IIC TECHNOLOGIES

IIC Technologies:

A Stakeholder's perspective:

Our (continuing) S-100 Implementation and S-100 Tools

jonathan.pritchard@iictechnologies.com

IIC Technologies

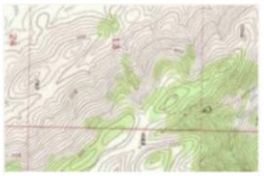
- IIC Technologies provides solutions and services for the acquisition, management, integration and dissemination of geospatial data.
- Global Presence – Clients in over 30 countries
- End-to-end geospatial solutions to the Aeronautics, Defense, Government, Infrastructure, Marine, Oil & Gas, Transportation and Utility sectors.

Marine Sector.

- Production of Marine Charts and publications data for Navigation
- Consultants on international standards for hydrography with over 25 years experience in pioneering digital navigation
- Senior Consultants specializing in modelling, development, data production and cross-sectoral integration.

Software solutions &

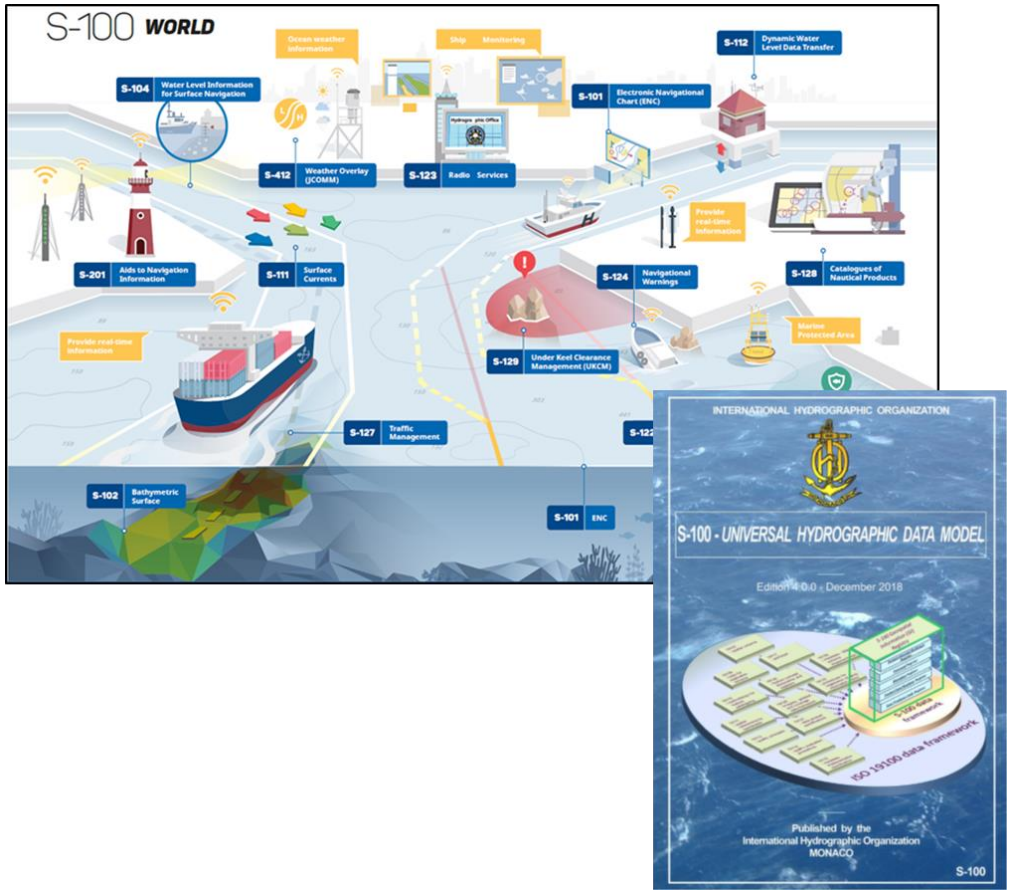
Marine Solutions


Terrestrial Solutions

GeoSurveys

Technical Strategy and Portfolio

- Our toolset focuses wholly on an implementation and supporting tools for S-100 edition 5. All our technology implements the framework
- Supporting the standard development process through S-100, S-98, S-164, product specifications
- Generation and publishing of:
  - Models, Feature Catalogues and GML Schemas
  - Actual Data for any product specification
  - Metadata/Signatures and S-128 to support services
  - New data, legacy data conversion and transformation



…the answer is S-100, the question is how to get there.

We create technology to answer the “nuts and bolts” questions…

DESIGNING THE INTERNAL “DATABASE”

Validation between products

Data Production

S-128, do I need to…?

GML?

S-101 migration, how? Updates???

