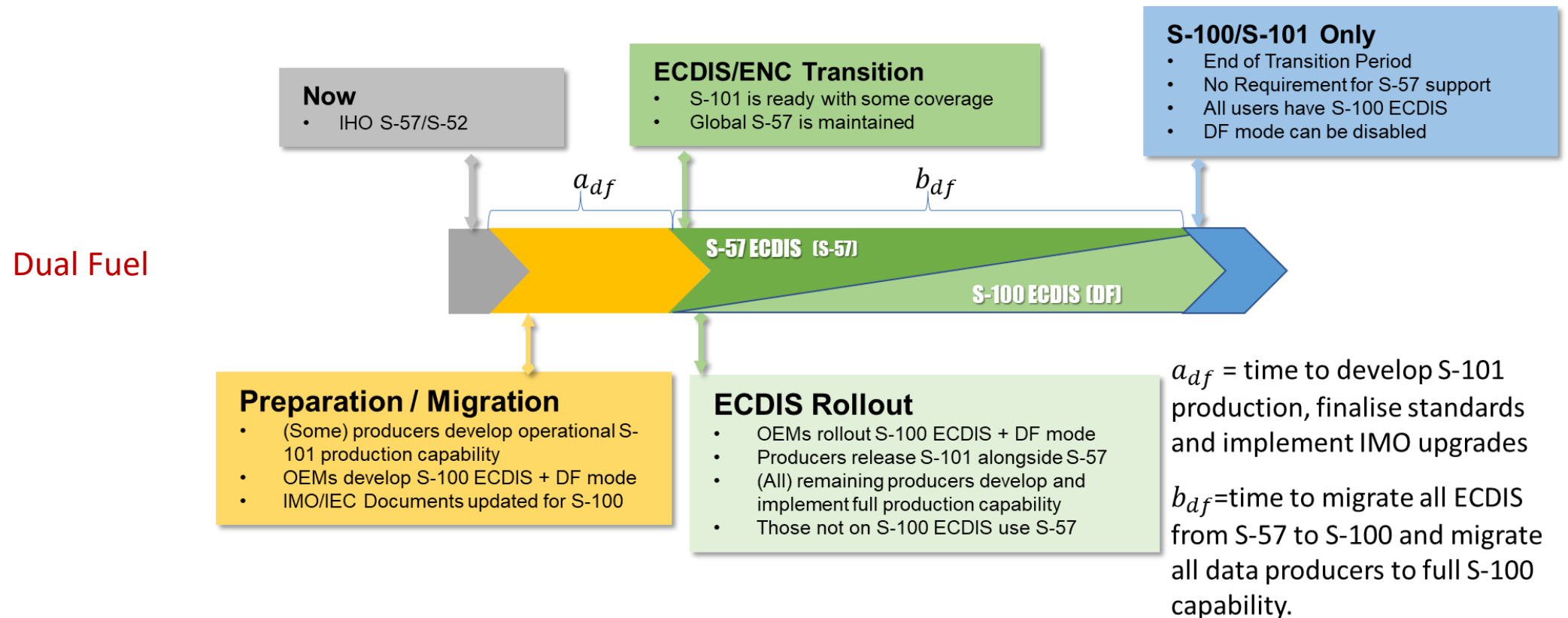
Why do we need dual fuel?



