S-101

The New ENC Product Specification

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S-100 Working Group Chair

S-101

- Major step forward in product specifications for Electronic Navigational Charts
  - Improved Modeling
  - Greater Flexibility
  - Interoperability
- Based on S-100 – the Universal Hydrographic Data Model
- Will eventually replace S-57 (in the future)

S-101 New Functionality

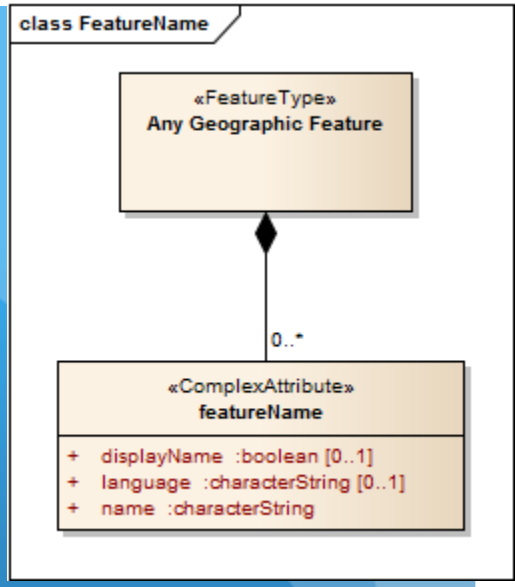
- Dynamic ENC content
  - Exchangeable Feature and Portrayal Catalogues
  - Machine Readable
    - New content will NOT take years to implement
    - New content will NOT require new type approval for ECDIS
  - Interoperable with other S-100 product specifications
    - Sailing Directions
    - High Resolution Bathymetry
    - Surface Currents
    - Weather
    - Tidal Information

S-101 New Functionality

- Revised the concept of usage bands
  - ONLY for CATALOG purposes
- ENC data tied to display scales
  - Maximum Display Scale
  - Minimum Display Scale
- Data Cannot overlap within the same maximum display scale

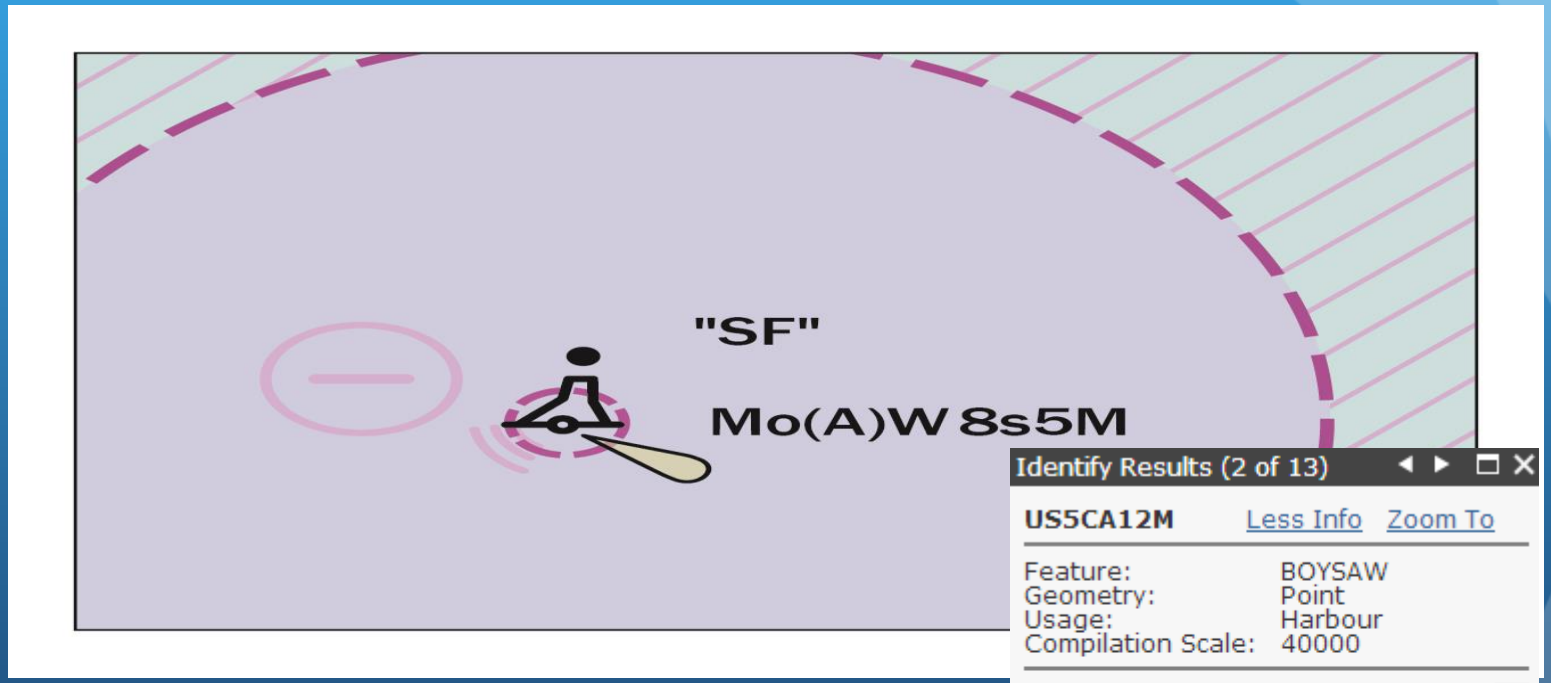
Display Scale
1:10,000,000
1:3,500,000
1:1,500,000
1:700,000
1:350,000
1:180,000
1:90,000
1:45,000
1:22,000
1:12,000
1:8,000
1:4,000
1:3,000
1:2,000
1:1,000