Feature Catalogue import

Language Packs

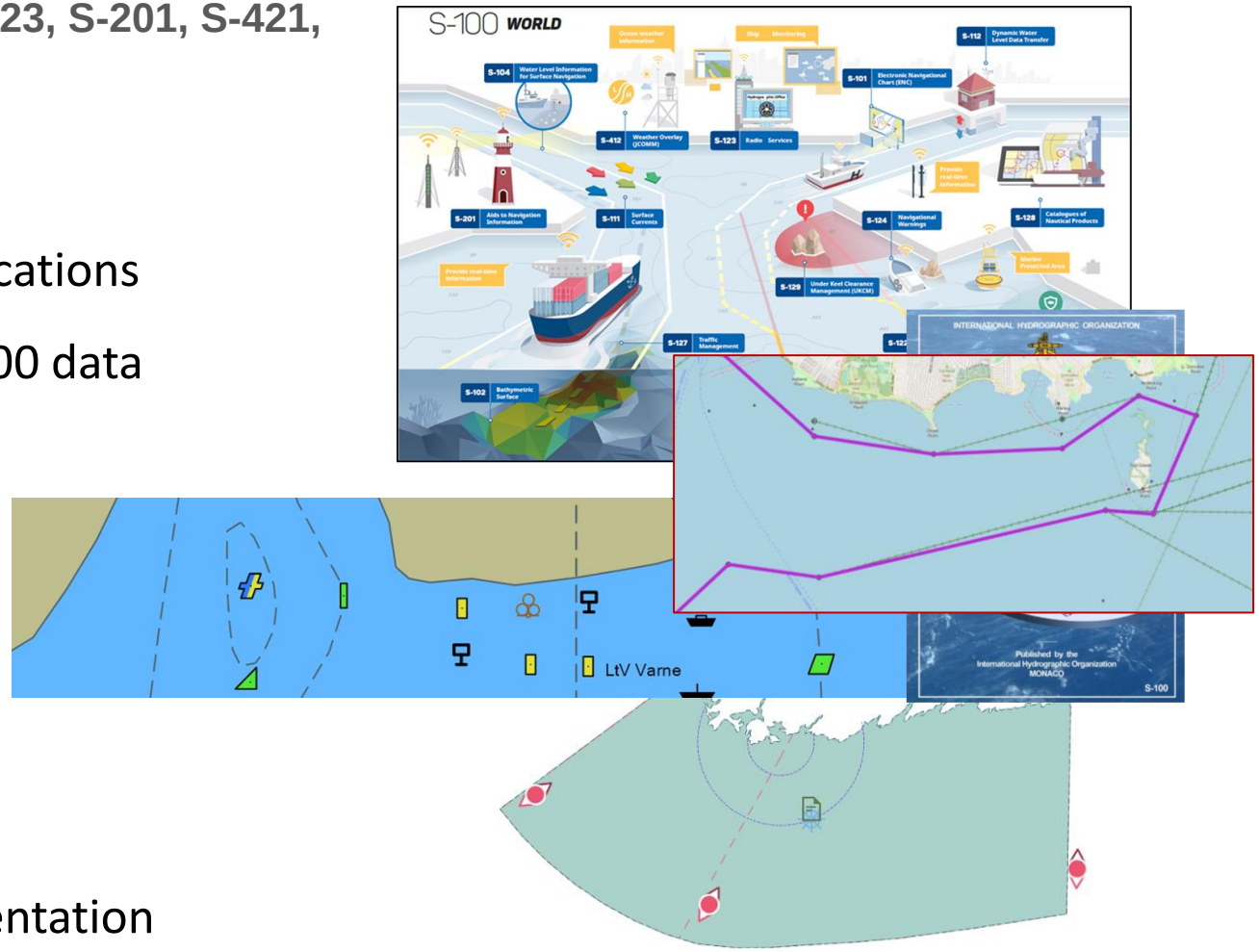
Should I create S-102, S-104, S-12X…?

Digital Signatures, do I need one?

Metadata, CATALOG.XML

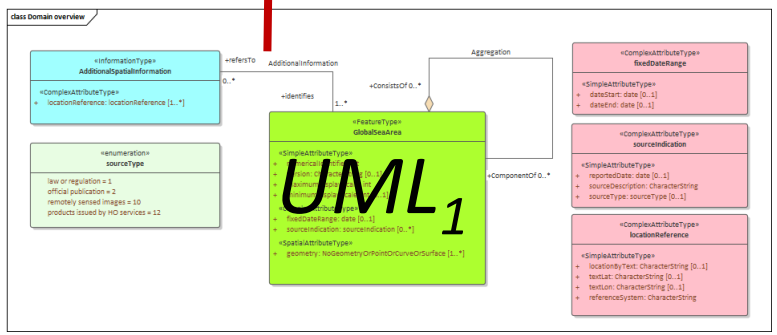
Our view as an implementer IS our implementation:

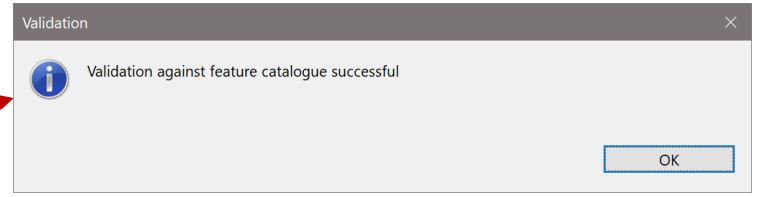
- Multiple S-100 products
  - **S-101, S-102/S-104, S-128, S-131, S-130, S-127, S-123, S-201, S-421, S-121, S-122, S-124**
- Digitisation of S-101 and S-12X products
- Modelling, creation and support for product specifications
- Migration, Transformation and Manipulation of S-100 data
- Legacy data management
- Relational Database migration
- Creation of Metadata
- Part 15/Part 17 implementation
- Interoperability testing and demonstration
- Software library and API development and implementation
- OGC API interoperability, Search engine optimisation for IHO data
- **Training**