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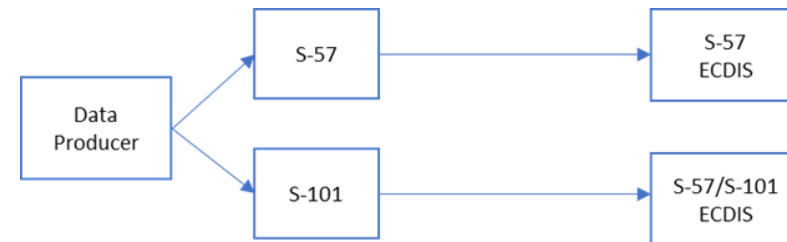
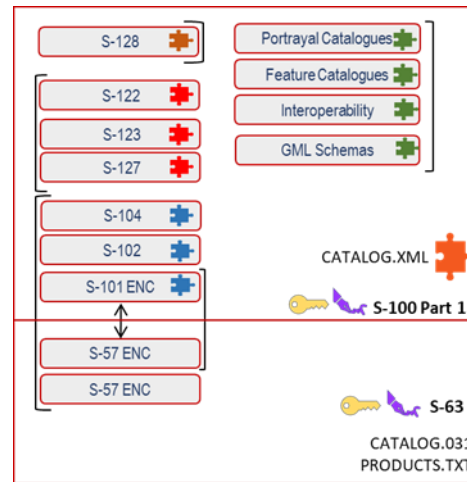
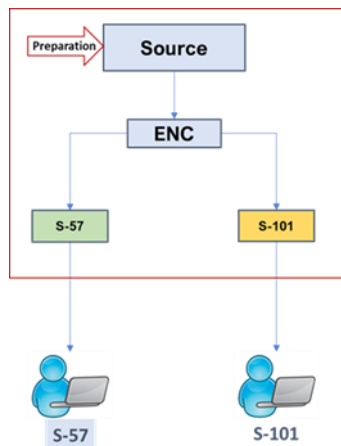
The rationale of Dual Fuel Mode as the means of delivering transition from S-57 to S-101 charts is that:

- The challenge of converting ENC charts from the S-57 form to the new S-101 form, is simply not perfect nor complete
- Waiting until all data producers have fully transitioned to S-101 entails unacceptable delays for both data producers and OEMs (as well as end users).



What is Dual Fuel Mode?

Applies across the whole chain (Production, Packaging, Distribution, Import, Selection and Portrayal/Use)

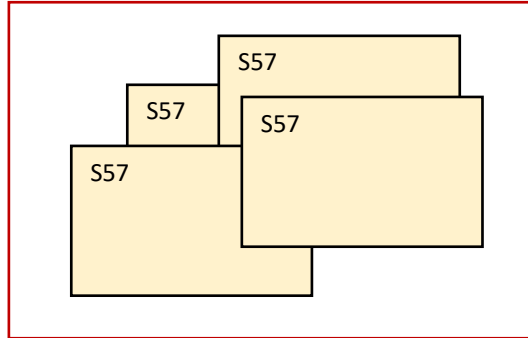
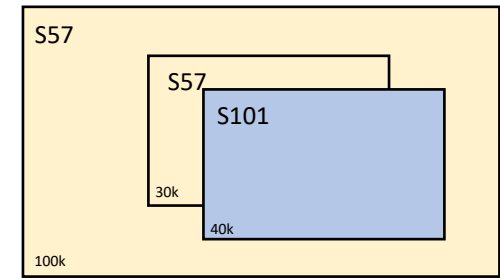


On the ECDIS it extends vertically as well as horizontally

Dual Fuel Mode

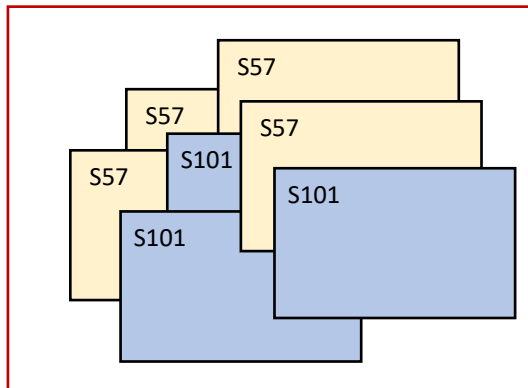
- No technical objections to DF mode operation on the ECDIS. Most OEMs have implemented multiple data portrayal/operation before with other data products
- Most unknowns are around support and clarifications of how it is to work in practice
- There are still some areas which remain to be worked out, notably loading strategy, equivalence of charts between S-57/S-101 and how a single user interface can be presented (instead of two)
- Portrayal of DF mode needs to be enhanced to define vertical as well as horizontal priorities
- S-98 Annex C contains initial guidance on Dual Fuel operation. This can be refined with S-98 testing