S-101 Complex Attributes

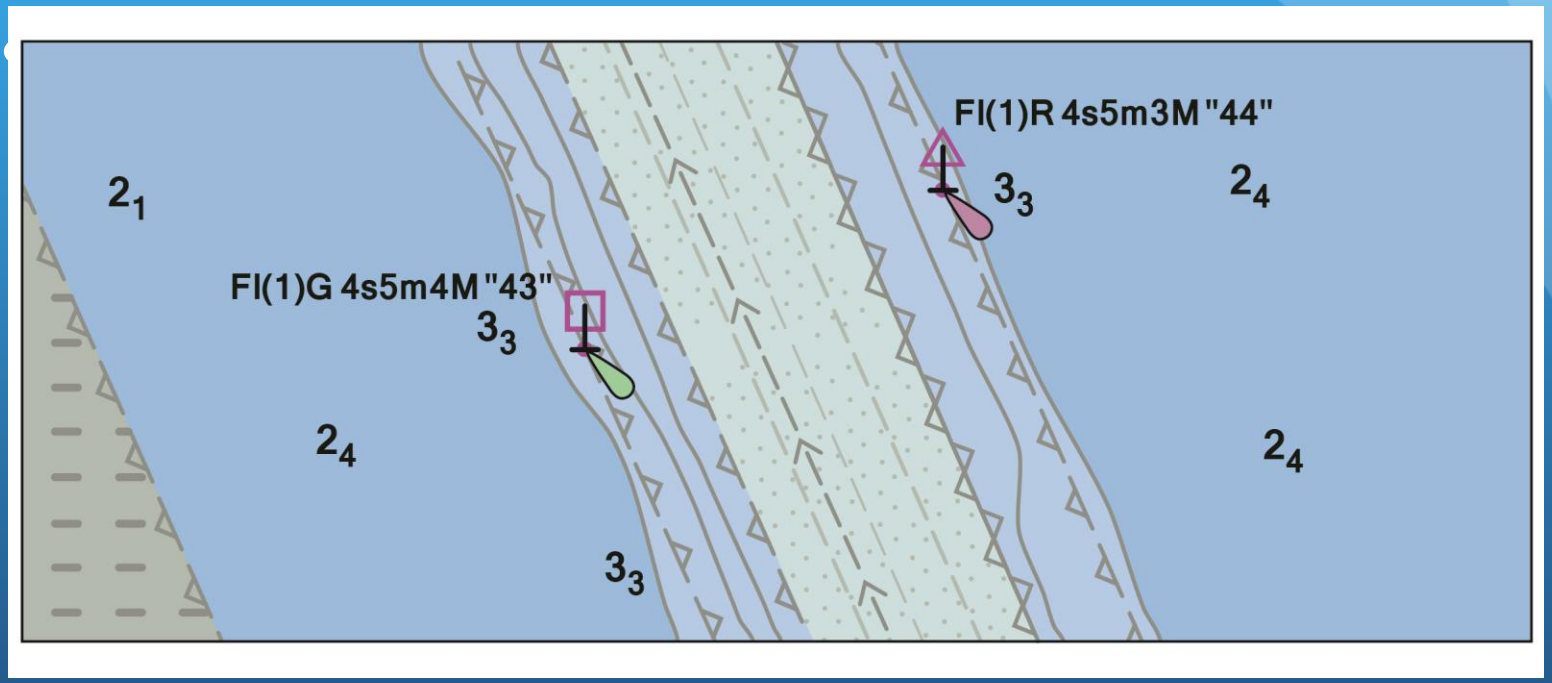


- Improved Modelling
- Introduces the concept of sub attributes
- S-57 modelled proper names using OBJNAM
- S-101 introduces the complex “Feature Name”
  - Display Name
  - Language
  - Name
- Allows for multiple languages and encoding of a “short name”