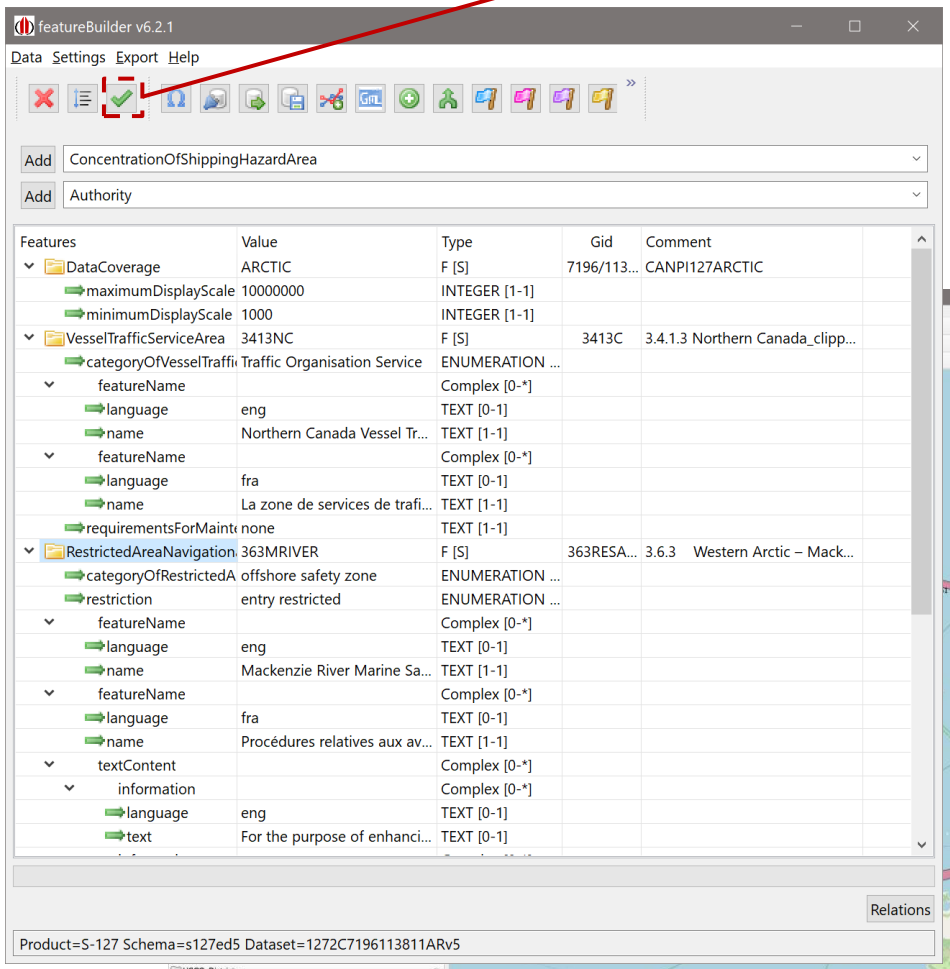


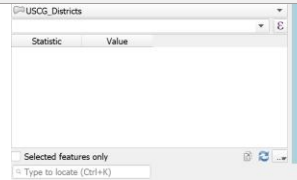
Dataset

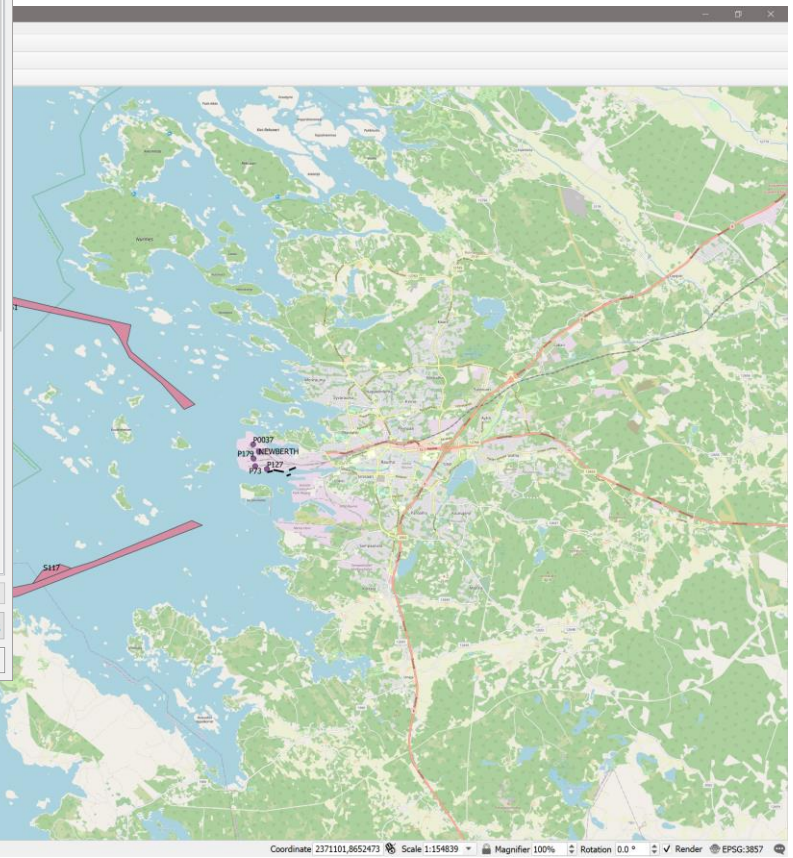
Feature catalogue



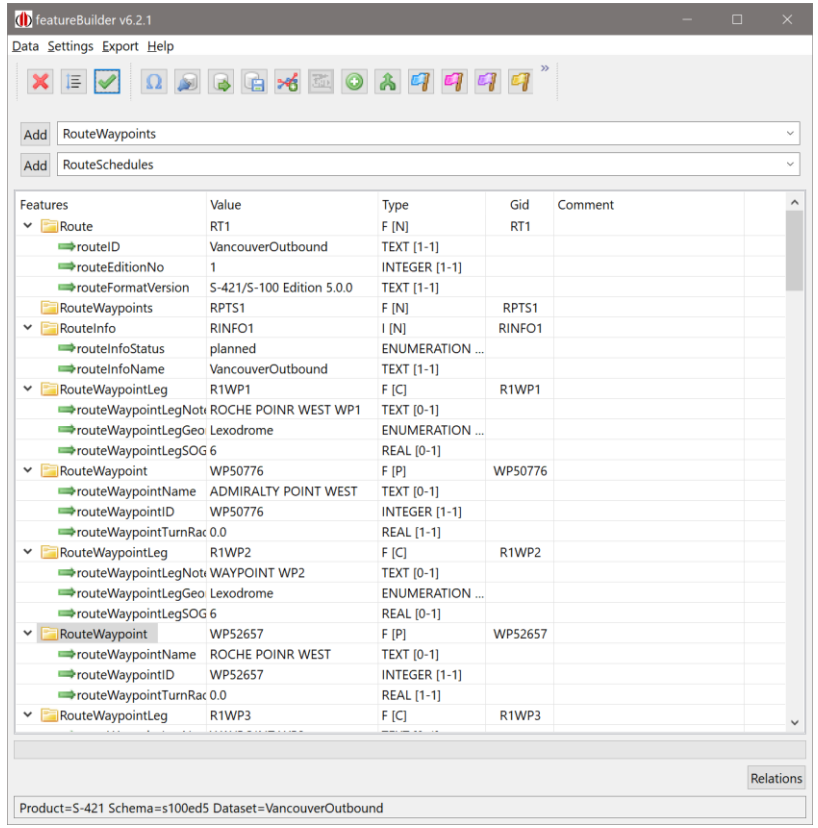




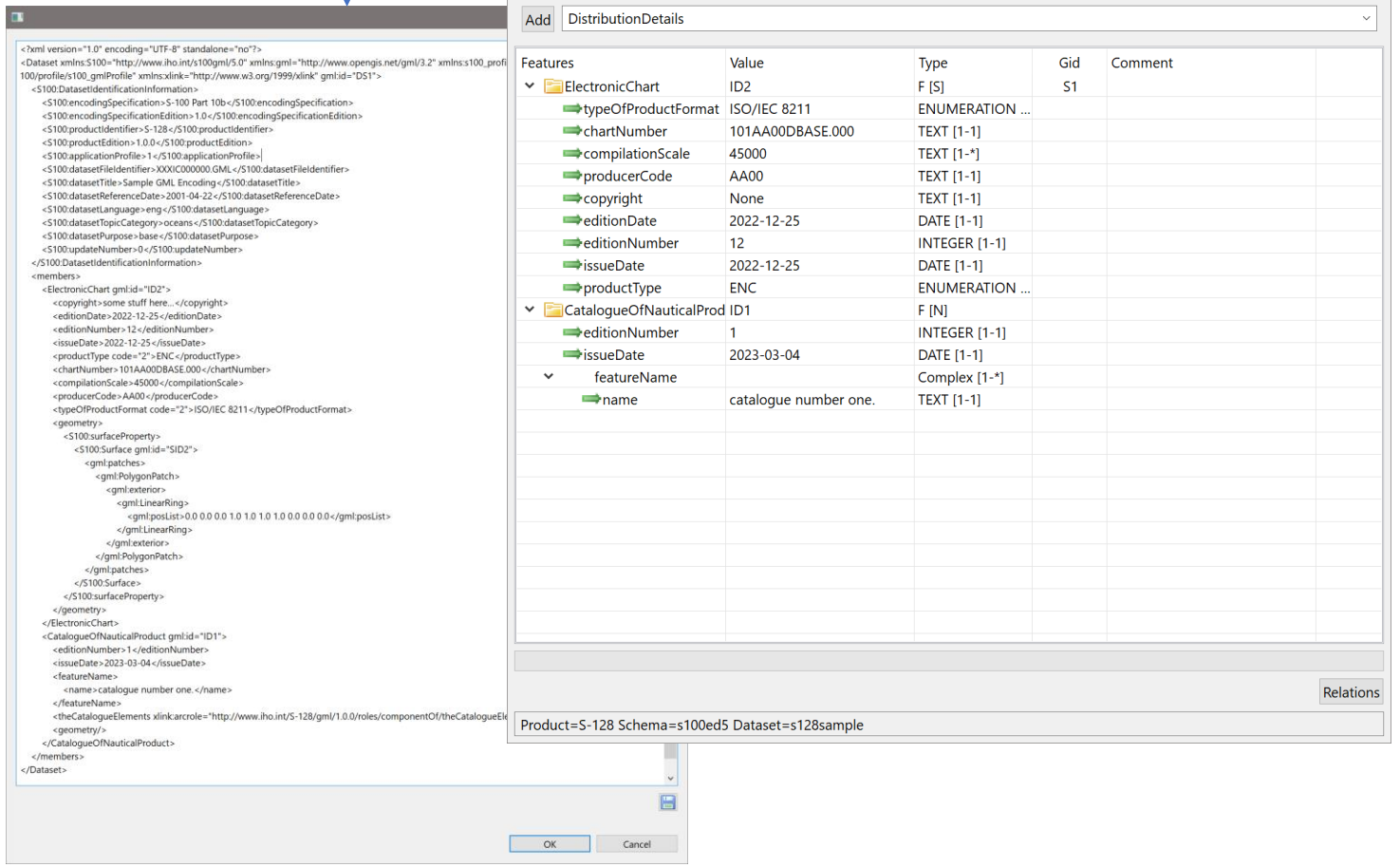




Auto-Generation

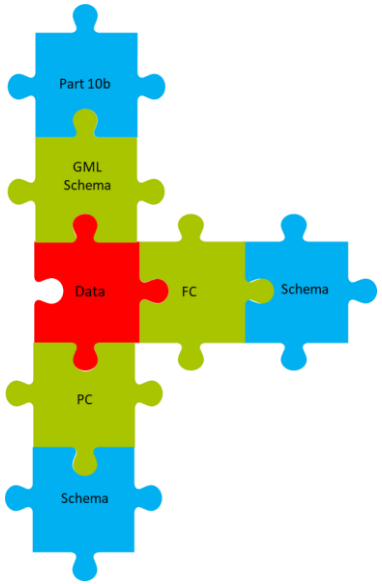


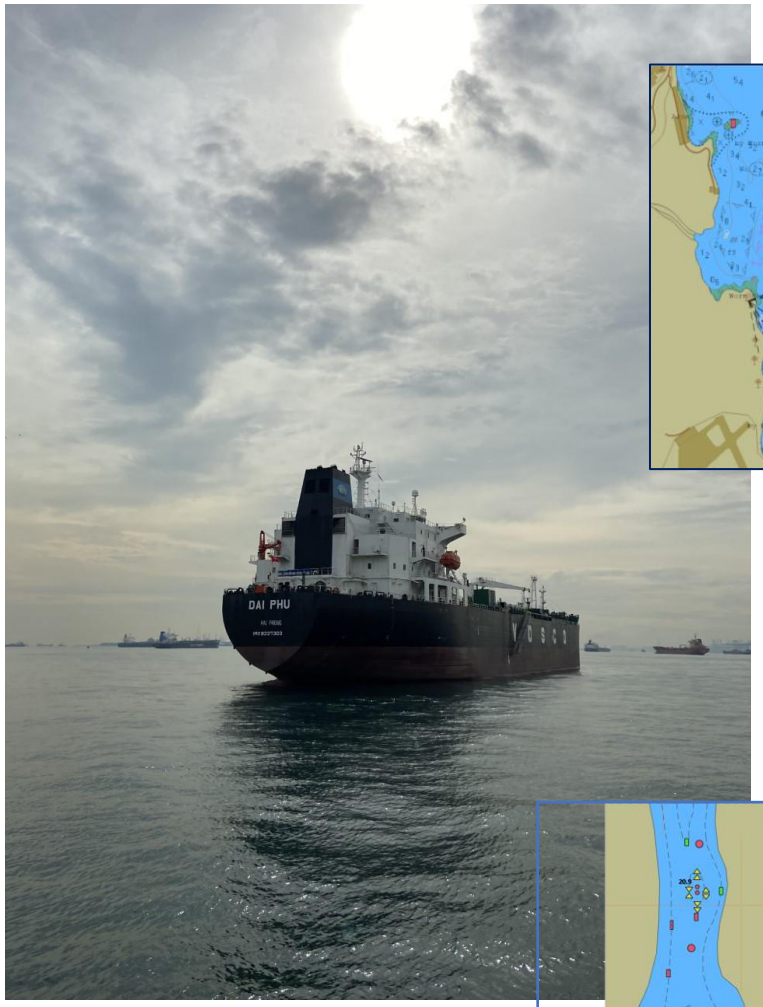
S-128 Metadata

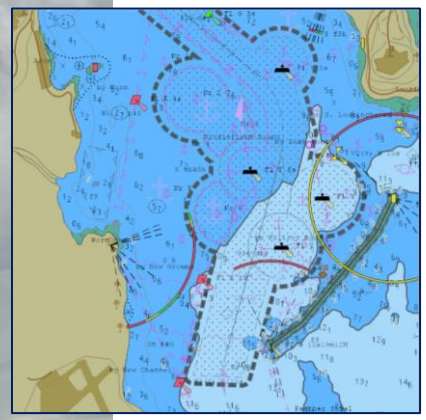


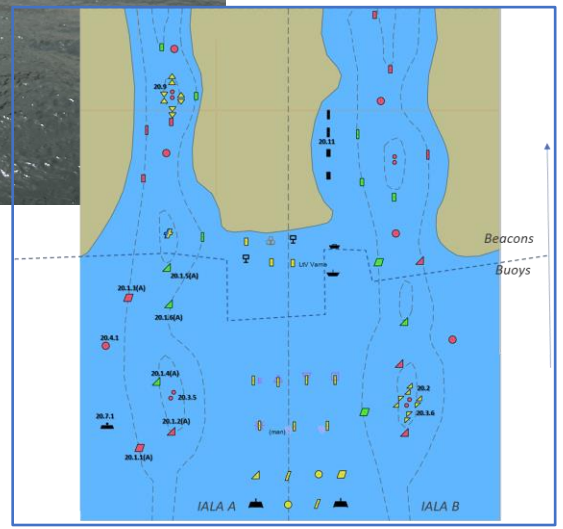
What's on the horizon?