- Package – What is presented to the ECDIS on media
- Ingest – What the ECDIS loads
- Selection – How the ECDIS decides what to use given MSVS and contents of SENC
- Use – How it “uses” the SENC contents for portrayal and behaviour



Now

1. Currently, ECDIS is capable of loading all data presented to it into the SENC and then making a consistent, coherent picture for the end user
2. Data is “ordered” by CSCL and usage bands. Crucial to be able to order data to the display and determine what is authoritative (when required)
3. Currently, no “equivalence” is defined between S-57 and S-101 data between concepts of “scale” (CSCL vs Maximum Display Scale) or “dataset” (S-101 Chart “X” is “the same” or “part of” Chart “Y”) (could be in S-128?)
4. Loading Strategy discussions haven’t (yet) established this so there’s no ordering (or ability to substitute) across S-57 and S-101. Lack of Usage bands adds to the challenge.
5. Important to distinguish between rules which are technically enforceable on the ECDIS, through S-98 and guidelines of best practice for data producers (e.g. Gaps)

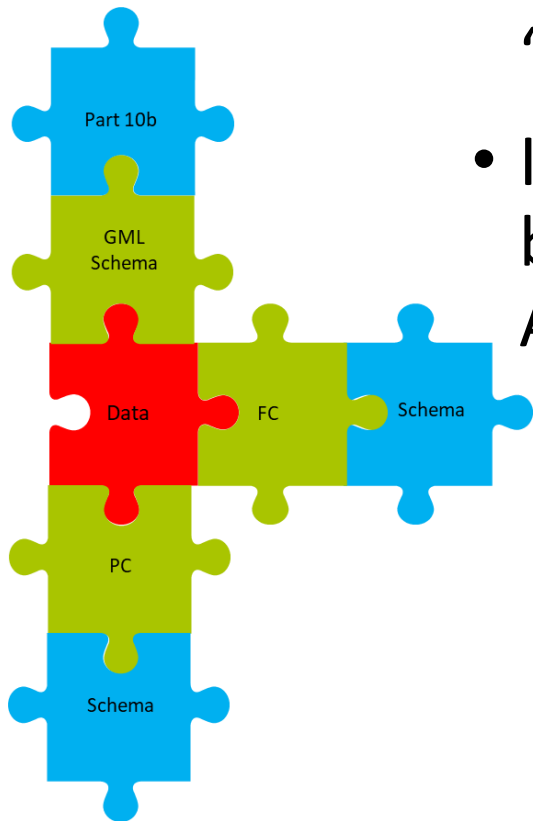


Transition period

	S57	S-100 ECDIS (DF Mode)
Package	Anything	Anything (Hybrid Exchange Set)
Ingest	Everything (licenced)	Everything?
Selection	Everything	Largest Scale / Preference for S-101
Use	S-52/OEM	? Loading Strategy

How S-100 ECDIS operates?

- How does S-100 ECDIS ingest, import, store, select and use data which is in S-57 and S-101 form?
- To what extent is data/catalogues “sanity checked” (not “Validated”) against S-100 schemas and/or file formats
- Import and Authentication (like S-63) of data needs to be better defined to be unambiguous. There is a start in S-98 Annex C