S-101 Display Name

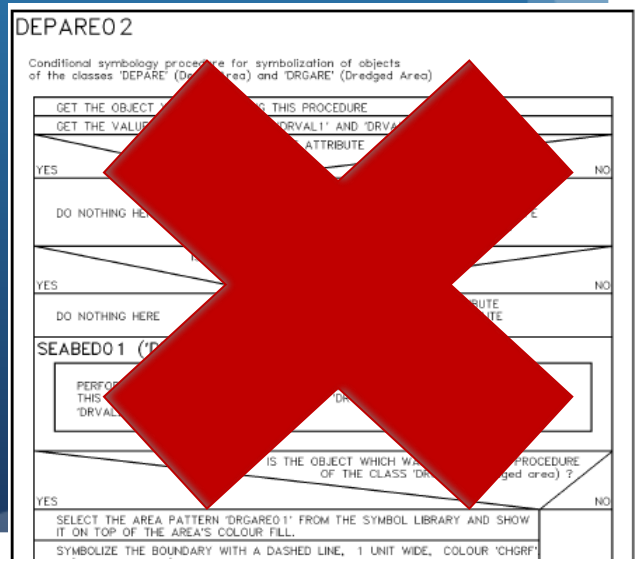


S-101 Text Placement



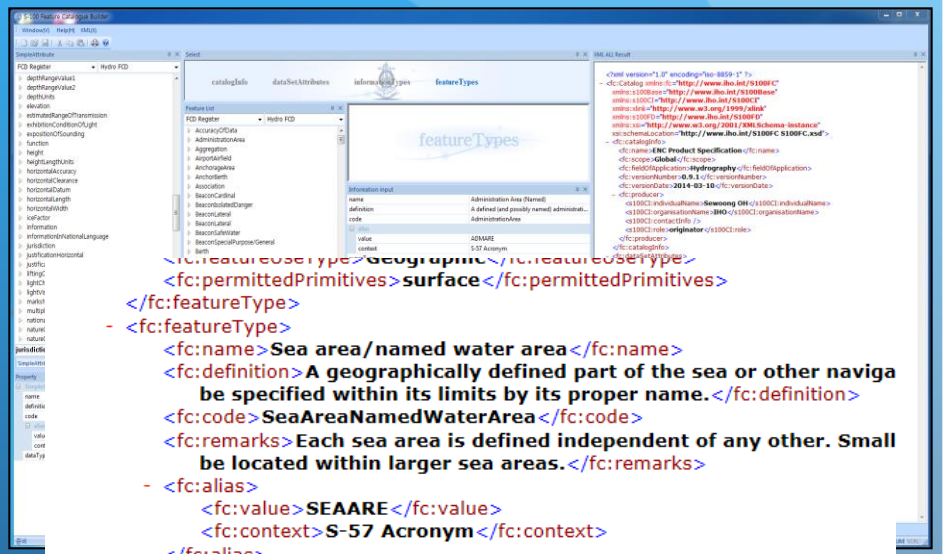
S-101 System Attributes

- S-52 CSP's are complicated
- S-101 has created system attributes to help eliminate the need for the most complicated of CSPs
- Removes the need for complicated processing on the ECDIS
- Calculated by the ENC production systems
  - Default Clearance Depth
  - Flare Angle
  - Sector Extension
  - Surrounding Depth



