

## Paper for Consideration by S-100WG4

### The Proposal to create a new ENC distribution protocol

<b>Submitted by:</b>	Maritime Safety Administration, China
<b>Executive Summary:</b>	It is proposed to create a new ENC Distribution Protocol in the S-100 Standards
<b>Related Documents:</b>	S-63、S-100、S-10X
<b>Related Projects:</b>	

### Introduction / Background

Within a geographical area or voyage, multiple sets of electronic navigational charts (ENCs) may be available from different Data Service Providers (DSPs) such as hydrographic offices (HOs), or regional electronic navigational chart centres (RENCs), or value-added resellers (VARs) etc. However, the quality, updating frequency and price of their products often differ from each other. Recently, many ENC users have reported to the China Maritime Safety Administration (MSA) that they were looking for a way to select their favourite ENC dataset from these different sources based on the “comparative shopping” principle. At the same time, the users also prefer the process of selecting, ordering, and installing of ENC from different data sources to be designed as convenient as possible; and without the need to handle the process separately for each DSP.

In 2018, China MSA in conjunction with some ENC distribution agents (agents) conducted a trail on the user's requirement and revealed that the existing ENC related standards could not meet the afore-mentioned requirements for ENC subscription service. In this regard, China MSA would like to have this service be considered when preparing the standard of the relevant S-100 products, and to take one step further, a new standard could be designed and included for this purpose.

### Analysis/Discussion

In fact, some agents have been distributing ENCs that come from multiple HOs or RENCs at the same time. Theoretically, these agents can fulfil the “comparative shopping” principle as required by the ENC users. However, as different HOs or RENCs have different ENC ordering channels and individual S-63 ENC installation packages, these agents inevitably follow the most basic process to provide their service as follows: -

- Agents would first provide the information of ENCs to users obtained from the ordering systems of HOs or RENCs;
- Users would then compare the ENCs from different sources and make subscription plan to the agents;
- Agents would then order the ENCs according to the user's subscription from the ordering systems of respective HOs or RENCs to obtain installation packages; and
- Users would finally load the installation packages into ECDIS one by one.

Obviously, this is a very tedious process and the users are looking for a more intuitive and convenient way to carry out their subscription process. They expect:

- Users could access and compare all the ENCs available for ordering in one single channel for their subscription plan, regardless of the data sources, similar to ordering through one DSP.
- The number of the subscribed ENC installation package should be as small as possible, and the number of data installations should be kept to the minimum. Ideally, the loading of the installation packages into ECDIS could be carried out in one go, similar to loading data from only one DSP.

In the course of the trial, it found that the expectation of the users as mentioned above could be fulfilled by modifying the ordering system of the agents. Agents could then provide users with a unified and simple ENC subscription interface, and order S-63 encrypted ENC from different DSPs for the users. In practice, the major obstacles we encountered were:

- Different DSPs have different interfaces for their ENC ordering systems, while some do not even have an online ordering system in place. Thus, efforts are required to design a service call program for each DSP to read and integrate information of ENC covers, chart scale, unit price, etc.), S-63 encrypted data and permits, and the exchange of ENC subscriptions information.
- All ENC data and permits from different DSPs have to be combined into one installation package. It is obvious that the current standard (mainly on S-63) does not support such operation.

## Conclusions

To address the first obstacle above, we have to follow the interface standards of the online chart ordering system of respective DSPs. We integrated these dispersed services and information into one chart ordering system of unified interface. Users could then appraise all the ENC information from different sources through a single platform and complete their subscription orders by means of route filtering and other tools. The system would subsequently split the user's order against according to data sources and submit them to the respective DSPs automatically.