- We are focusing on making S-100 simpler to understand and implement
- Simpler to integrate with existing data sources, either to replace or sit alongside legacy databases
- Streamlining creation and validation of usable, interoperable data from feature catalogues
- Supporting the OEM community with
  - Creation of S-164 test datasets
  - Exchange Sets for S-164 (including S-128)
  - Refining the S-164 documentation
  - Clarifications/Corrections to S-98
  - Test datasets for S-101 (and others)





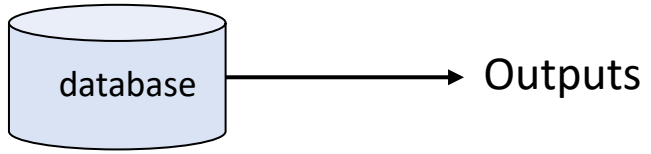


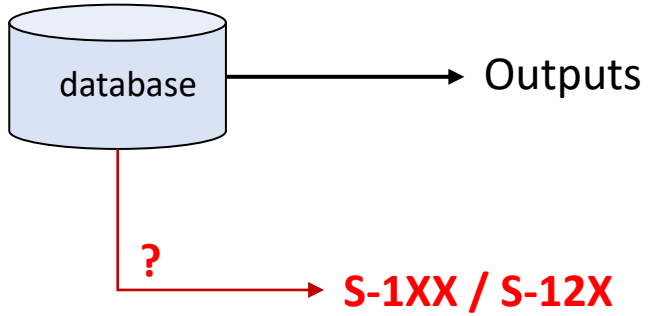


We need help!

Conversion and Transformation?

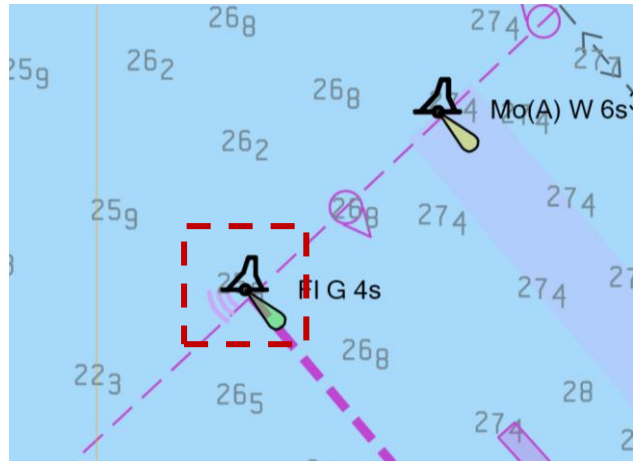
- “How do I migrate my existing legacy database to produce future S-12X and S-1XX products”?
- Can I produce S-12X, S-12Y and S-1ZZ from a single database ? What does that database look like?
- What do I do when the product feature catalogue changes?
- How do I know my migration is “complete” and “conformant”?
- Are my outputs consistent with each other?