S-101 Machine Readable Catalogues

- Feature Catalogues
  - XML format
  - Binds features, attributes and enumerants together
  - Assigns Point, Curve or Surface to each feature
  - Establishes Feature associations



```
        <fc:permittedPrimitives>surface</fc:permittedPrimitives>
    </fc:featureType>
  - <fc:featureType>
        <fc:name>Sea area/named water area</fc:name>
        <fc:definition>A geographically defined part of the sea or other naviga
            be specified within its limits by its proper name.</fc:definition>
        <fc:code>SeaAreaNamedWaterArea</fc:code>
        <fc:remarks>Each sea area is defined independent of any other. Small
            be located within larger sea areas.</fc:remarks>
      - <fc:alias>
            <fc:value>SEAARE</fc:value>
            <fc:context>S-57 Acronym</fc:context>
        </fc:alias>
      - <fc:attributeBinding>
          - <fc:multiplicity>
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                <s100Base:upper infinite="false" xsi:nil="false">0</s100Base:upp
            </fc:multiplicity>
          - <fc:permittedValues>
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                <fc:value>56</fc:value>
            </fc:permittedValues>
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        </fc:attributeBinding>
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      - <fc:attributeBinding>
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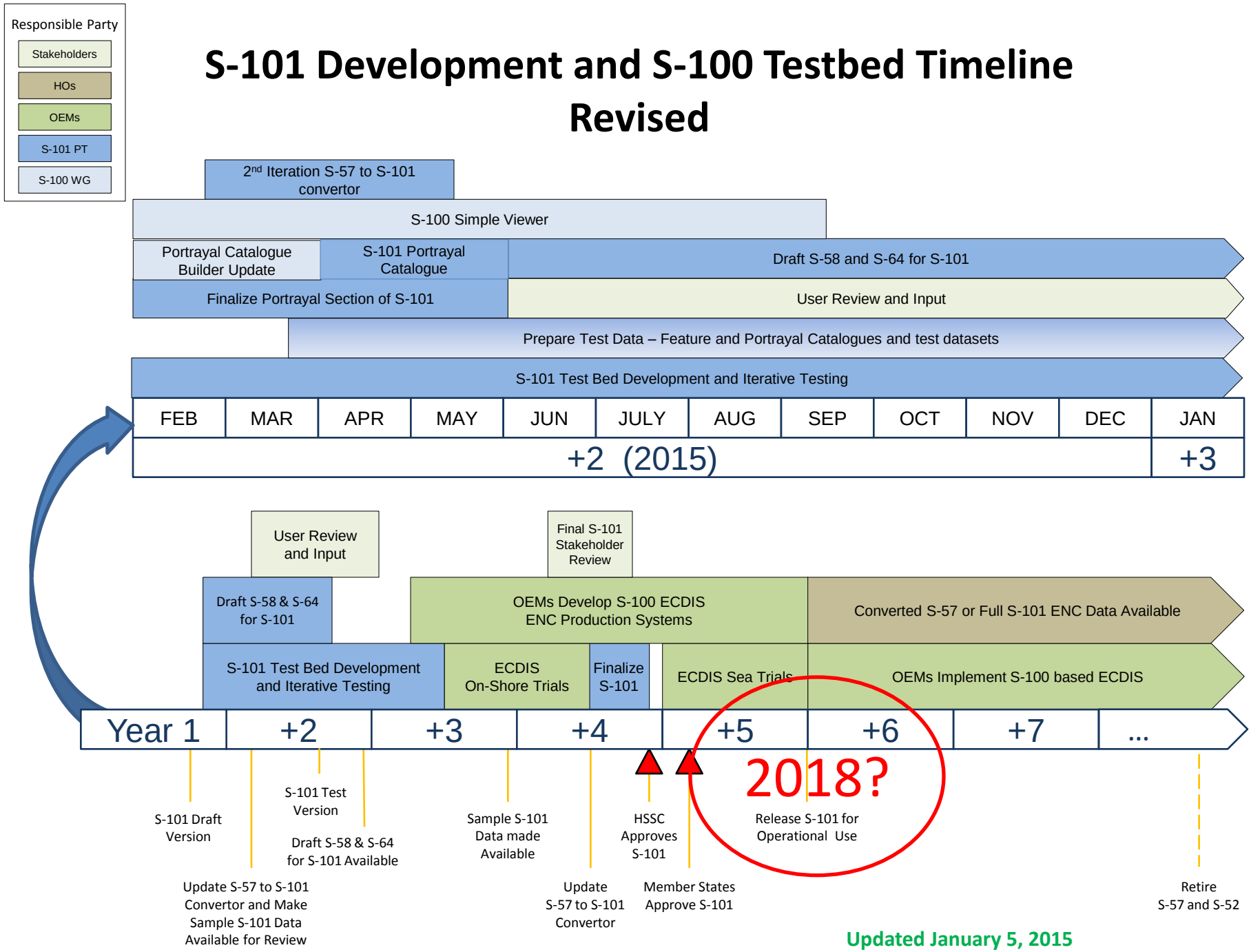
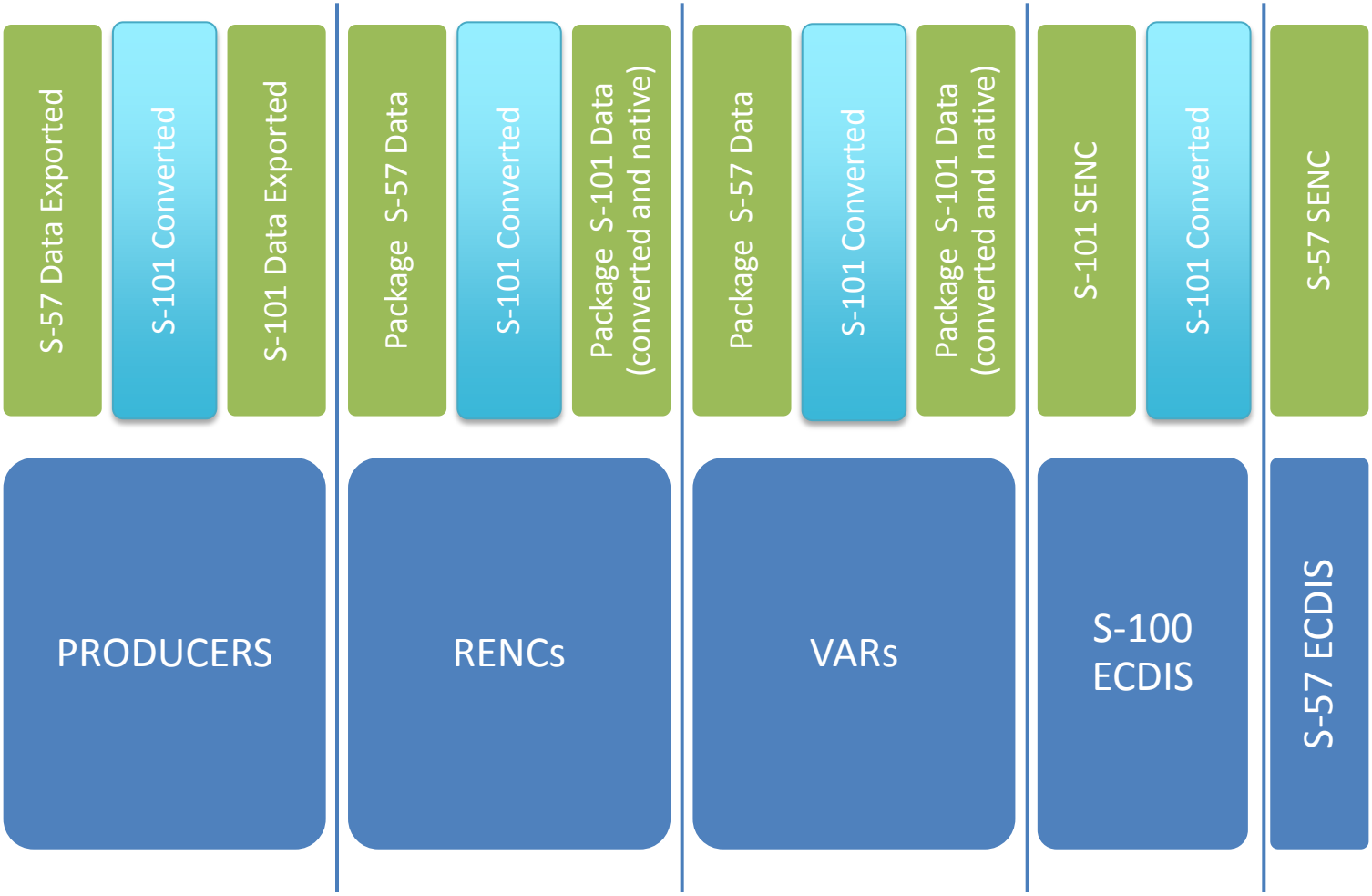

Responsible Party
Stakeholders
HOs
OEMs
S-101 PT
S-100 WG
S-101 Development and S-100 Testbed Timeline
Revised
2nd Iteration S-57 to S-101 convertor
S-100 Simple Viewer
Portrayal Catalogue Builder Update
S-101 Portrayal Catalogue
Draft S-58 and S-64 for S-101
Finalize Portrayal Section of S-101
User Review and Input
Prepare Test Data – Feature and Portrayal Catalogues and test datasets
S-101 Test Bed Development and Iterative Testing
FEB
MAR
APR
MAY
JUN
JULY
AUG
SEP
OCT
NOV
DEC
JAN
+2 (2015)
+3
User Review and Input
Final S-101 Stakeholder Review
Draft S-58 & S-64 for S-101
OEMs Develop S-100 ECDIS ENC Production Systems
Converted S-57 or Full S-101 ENC Data Available
S-101 Test Bed Development and Iterative Testing
ECDIS On-Shore Trials
Finalize S-101
ECDIS Sea Trials
OEMs Implement S-100 based ECDIS
Year 1
+2
+3
+4
+5
+6
+7
...
2018?
S-101 Draft Version
Update S-57 to S-101 Convertor and Make Sample S-101 Data Available for Review
S-101 Test Version
