**Paper for Consideration by WEND-WG**
**IC-ENC and PRIMAR RENCs Position on S-128**

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| ***Submitted by:*** | IC-ENC and PRIMAR |
| ***Executive Summary:*** | For information. This paper provides the collaborative position of the IC-ENC and PRIMAR RENCs on S-128 to WENDWG13. This will support further WENDWG discussions to understand how S-128 datasets will work in practice. |
| ***Related Documents:*** | *TBC - potential Joint S-100WG/NIPWG S-128 paper (when available)* |
| ***Related Projects:*** | N/A |

**Introduction / Background**

IC-ENC and PRIMAR recognize the importance of S-128 as an essential part of S-100 ECDIS and are developing services to manufacture S-128 datasets to provide to the next level of the distribution chain (e.g., IC-ENC's Value Added Resellers (VARs)). Both RENCs have presented their proposals, to include S-128 generation in their Work Plans, to their Members, which were subsequently endorsed by their governing boards, IC-ENC Steering Committee (SC) and PRIMAR Advisory Committee (PAC). The current RENC status for S-128 is:

- IC-ENC has developed the capability to generate S-128 datasets.
- PRIMARs S-128 project is starting its first phase in 2023, planning to implement functionality for S-128 generation of the PRIMAR product portfolio by the end of 2023.

**Analysis/Discussion**

S-128 has been discussed as part of the RENC Co-operation activities.

**IC-ENC**

IC-ENC intend to produce S-128 datasets for VARs, on behalf of their Members, rather than ingest their Members S-128 datasets. The reasoning for this is that IC-ENC will generate S-128 datasets at release, to ensure accurate datasets from validated products that have successfully passed validation and set 'ready for release', and therefore any non-released products will not be included in the S-128 datasets to Value Added Resellers (VARs). IC-ENC will also not be receiving all of the products in their Members portfolios, such as paper charts.

At IC-ENCs Technical Conference (TC), this was presented for consideration, with preliminary support. As per the IC-ENC governance approach, this proposal is now being considered formally by a TC vote. The TC S-128 paper vote process will conclude ahead of WENDWG13, and results will be shared at WENDWG13. Additionally, end-user service providers will be required to create S-128 data to reflect the content of their services, and to support the aggregation of RENC data with other sources of data into seamless services, and to allow the tailoring of services to the needs of customers.

The pros and cons of S-128 generation by IC-ENC Members and IC-ENC are shown in Annex A.

**PRIMAR**

The PAC has approved the first phase of the PRIMAR S-128 project. PRIMAR regard S-128 as a key component in the future of service delivery for data to be used in S-100 ECDIS.

In its first phase, the PRIMAR S-128 project will focus on producing S-128 products of the PRIMAR product portfolio. The project is aiming for production of a complete S-128 catalogue in addition to product specific catalogues, packaged and delivered in accordance with the S-100 Exchange Catalogue model supporting the requirements in S-128 Chapter 14. Product editioning and updates in addition to the ability to extract a catalogue on demand will be investigated. Feedback to IHO NIPWG and the S-128 project team is considered essential in this project.

The second phase of the PRIMAR S-128 project will be proposed to the PAC in their 2023 meeting, aiming for project execution in 2024. In the second phase, fine tuning of the solutions developed in phase 1, in addition to further exploration of the value chain infrastructure will be conducted. Several solutions may be achieved where S-128 can be extracted directly from the PRIMAR chart catalogue interface or being harvested from an end user application using API solutions. The ability to also connect a PRIMAR S-128 information service to a Marine Connectivity Platform (MCP) may also be investigated.

A diagram illustrating the above-described phases is available in Annex B.

**Conclusions**

Both IC-ENC and PRIMAR concur that the RENCs will generate S-128 datasets at S-57 and S-1XX release, on behalf of their Members, to ensure that S-128 datasets only contain the released datasets for the VARs. On this basis, Members will not need to produce S-128 datasets when uploading data to RENCs, as all relevant information is contained within the CATALOG.XML for S-1XX datasets, and therefore S-128 datasets will not be ingested.

This approach negates the need for nugatory effort and additional complexity for RENC Members. Of course, testing and trials will be performed with the RENCs and RENC Members to prove this approach in practice. This approach will support end user service providers managing their S-100 services to their customers.

IC-ENC and PRIMAR recognize that their Members may produce S-128 datasets at a national level for other purposes. For example, an HO may choose to manufacture S-128 at the national level to incorporate all of its products, including paper charts, ENCs and other nautical products, applications for navigational purposes, online services and e-Navigation services.

**Recommendations**

See further material in Annex A & B.

**Justification and Impacts**

See further material in Annex A & B.

**Action Required of WEND-WG**

The WEND Committee is invited to:

a. note this report

b. discuss this report at WENDWG13

**Annex A – additional IC-ENC supporting material**

IC-ENC and PRIMAR intent is for the generation of S-128 datasets for release to VARs to be performed by the RENCs.

