

**Paper for Consideration by WENDWG14****Expectations from Mariners and End-User Service Providers on ENDS Provision**

**Submitted by:** ChartWorld Group (Teledyne)

**Executive Summary:** This paper is aimed to spark a lively discussion amongst industry, RENCs and Member States. It provides some innovative ideas and viewpoints on the necessity to revolutionise the distribution and data value chain for the provision of data for navigation in both SOLAS and non-SOLAS markets. We aim to encourage productive steps in the WENDWG in making ENDS provision a reality in today's market.

**Related Documents:** N/A

**Related Projects:** N/A

**Introduction/Background**

ChartWorld are a well-established VAR in the existing landscape in terms of data delivery and ECDIS, as well as maritime software applications to handle such data. Now within the Teledyne Group of Companies, we have a much wider scope upon which to draw from experience and a variety of end-user groups. The focus of the end user service provider is to set the expectations of the Mariner. An issue we are finding is that the expectations of the end user service provider in terms of ENDS provision varies extensively.

This is largely due to the fact that the task for the development of new S-100-based product distribution methods is very interesting and gives a lot of freedom for inventing an ideal world. BUT that freedom also has to potential to lead to creativity overdrive versus the reality we face.

We would like therefore to start by outlining a general idea and can continue defining a more practical approach after what we hope will prompt, lively discussions.

Basically, electronic (nautical) data service for the marine industry comprises four main parts: Data collection and processing; Data production; Data distribution; and Data visualisation. The main problem is that each of the four components has been developed individually, usually by different stakeholders. IHO is trying to coordinate activities and make standards for all the components, but still, solutions for each of the components are separated from each other. As a result, if one of the components is progressing, the IHO would need to slow down the progress to make the solution compatible with other components.

Example: Modern multi-beam survey solutions could easily collect HD bathymetric data in a digital form, which could go directly to vessels. However, at the next step, the HD data is generalised and downgraded to old fashioned ENC data that was designed based on the paper charts - a rectangular cell of a certain scale and defined level of details. And this downgrade is required because the vessel ECDIS is designed to support the cell-based files of different "compilation scales."

We would like to outline our views on how and why this approach needs to change in the S-100 era.

**Analyses/Discussion****1) ENC Services – S-100 data processing**

Services shall not be limited to ENCs – the entire S-100 product line need to be made available; at least for Phase 1 of the S-100 product group. S-100 only partially solves the problem of the separated components of the data service because it must consider the design of the visualisation systems and most

likely due to the S-100 framework being based on a classical mindset. The ideal solution for the above issues would be to tie all the components together and provide the best-integrated data optimal for use in a modern visualisation system.

Basic postulates for the integrated solution are the following:

- All source and raw data effecting navigation are stored in a central database at HO or data producer level. All S-100 products derived from such database should be consistent. For example, Navigational Warnings should be consistent with ENCs. Another inconsistency was highlighted in the paper discussed earlier in this workgroup, whereby the coding of Restricted Areas differed between different data producers and in some cases different charts from the same data producer.
- Data production tools should connect to the database and process different data layers, making them consistent and validated. In general, one real-world entity should be presented by one item in the database, or several complementing but not duplicated items. All the items are stored in the central database.

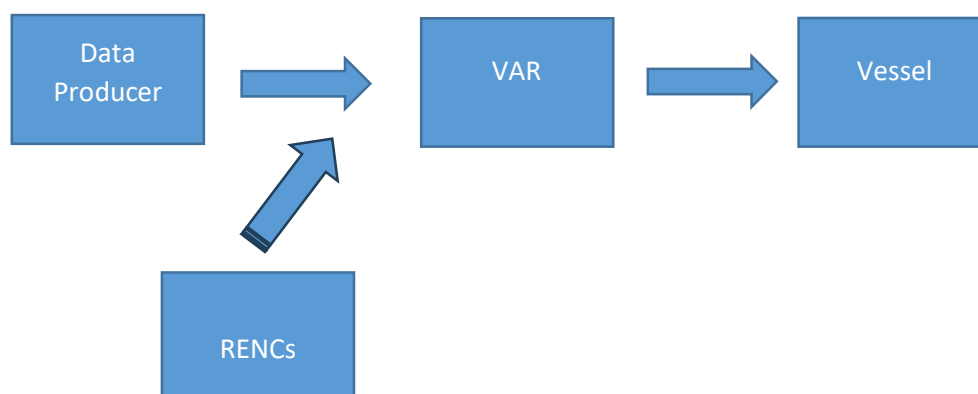
## 2) Provision and Distribution Methods