Data Transformation Framework

- Transform from FC to FC and dataset to dataset
- From/To relational databases
- From UML to FC

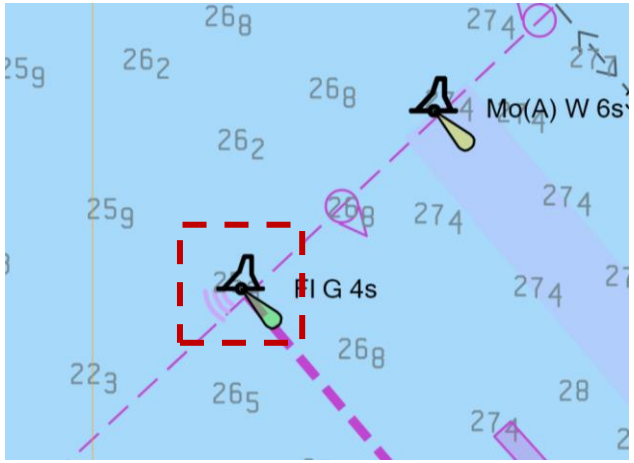


Consider an Aid To Navigation

- Charted by Hydrographic Office (category, colour, topmark etc..)
- Maintained through another agency
  - Maintenance regime
  - Contact details
  - History
  - NMs

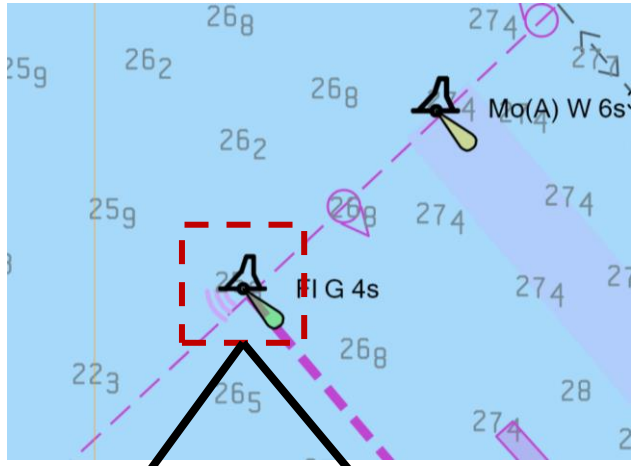
- S-100 implementation could be S-201 or S-125 production
  - Continue legacy database?
  - Create new database?
  - What about bespoke database

- **All relational (and spatial) databases can be turned into S-100 data structures either completely or partially**
- **Without some form of flexible transformation tools these problems are “significantly difficult”**



ENC “conversion” is actually a transformation from one data form to another

But we need to find a way to state how “good” the transformation is?



“where it is”

“what it is”

~~“99.86% of features are converted”~~

For 100% of locations, all features are defined by an unambiguous, independently defined mapping.

…including updates

BOYLAT
COLOUR
TOPSHP

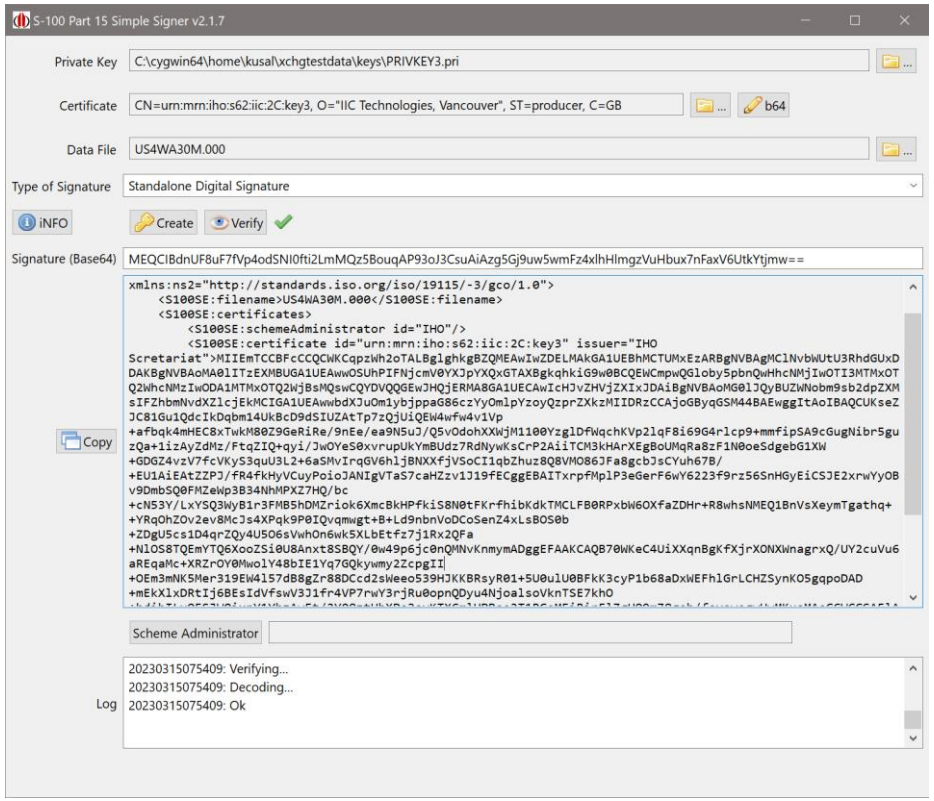
converts to

derived from

Buoy Lateral
categoryOfLateralMark
Colour
TopMark

“everything is somewhere…”

Digital Signing of Datasets



- Replacement to CRC32 algorithm for ENCs
- Standalone application for creation of digital signatures
- Requires a private key and certificate
- Creates digital signature XML which can be included in an S-100 edition 5.0.0 CATALOG.XML or sent separately as a standalone signature
- Verification of received dataset against signature and certificate
- We're looking for testers
- Free for data producer use
- Contact jonathan.pritchard@iictechnologies.com
- https://tinyurl.com/4vhprcj7

S-100 ECDIS Development

S-100 ECDIS is not just the implementation of more layers.

S-100 ECDIS will be an engine for:

- Handling arbitrary data layers which conform to the standard
- Conforming to the necessary standards for safe navigation
- Adding whatever value is possible for the end user.

S-52 was such an engine (“.dai” files) but S-100 is a step change in complexity. This requires a new approach.

“.dai” files

How?

Catalogues.

“Sgt Pepper broke the mould in so many ways—from concept (a “theme” album) to musical arrangements (using a full orchestra and four pianos in "A Day in the Life”) to production effects to cover art—it blew the roof off of what was possible in rock music.” – Steve Jobs

ECDIS is the killer App?

