

**Future Provision of products based on S-100 based Product Specification
under HSSC responsibility**

Submitted by:	Jens SCHRÖDER-FÜRSTENBERG (Germany and NIPWG Chair), NIPWG, Louis MALTAIS (Canada and TWCWG Vice Chair), TWCWG, Hannu PEIPONEN (IEC and IEC TC80 Chair)
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Related Projects:	S-100

Introduction/Background

The replacement of printed nautical publications by a database which would be able to reproduce the content and thus, the fulfilment of the carriage requirement, is fully supported by SOLAS Chapter V. Thus, under the SOLAS Chapter V umbrella, the use of S-100 conformant NPUB Product Specifications on board is fully supported.

During HSSC6, NIPWG's predecessor SNPWG raised the question of the future provision of S-100 based nautical publication. These questions have been recognised by HSSC but remain unresolved.

With the emerging of more and more S-100 based product specifications and the assumed provision of products based on those product specifications, the questions were addressed by other HSSC WG as well. Their request goes partly beyond the provision of SOLAS V compliant nautical information.

It has to be considered whether the well-established production and supply chain used for S-57 data can be applied for all S-100 based products or whether new production methods and supply mechanisms should be established.

Decisions should bear in mind that the current system of S-57 ENC chart delivery is widely accepted and works very well (HO => RENC => VAR => Distributor => Vessel). Similar to the current S-57 data provision and distribution, the direct contact between hydrographic offices and their customers is no longer possible in the S-100 environment. However, the current version of the data supply of S-57 ENCs, their updates, auxiliary data and S-63 provided up-to-date information has been successfully applied in the existing delivery systems.

For SOLAS vessels it is fundamental that data producers keep the control of their data. This is the driving force behind interoperability.

Therefore, a whole review of the supply chain should be initiated. As part of that review, the S-98 Interoperability Specification should be taken into account as well as the fact that the supply chain should be generic enough to support the provision of all S-100 based product specifications. The review should also consider new data provision mechanism, such as web map services.

Analysis / Discussion**1. Availability of production tools**

The discussion based on the assumption that sufficient production tools are available and they are able to manage S-100 based product specifications. A second necessary assumption is that HOs will be able to produce products based on these S-100 based product specifications in a reliable way and that an update mechanism is available.

This includes the ability to produce updated data and to distribute it to those users who have the old data. Systems utilizing the old data must have the technical capability of replacing the old data with new data.

This process should be holistically described so implementers can design systems capable of managing their part in this update process, and in sum create a full update mechanism. A piecemeal update

specification is not appropriate as this may result in too many different update processes, which would be impossible to control.

2. SOLAS V, Replacement of printed products

Considering that agencies/offices do not provide all nautical publication information in a harmonised way, it should be discussed with the Member States which nautical publication products or set of products will replace which printed nautical publications.

It is suggested to discuss that issue at the Regional Hydrographic Commission level and it should be considered if the RENCs could be used as an additional discussion platform.

In the S-100 regime it is assumed that carriage requirement of the paper chart and nautical publication is fulfilled with digital products. Many of these products will be used in parallel in an ECDIS – especially during route planning (route planning is a fundamental function of the ECDIS as specified by IMO).

3. Applicability of WEND principles

The current production and provision of S-57 data is managed in accordance with the IHO WEND principles. The WEND principles specify that coastal states are responsible for the production of S-57 data within their area of responsibility. Open sea areas data productions are based on agreement.

Will the production of S-100 based products follow the same principles?

4. Distribution of the data

The S-57 data are being channelled through a RENC and preferably will be distributed by Value Added Resellers (VAR). The distribution of the data through VAR has never been standardised and therefore difficult and time consuming to review each solution for a hydrographic office or RENC. This is especially true if VARs are repackaging or distributing SENC data.

Will there be any validation or certification requirements on VAR repackaging or re-formatting S-100 based data?

The additional complexity potentially introduced with S-98 and the need to harmonize content across products might encourage this sort of activity.

It has to be determined whether these principles are applicable for the production of the S-100 based products. Agreeing on that, further issues have to be resolved, such as:

- What testing tools should be available?
- What level of quality assurance is expected?
- How will the data protection be managed?

GML specifications include Schematron validation rules based on the included validation checks, but logical geometric and topological consistency checks as well as exchange set level checks are difficult to implement in Schematron and will have to be implemented using other programming languages..

Moreover, RENCs and internal HO quality review generally need independent validation tools and this justifies the request of standardised testing tools.

SW manufacturers should be approached to specify the coverage, their timelines and plans to produce testing tools.

Are testing procedures for the supply chain needed? These procedures should include also the whole data flow from the producer (Hydrographic Office) to the end user application. That supply chain test be limited to SOLAS compliant systems or should be extended to GIS applications. The availability of 24/7 services should be taken into account.

5. Products outside the SOLAS market

Considering the primary objective of HOs is to provide products suitable for the SOLAS market, it has to be recognised that requests for hydrographic products outside this market will emerge. As mentioned under point 4, would it be necessary to establish similar data quality approved production and distribution ways for those products or are different aspects apply for the non-SOLAS market?

6. Implementation on board

It is assumed that ECDIS systems will be able to manage S-100 based data very soon. Which additional tests should be implemented in the IEC testing standards? Should these tests be based on a fixed version of a product specification or should they be somehow “dynamic”?

Another issue which should be addressed is how the content available to end users can be confirmed. For example, should there be some sort of an API interface that can be used to output reports or dumps of data from the display system instead of only being able to check using visual comparisons.

Interoperability checking is one of the main issues. It has to be defined whether an S-101 ENC with a great coverage is a necessary precondition before loading other S-xxx products which have been produced by Hydrographic Offices.

Is there also a need to look at the vertical coverage (e.g. are scale bands sufficient)?

7. Test of products

Before the first products based on S-100 product specification will be delivered on board, the reliability of all parts involved in the supply chain should be ensured by appropriate test standards.

- Is the onboard system compliant with S-100? What editions?
- Does the product specification comply with a released version of S-100?
- Does the product comply with the product specification?
- Does the product specification comply with the S-100 edition(s) implemented onboard?
- Who guards the guard? That means are the tests conducted according to the test standards?

Justification and Impacts

The provision of information on the intended supply chain for products based in S-100 compliant product specifications developed by HSSC WGs will strengthen the confidence on the work.

Negative impacts are not anticipated on the HSSC WGs work. Reviews and assessments of effectiveness could result in recommendations to make significant changes on the Hydrographic Offices' level. By providing a baseline for testing, stakeholders will be able to make tangible assessments of the performance of the whole supply chain.

Conclusions and Recommended Actions

It is well known that HSSC is the committee to discuss technical questions but the questions raised are going beyond the HSSC responsibility and includes operational and political matters. Therefore, and considering that HSSC is one of the two main IHO pillars, the committee should formulate an assessment of the situation and compile a report with recommendations that should be submitted to the Council or Assembly for further consideration.

Action Required of HSSC

HSSC10 is invited to:

1. take note of the report,
2. initiate actions within the IHO as considered necessary.