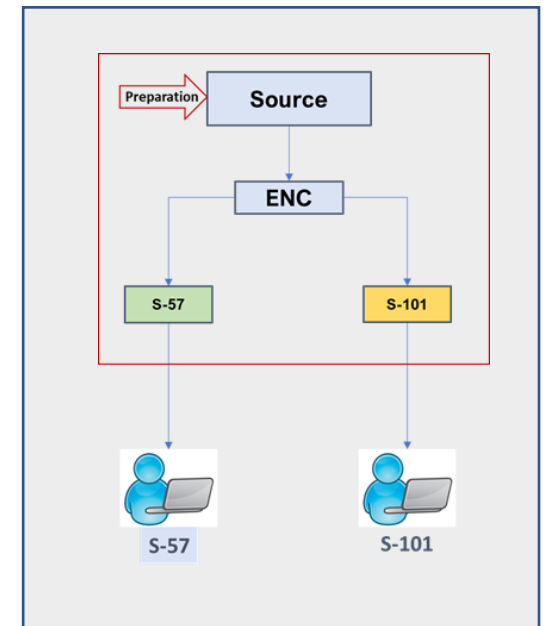
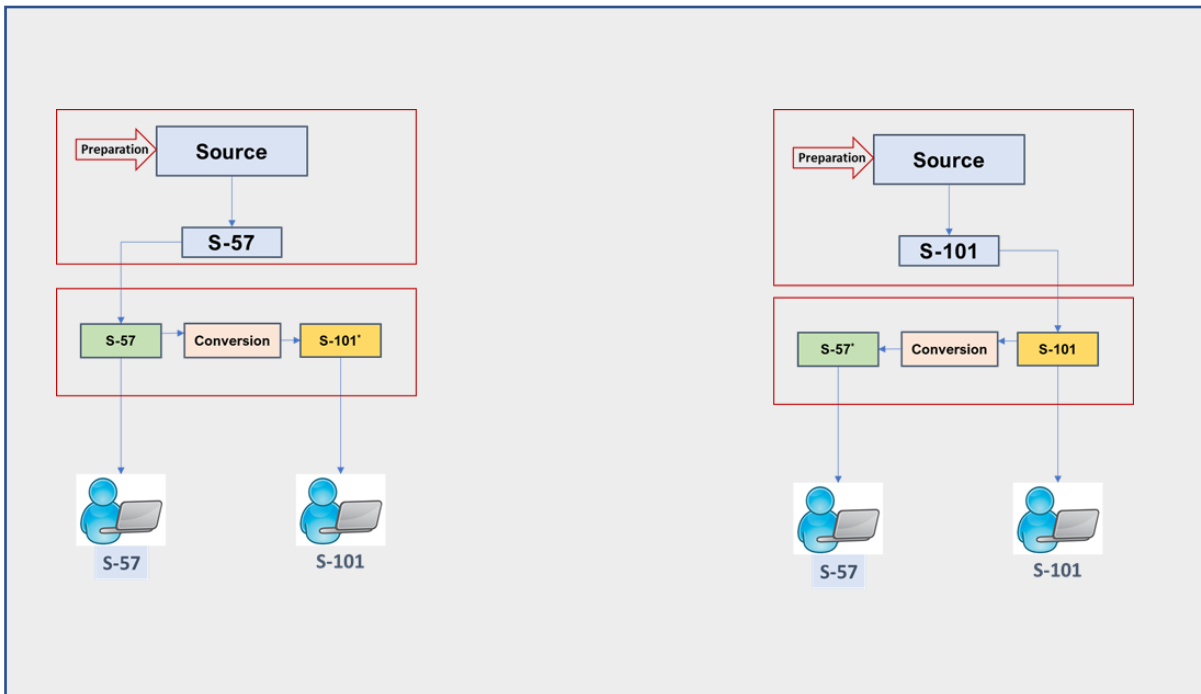
	S57	S-100 ECDIS in Dual Fuel Mode
Data Packaging	Anything (S-57/S-63)	Anything (Hybrid Exchange Set, Part 17 Metadata defines S-57/S-100 combined contents)
Data Ingest	Everything (licenced, S-63)	Must install at least S-101 version if available, may install both if “S-57 mode” is required.
Selection from SENC	All Installed data	Largest Scale with Preference for S-101 where scales are equal.
Use	S-52/OEM	Portrayal

Data Production Options

Work of the conversion group has focused on “initial” conversion of a source database to support S-101 production.