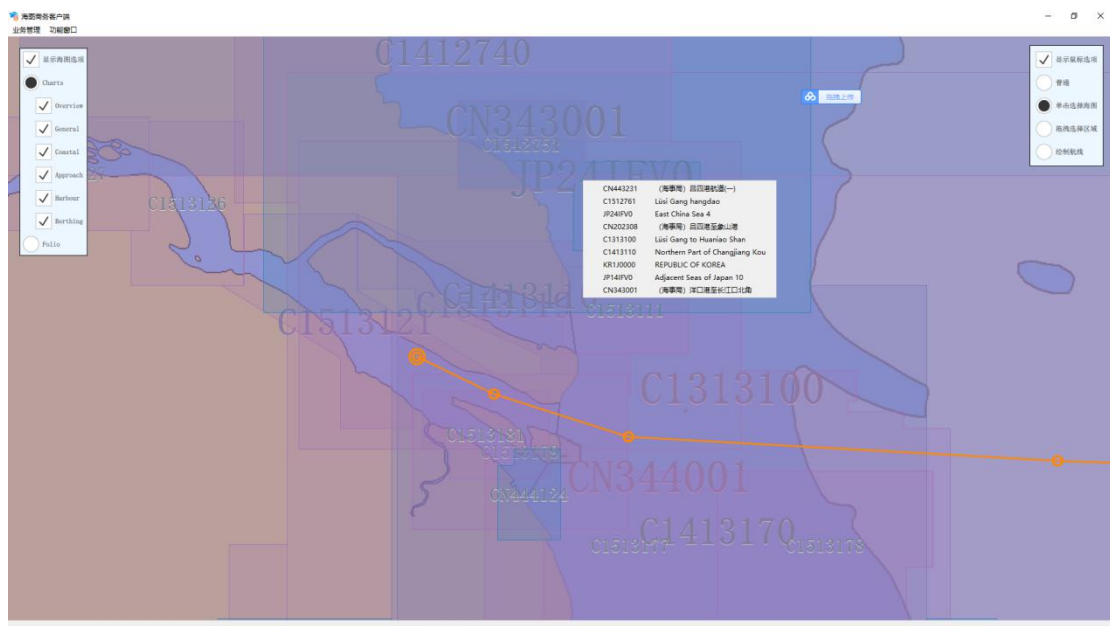


Fig.1 Integrated Multiple Source ENC Information Interface

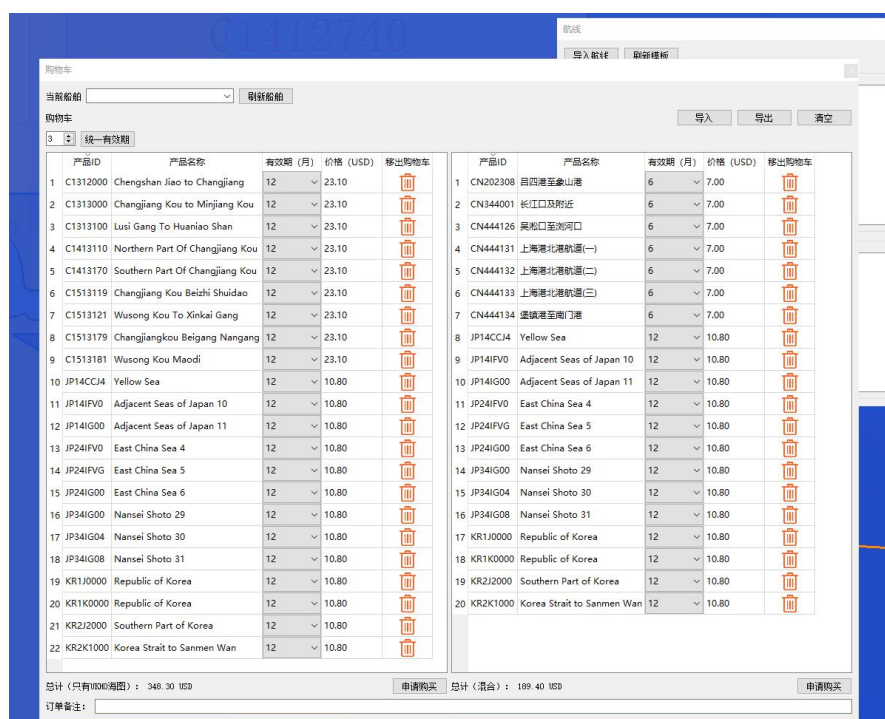
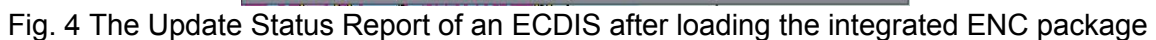
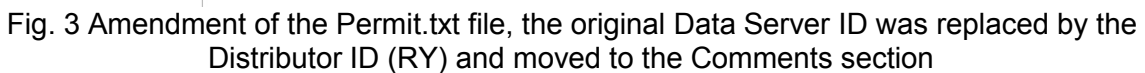


Fig. 2 – The creation of multiple orders for a voyage (left) using a single DSP and (right) based on the “most economical” criterion

To address the second obstacle, we have devised a way to integrate the data and permits from different DSPs such that the users could use the ENC data as if they are from a single source. Specifically, the method is to replace the ID of the DSPs in the “SERIAL.ENC” and “PERMIT.TXT” files of the S-63 IHO Protection Scheme with a two-character Distributor ID. The “Catalog.031” files, data sets and permits from different DSPs of the same period would then be merged without hampering the integrity of the chart data files, its signature files and the permits file encrypted portion. The processed package could then be loaded normally into ECDIS and it is backwards compatible with the present protection scheme. We believe that this approach would not undermine the copyright agreement and there are no data security risks. However, these two assumptions need to be extensively discussed.



According to the trial result, we are of the view that in order to facilitate agents to provide a more flexible and convenient service, it is recommended to establish a standard for ENC Subscription Service for DSPs. The standard should be leveraged on web service mechanism and based on the S-100 standards for delivering service to end users and agents. The possible interfaces include Catalogue acquisition interface, ENC coverage acquisition interface, user's order submission interface, ENC permits acquisition interface, ENC data acquisition interface, and the user's order query interface etc.

At the same time, we propose that when updating the S-63 standard or establishing its S-10x related standards, consideration should be given to supporting the need of merging ENC installation packages from different data sources. This procedure should be included in the standard after furnishing necessary details. It is believed that this ENC distribution method could be realized by the proposed service standard which would bring in more benefits and convenience to the ENC users and agents.

#### **Action Required of S-100WG4**

The S-100WG4 is invited to:

- Note this paper and the recommendation.