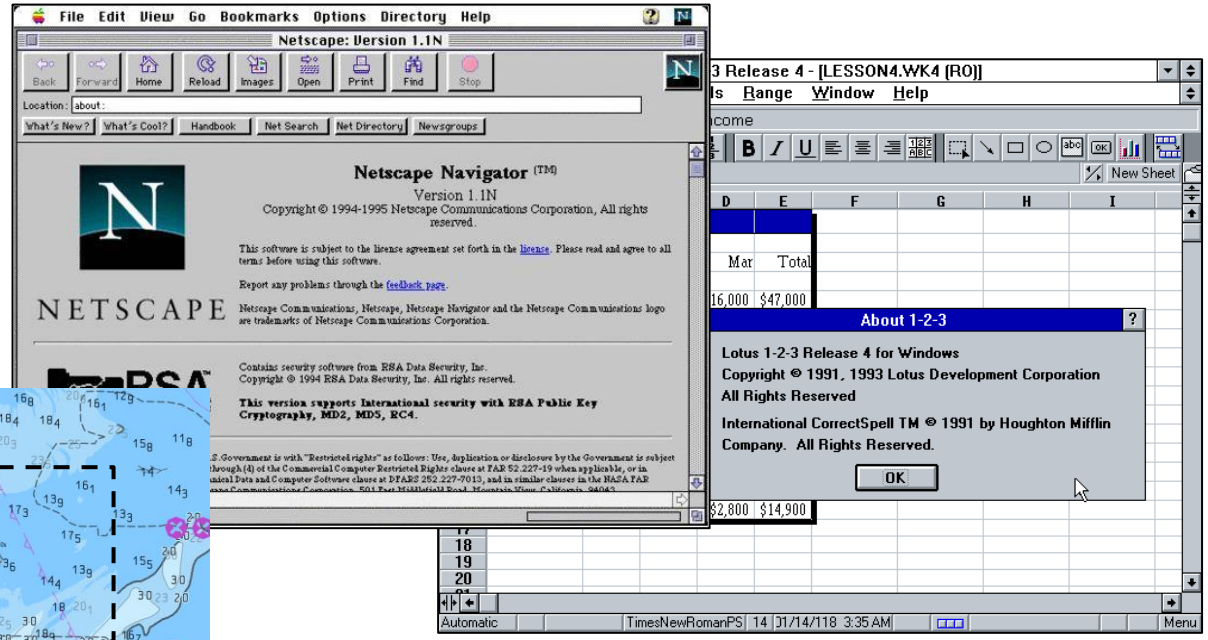
The killer app makes it all worthwhile…

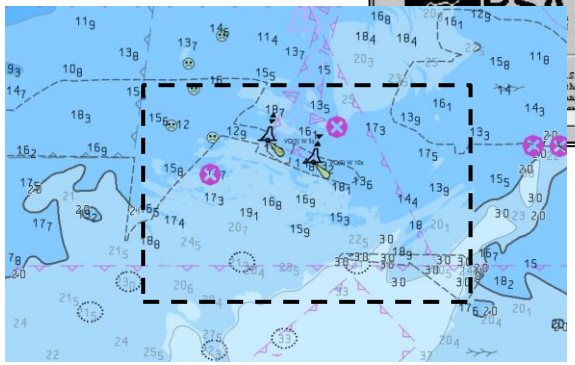
It was (and still is…)

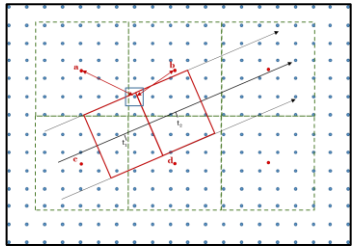
- Positional/Situational Awareness
- Automated Update
- Automated Checking
- Where is (Un)Safe for me?

S-100 ECDIS brings:

- Water Level Adjustment
- User Selectable Safety contour
- Interoperable portrayal and interrogation
- Access to all relevant data layers







S-102 + S-104

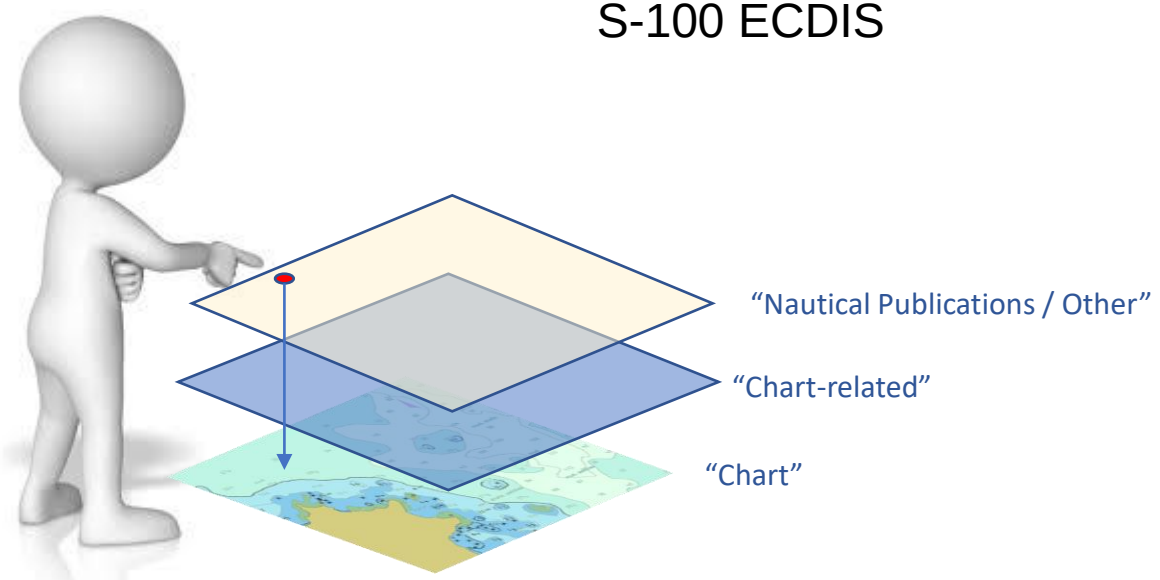
S-100 fundamentally changes what is on the ECDIS.

Single Layer official S-57 ENCs are replaced by multiple, interoperable layers of navigational data.

The deeper question is how to integrate the other data.