Two main categories of model have emerged:

- Conversion.
 - Data producer produces either S-57 or S-101 data exclusively.
 - Post-extraction automated process converts data into one or other form.
 - So, either Produce S-57 and converts to S-101 or produce S-101 and backwards convert to S-57.
- Co-Production.
 - Use a single model (effectively aggregating the S-57 UOC and the S-101 feature catalogue/DCEG) to extract both S-57 and S-101 data



ECDIS functions

- Early stages of IMO PS revision and update
- Important to distinguish between what is a “chart” and an overlay to a chart
- Also require categorisation of equivalence of S-100 product specifications with types of nautical publication for clarity (many to many)
- Feeds into operating model for S-100 ECDIS
- Strongly implies carriage requirements hold for NPs in the same way as Charts (must be kept up to date) and liability

Product Specifications categorisation:

1. ENC – S-101, S-401
2. ENC-like – S-102, S-104, S-111
3. Nautical publications – S-12*

Equivalence categorisation:

1. Charts = ENC
2. Tide Tables = S-104 + S-111
3. Sailing Directions = S-127 + S-131 + S-101
4. List of Radio Services = S-123

THE MARITIME SAFETY COMMITTEE,

NOTING that the up-to-date charts required by SOLAS regulations V/19 and V/27 can be provided and displayed electronically on board ships by electronic chart display and information systems (ECDIS), and that **the other nautical publications required by regulation V/27 may also be so provided and displayed,**

7 DISPLAY OF OTHER NAVIGATIONAL INFORMATION

7.1 Radar information and/or AIS information may be transferred from systems compliant with the relevant standards of the Organization. **Other navigational information may be added to the ECDIS display.** However, it should not degrade the displayed SENC information and it should be clearly distinguishable from the SENC information.

7.2 It should be possible to remove the radar information, AIS information and **other navigational information** by single operator action.

7.3 ECDIS and **added navigational information** should use a common reference system. If this is not the case, an indication should be provided.

Identified areas for development

- **Dataset Versions.** No concept of “S-100 version of a corresponding S-57 cell”
- **Revision of IMO Documentation.**
- **Loading Strategy.** Incomplete for ENC’s and non-ENC data
- **ENC Co-Production Strategies.** Much work focused on initial conversion rather than ongoing production strategies.
- **Scope of Implementation for OEMs.** How much of S-100 is required for ECDIS?
- **What Overlays what?** Can all producers overlay ENC’s or should it be restricted. Should ENC layer be S-57 and S-101?
- **Support for external communities.** Likely to require a step change in support, test data, guidance documentation and distribution of S-100 machine readable schemas.
- **Impacts of enhanced functionality.** New features on ECDIS need thorough testing by end users and data producers.
- **Number of revisions to support on ECDIS.** How many revisions of product specs to support (≥ 2 ?) and process for their rollout
- **Phasing out S-57.** How does this happen?
- **Impact of changes on end user.** Governing the changes rolled out to the user during (and after) transition period.
- **How to update S-100?** Is edition 5.0.0 the last version of S-100? Practically, how would it be updated?
- **S-128.** Crucial position for revision control / catalogues.
- **Categorisation of Product Specifications.** ENC’s, ENC enhancement, Nautical Publications. Needs assignment of categories and statement of equivalence
- **S-100 ECDIS operating model.** Needs holistic description. Distribution, Import, Selection, Portrayal and Use.

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S-100 ECDIS / DF

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- **Phasing out S-57.** How does this happen?

Plan for completion

- First draft available on meeting website
- Comments welcomed, individual or group sessions for detailed review possible as well
- First edition to be prepared for HSSC approval
- Areas for development should feed into S-100WG plans and be tracked to completion
- As standards develop, document updated to reflect editions, issues and resolutions