**IC-ENC position**:

IC-ENC will generate S-128 datasets for inclusion in S-57 and S-1XX exchange sets, as shown in the diagram below. The intention is for S-128 datasets to eventually replace the existing Catalogue.txt for S-57 exchange sets. S-1XX will be supported by S-128 datasets on a product type basis, for the VARs to package the data as required, as showed in the diagram below.

The option to extend the capability to produce a delta version of S-128 datasets will be explored with VARs to ensure optimum information is provided.

IC-ENCs intent for S-128 is to provide accurate S-128 datasets with their Members released datasets to VARs, which contain only the datasets that are released. VARs will use IC-ENC S-128 datasets as source information for their S-128 datasets for their customers.

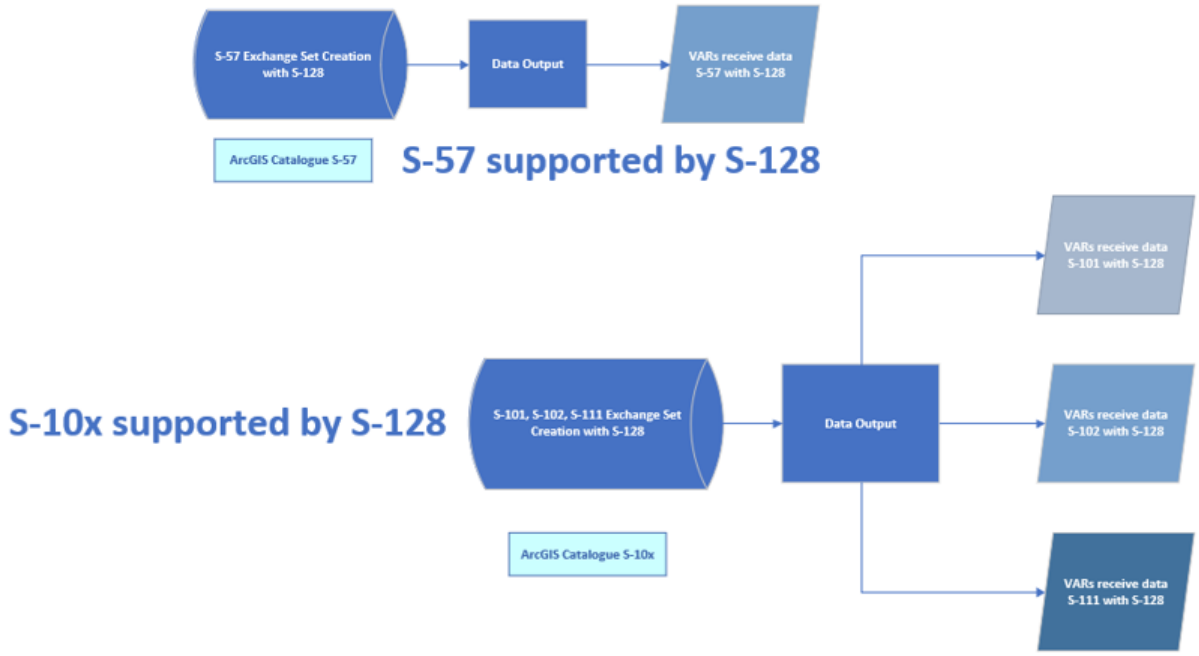


*Fig 1 - S-128 process flow for IC-ENC release of datasets to VARs*

The rationale for this approach is shown in the table below:

| Members S-128 | | IC-ENC S-128 | |
|---|---|---|---|
| **Pros** | **Cons** | **Pros** | **Cons** |
| Fulfil national Catalogue requirements | Additional burden on HOs to produce extra datasets when submitting data to IC-ENC | DMD capability to generate S-128 datasets from validated products set 'ready for release' | n/a |
| Fulfil requests from national Port State Control | Additional development of DMD required to ingest, register, validate and process S-128 datasets for no benefit | Accurate S-128 datasets from validated products set 'ready for release' included in exchange sets provided to VARs | n/a |
| Provision of information to IHO Secretariat (INToGIS) | RENCs will not receive all of the products in S-128 | Provision of S-128 datasets to Members to reflect their released datasets | n/a |
| Support US publicly available data | n/a | Source for IC-ENC graphical catalogue | n/a |
| n/a | n/a | Replace Catalogue.txt for S-57 with machine readable S-128 datasets | n/a |
| n/a | n/a | Support end user service providers managing their S-100 services to their customers | n/a |
| n/a | n/a | Provide feedback to IHO NIPWG/S-128PT | n/a |

*Fig 2 - Pros and cons of S-128 generation by Members and IC-ENC*

IC-ENCs generation of S-128 datasets for VARs supports the following RENC requirements:

- **ECDIS requirements supported by S-128:**

In ECDIS, S-128 will provide the coverage information for given services showing users which datasets are available. In addition, S-128 will support the indication of update status of S-1XX products in S-100 capable ECDIS which is a specific requirement of ECDIS.