Draft S-58 & S-64 for S-101 Available
Sample S-101 Data made Available
Update S-57 to S-101 Convertor
HSSC Approves S-101
Member States Approve S-101
Release S-101 for Operational Use
Retire S-57 and S-52
Updated January 5, 2015

What does this mean for the IHO?

- Period of dual production will be needed
  - S-57 to S-101 Data Convertor will be provided until HO's can transition to dual production
- Dual Distribution
  - S-101 Data for those ships that have an S-100 ECDIS
- S-101 ENCs can have a completely different scheme
- Transition will have to be carefully considered
  - Updating of both products

Data Conversion Options



What does this mean for WEND?

Display Scale
1:10,000,000
1:3,500,000
1:1,500,000
1:700,000
1:350,000
1:180,000
1:90,000
1:45,000
1:22,000
1:12,000
1:8,000
1:4,000
1:3,000
1:2,000
1:1,000

- Moving to a set of a scales may result in new overlaps
  - Data must not overlap at the same maximum display scale
- May resolve some existing overlaps
- Opportunity for the RHC's to establish ENC schemes at small and medium scales
  - Gridded approach

Beyond S-100 and S-101

- Multiple Product Specifications are in the works
  - Coast Pilot Information
  - Marine Protected Areas
  - Ocean Forecast
  - Surface Currents