In general, data distribution should connect to the central database described above and process requests sent directly from the vessel's visualisation (or planning) system. For example, by receiving a route, the system extracts required items from the central database (by geographical polygon and other criteria) and delivers consistent data to the vessel's visualisation system.

All data should be provided by a "Pay-per-Polygon" license approach with unified rules. And current limitations of today's Pay-As-You-Sail licensing model need to be addressed. For example:

- Non-PAYS areas cannot exist. Data requisition from the central server is performed via geographical polygon.
- Data use onshore (other than navigation) needs to be available, and practical!
- All data should be technically available with no license limitations or complicated dependencies.

RENCs and VARs are to remain in the picture to deal with quality, support etc.



We strongly believe that this example configuration provides the best-case data delivery to the end user. If you look at an alternative method – the Marine Connectivity Platform (MCP) – we have doubts. Who will run and support the MCP? Is it really needed? In our view it should not be the receiver of the data that

makes a choice about whether they need it or not, or how it should be used. Eventually, ECDIS will be able to tell the end user what they need. In between, the VAR can do what they are supposed to do and add value to the data they are reselling but customising by voyage to end user needs. Although communications at sea are vastly improved nowadays and no longer an issue, it is more the volume of data that will potentially be available to the bridge that has to be validated and risk assessed for best use for a specific voyage that IS the issue. This takes time and costs money – both finite resources for end-users. In the end, we (VARs/End User Service Providers) are all MCPs to a degree, running our own public platforms.

SECOM implementation is another delivery vehicle we see having many issues:

- It is difficult to implement technically for all data providers. Going from Hamburg to Singapore for example, a vessel would get data from 20+ data providers.
- There will be very few S100 ECDIS in the field from 2029 – it does not constitute a solid business case as the majority would still be a legacy ECDIS without SECOM capabilities.
- SECOM being part of the ECDIS Performance Standard for data distribution and IEC 61174 ed. 5, means a relevant test (and infrastructure) must be a part of S-164.

### 3) Expectations, Update Routine

- ECDIS and high-end Sub-ECDIS can officially use an approved protection scheme (like today with S-63).
- The vessels visualisation system is prepared for processing consistent data and provides the best visualisation depending on the users' tasks (e.g., different displays in planning and monitoring modes).
- Update routine should be event driven. Allowable latency for data distribution and for data validation for consistency with the end-user system.

### 4) Liability

Issue remains unchanged – HO should in theory, stay liable for the content.

Data Producer is liable for the data.

The VAR could be liable for the end service BUT product liability insurance should be common across the field and must be standardised.

### 5) Product Expectations

Pricing as now will not work on low-end sub-ECDIS market. Today it is for 50,000 SOLAS vessels with ECDIS. If it is available and used by five million vessels then the data price for the low-end sub ECDIS must come down in order for it to be accepted by end users, thus used and the revenue of HOs can be increased.

Phase 1 product expectation for ECDIS to digest with event driven updates.

### 6) Data Value Chain Expectations

Here is something controversial – provide S-100 data for free. Free? A VAR optimises for safety and charges the vessel a fee by route, not for the data, but for the delivery of the service. If this idea is

considered, it would also better enable SECOM implementation (Amendments to MSC.530(106)) with regards to minimum required functionality relevant to route transfer only.