- **S-100 graphical catalogue supported by S-128:**

IC-ENC has developed the capability for the IC-ENC workflow tool (DMD) to generate S-128 datasets, this will provide the source for the IC-ENC graphical catalogue for S-100.

**Annex B – additional PRIMAR supporting material**

The PRIMAR approach to S-128 product generation is illustrated in the following figure:

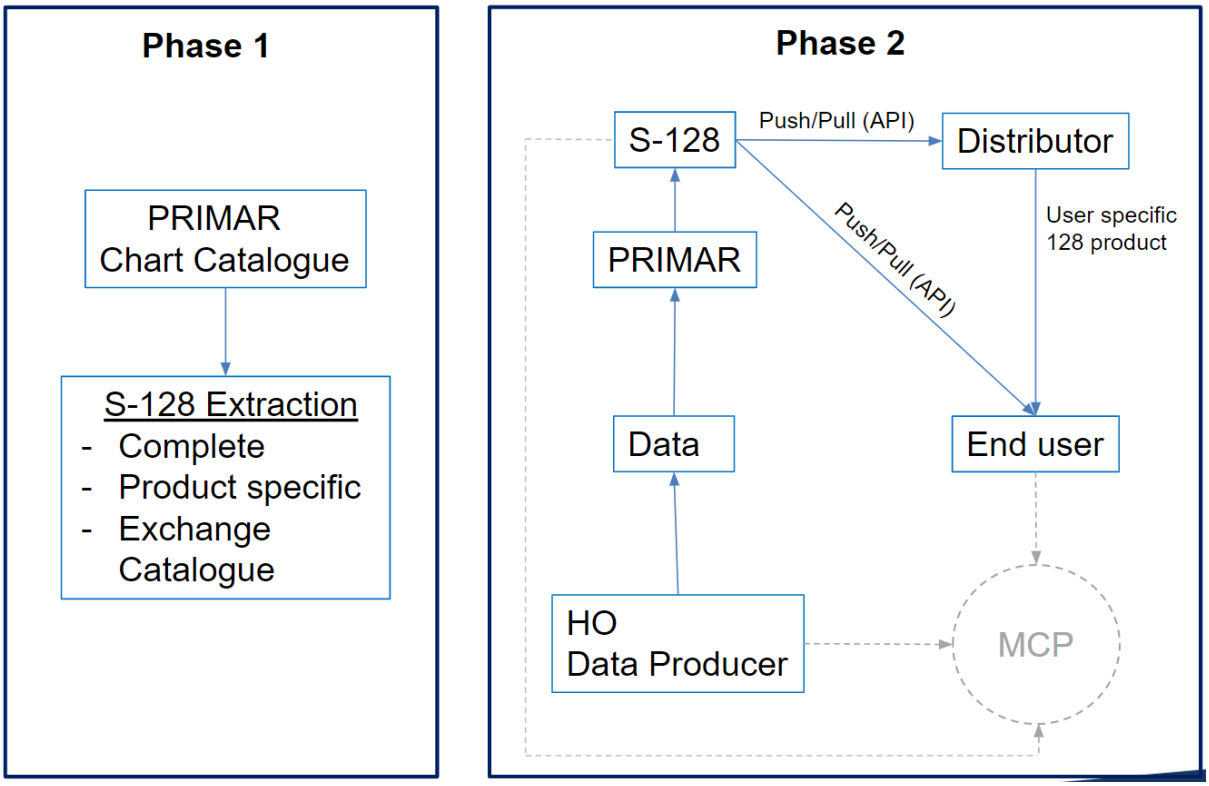


Figure explanation:

- Phase 1 focuses on production and packaging of the S-128 products, both as complete and product specific S-128 datasets. Essentially it will be a test and analysis of the existing version of S-128 capability for product generation.
- Phase 2 focuses more on the value chain infrastructure. Like IC-ENC, PRIMAR will produce S-128 dataset after ingestion into the released products database, and not be needing S-128 datasets delivered from the data producer.
    - Development of API solutions making creation and download on request possible for Distributor and possibly also End user systems will be investigated.
    - Distributor is then given the opportunity to create user specific S-128 products on their side before issuing products to end user.
    - End user system integration may also be a good solution for the Mariner and/or Port state Control to, at any given time, extract an updated version of S-128. Can be a good solution for non-SOLAS use cases (or for SOLAS use if in the future inclusion of the SECOM protocol gives direct access also to ECDIS - before such scenario becomes reality back of bridge solutions can be used for the same purpose).
    - It is acknowledged that not all ENCs or other products necessarily will be delivered through the RENC. It would then be essential to also provide S-128 datasets to entities as MCPs for further service discoverability of PRIMAR portfolio alongside other services/producers' portfolio.