Accessibility to other kinds of information via structured data, accessed “spatially” using links within the features.

S-100 ECDIS



What’s here?

What’s important to me?

3.5 Local Vessel Traffic Services (VTS) Zones

With respect to the VTS zones specified in the Vessel Traffic Services Zones Regulations, these regulations apply in respect of:

a) every ship 20 metres or more in length;

b) every ship engaged in towing or pushing any vessel or object, other than fishing gear, where;

   i. the combined length of the ship and any vessel or object towed or pushed by the ship is 45 metres or more in length, or

   ii. the length of the vessel or object being towed or pushed by the ship is 20 metres or more in length.

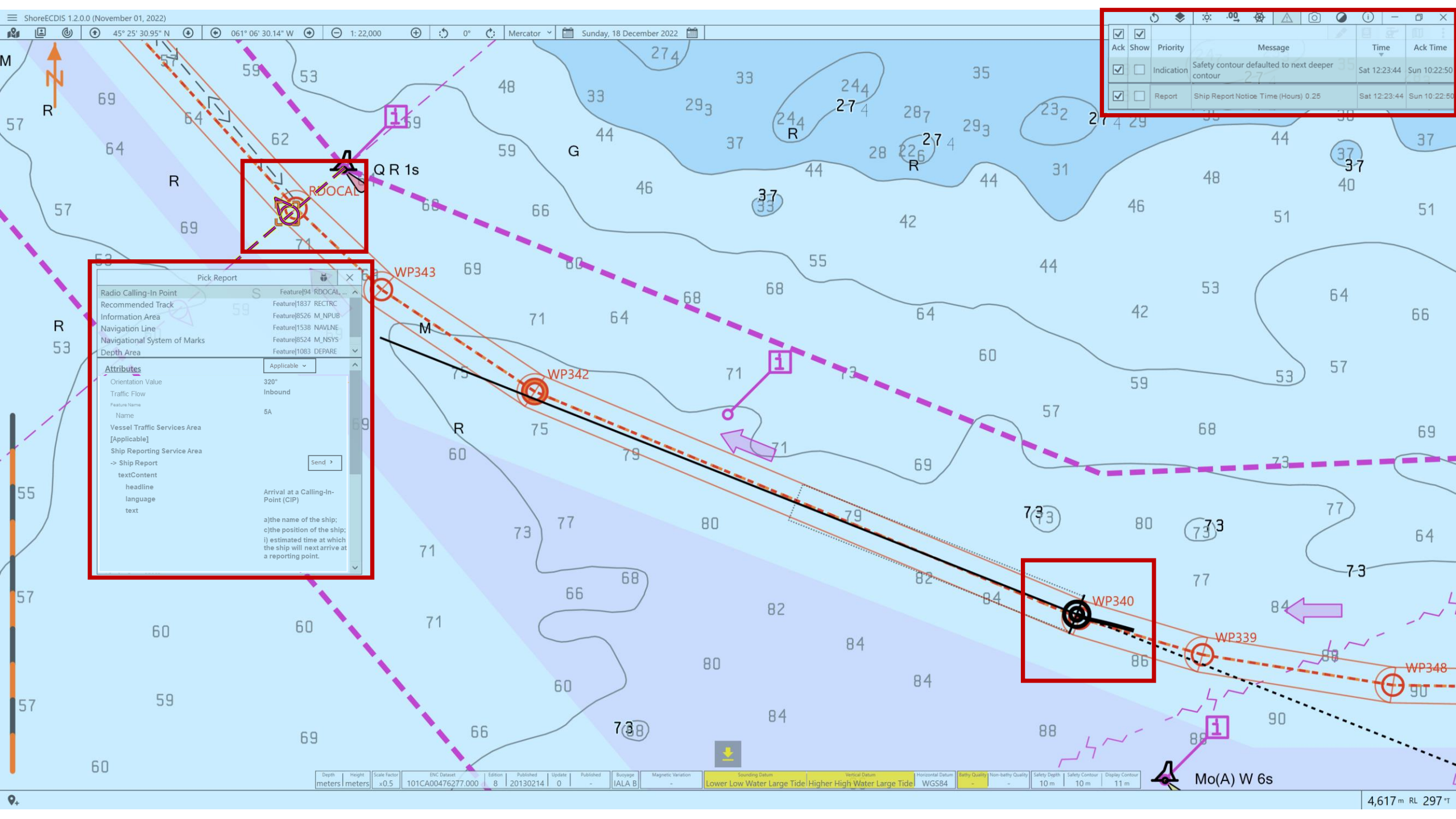
With respect to the VTS zones specified in the Vessel Traffic Services Zones Regulations, these regulations do not apply in respect of:

a) a ship engaged in towing or pushing any vessel or object within a log booming ground;

b) a pleasure yacht that is less than 30 metres in length; and

c) a fishing vessel that is less than 24 metres in length and not more than 150 tons gross tonnage.

Participation is mandatory.


ShoreECDIS 1.2.0.0 (November 01, 2022)
45° 25' 30.95" N
061° 06' 30.14" W
1: 22,000
0°
Mercator
Sunday, 18 December 2022
Ack
Show
Priority
Message
Time
Ack Time
Indication
Safety contour defaulted to next deeper contour
Sat 12:23:44
Sun 10:22:50
Report
Ship Report Notice Time (Hours) 0.25
Sat 12:23:44
Sun 10:22:50
Q R 1s
RDOCAL
WP343
WP342
WP340
WP339
WP348
Mo(A) W 6s
Pick Report
Radio Calling-In Point
Recommended Track
Information Area
Navigation Line
Navigational System of Marks
Depth Area
Attributes
Applicable
Orientation Value
320°
Traffic Flow
Inbound
Name
5A
Vessel Traffic Services Area
[Applicable]
Ship Reporting Service Area
-> Ship Report
Send
textContent
headline
Arrival at a Calling-In-Point (CIP)
language
text
a)the name of the ship;
c)the position of the ship;
i) estimated time at which the ship will next arrive at a reporting point.
Lower Low Water Large Tide
Higher High Water Large Tide
WGS84
4,617 m RL 297 °T

Thank You.

Questions?

jonathan.pritchard@iictechnologies.com