One issue with this from an end-user perspective, is that without an incentive for vessels to use S-100 data they most likely will not unless they are mandated to do so. Besides the availability of S-100 products this should also be supported by a clear legislation "carriage requirements" for all relevant S100 products. If the choice is left to the vessel/owner, then only 1 of 20 at best would be paying/buying products other than S-101 (ENCs).

HOs are of course interested in providing the best actual data for the safety of navigation. In addition to this they also have a requirement to provide a return on investment and charge for the data they produce. If the data is sold and charged in pieces (per each ENC cell) there is a risk that not all the data is purchased which in turn compromises the safety. Therefore, the best approach would be to deliver all the best data to all vessels without a need to select or count or charge per ENC. Then the shipping companies should be charged a "hydrographic service fee," in this way the vessels will always receive all the available data (increase safety) and HOs will receive payment depending on the number of vessels entering territorial waters (or area of responsibility) of a specific HO.

VAR Distributors (e.g., ChartWorld) would send service calls to the service provider servers with requests for data in a specified area/route corridor. There are concerns regarding data size and rendering on the fly which will need to be considered, but we believe this is manageable. Rather than compiling an outdated product catalogue with prices per data set, the compensation could be per area of interest.

NOAA is already developing a "machine to machine" / "one-stop-shop" distribution system for all S-100 data services along a given route.

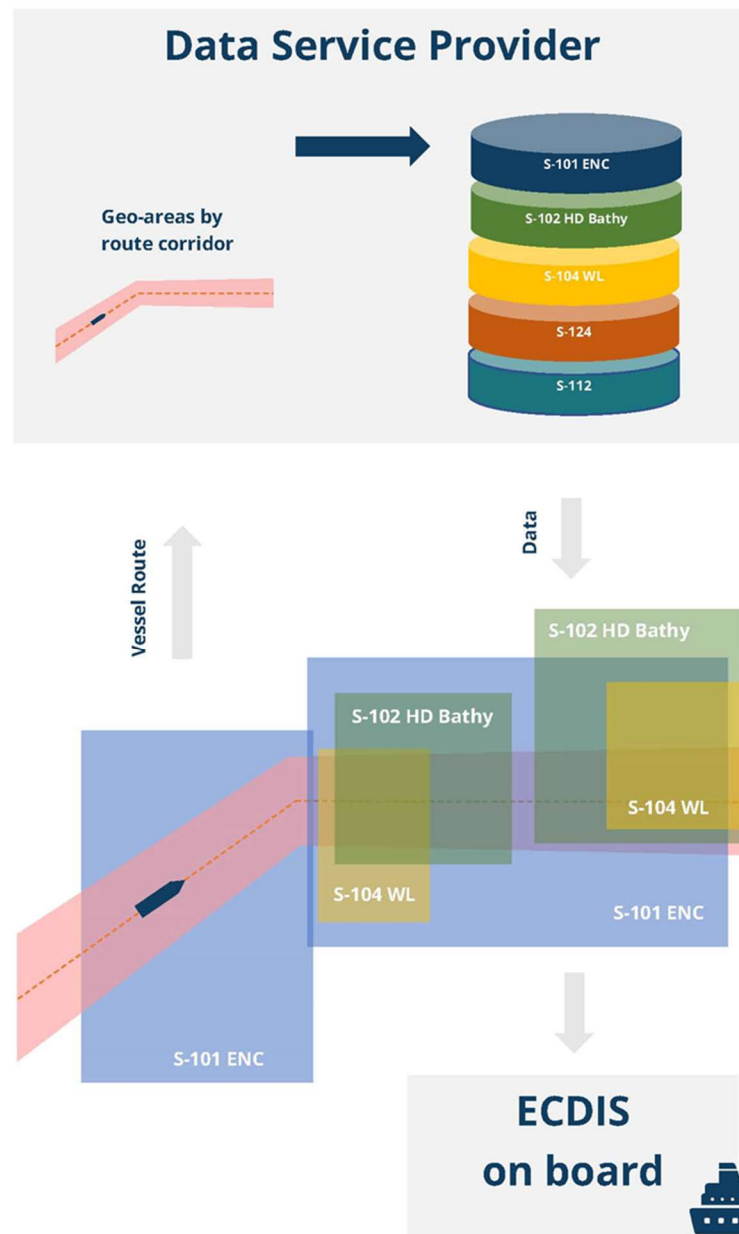
#### Shore-based licensing

The use of ENCs on shore is an aspect that was not solved with S57/S63 ENCs – not by the HOs, the RENCs or the VARs. With the S-100 suite of products these issues MUST be solved, and data provided to shore users if not for free, then at least reasonably priced and a service fee again charged. Consider these different scenarios:

- Commercial v non-commercial use?
- Navigational v non-navigational use?
- Autonomous vessels.
- Search and Rescue vessels.
- Fleet Operation Centres with a fleet of vessels already using S-100 data at sea.

#### Non-SOLAS market licensing

We also must consider the recreational (non-SOLAS) market as this is different – PAYS would not work here. We suggest a global royalty scheme by grid; the principle would be the same as for SOLAS vessels as described above, but the pricing would have to be different. Leisure would be by grid (pre-selected area) and SOLAS by PAYS (licensing global data with a charge by actual track). This charge would be part of the service fee charged by the VARs.



We have new markets to address and consider, both in terms of data producers and end user groups. We have weather agencies, port authorities, marine biology organisations to name but a few, that could and will be producing and contributing to S-100 product lines. We have Autonomous Ships who will be using S-100 data from shore. We will have a sub-ECDIS market who should have access and be able to enjoy the benefits to navigating using S-100 products.

Medium and low-end market must be handled by OEMs as to data packaging. Protection, derived products, pricing etc. OEMs must have access via RENCs to all data and have freedom to package products and pricing the way they wish. Reporting/Royalty based scheme can be applied. A liability insurance may be required to enter agreement with RENCs.

With regards to sub-ECDIS, we would strongly advise that the IMO are not involved in standardising / endorsing requirements but provide recommendations to the flag states for the S-100 data handling in sub-ECDIS. An alternative is to lobby flag states with our message but there are risks and consequences of taking this route. For example:

- If a sub-ECDIS acceptance issued by a Flag Administration 1 (e.g., Marshall Islands) – would it be accepted by a Coastal Administration 2 (e.g., UK)? It should be a world-wide recognition regime.
- If all Flag states have a freedom to setup national rules – they will of course set all different. That is already the case (USA, UK, Norway, Germany etc.)

### **Recommendations**

- When it comes to ENC services, consider the entire S-100 product line.
- SOLAS and non-SOLAS markets need to be considered.
- Data distribution should connect directly to a vessel's visualisation system.
- Introduce route-driven hydrographic Service fees.
- Maintain the roles of the RENCs and VARs.
- Consider shore-based use of global S-100 data at a reasonable price.

### **Justifications and impacts**

We see some limitations that need to be addressed by the data producers.

- Including the non-SOLAS user group leads to less control on the use of the data.
- The approached needs to be harmonised – at least at RENC level.
- Accessibility to the data in ecommerce platforms.

The approach needs to be Nationally Agreed – if not internationally. Else we end up with a very confusing licensing scheme that is not seamless for the end user. The VARs could step in here to assist with a seamless service in terms of data provision.

### **Conclusion**

If someone had said a few years back that every vessel would have to pay per voyage for every tonne of Carbon emissions using essentially tokens they purchase through an account they have to set up, and it would cost them at least USD200K per voyage, this would have been laughed at and thrown away as far too complex.

But today it is a reality. Times are changing – we have Autonomous shipping who essentially navigate from the shore-based control centres but ENCs are not designed to be used onshore.... our thinking needs to change.

**Action required of WENDWG14:**

The WENDWG14 is invited to:

- a. Note this report.
- b. Discuss this report at WENDWG14.
- c. Provide feedback on suggestions made.
- d. Encourage member states to reconsider the data distribution model.
- e. Submit a paper to IMO regarding the MCP and sub-ECDIS.