

**6th CSPCWG MEETING
IHB, Monaco, 1-3 December 2009**

Paper for Consideration by CSPCWG

**Information Paper on the Nordic Agreement to Improve Data Exchange
for Paper Chart Production through ENC's**

Submitted by:	SWEDEN
Executive Summary:	This paper reports on recommendations made by the Nordic Working Group for Developing Improved Data Exchange for Paper Chart Production through ENC's and the following agreements made by the Nordic Hydrographic Commission (NHC).
Related Documents:	Final Report IDEWG_20090327
Related Projects:	

Introduction / Background

During 2007 a working group was established within the Nordic Hydrographic Commission in order to harmonize the Nordic Paper Charts regarding structure (e.g. scales), appearance (cartography) and updating. In the final report from this working group one of the most alarming issues identified was that charts covering the neighbouring country's area were not properly updated.

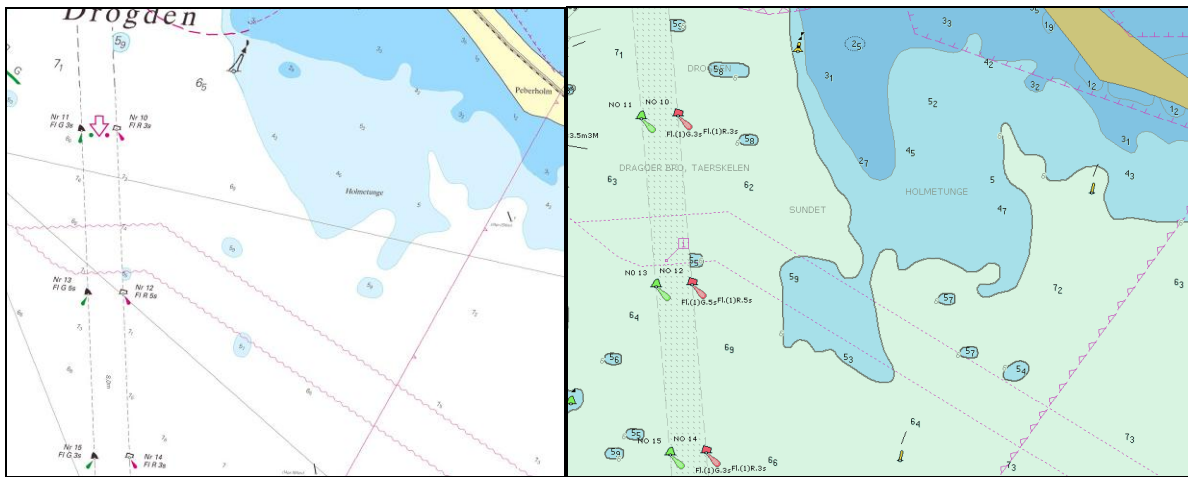
The working group from 2007 concluded that there was a need to improve the data exchange between the Nordic countries. It was also suggested that using S57-data would improve the data exchange. At the 52nd Meeting, 2008, the Nordic Hydrographic Commission decided that the Improved Data Exchange Working Group (IDEWG) should be established. This new working group was chaired by Sweden and had representatives from Denmark, Finland, Iceland and Norway. It became active in September 2008 and presented the final report to the 53rd NHC Meeting in April 2009 (NHC/53/6.2B). All recommendations made by the working group were approved by NHC and the working group was dissolved. One of the recommendations was to present the recommendations and the suggested methods in the final report to the CSPCWG.

Analysis / Discussion

Analysis and conclusions made by the IDEWG

The focus of the analysis made by the IDEWG was on geographical areas of common charting responsibility, i.e. the areas of the national paper chart that are covering another nation's waters. When discussing data exchange it is necessary to consider the fact that there are sea areas of different navigational interest and that the need for effective data exchange between countries differs. For example The Sound, the narrow strait between Denmark and Sweden, is a congested area of great importance which consequently means that the data exchange between Denmark and Sweden is in general of more importance than for example that between Norway and Denmark over the area of the North Sea where the data exchange is not likely to be as critical.

Updates in charts covering the neighbouring country's area are generally made from information published in the neighbouring country's NtM. It is impossible, however, to give a complete description of all updates in NtM. A new survey is one example of an update that could only be described in general terms. If a neighbouring country is about to print a chart over such an area then they do not have any detailed information about the survey from NtM. It could in fact take years until the primary charting country has published a New Chart or a New Edition where all details are available. During which time the neighbouring country would then have to print a New Edition/Reprint of their chart without the new detailed survey data. Hence, the method of keeping a neighbouring country's chart information updated solely through the NtM inevitably leads to the information becoming inaccurate (Picture 1). ENC's are on the other hand continuously kept up to date and the detailed survey data is available there. Therefore the working group recommended using the neighbouring country's ENC's to keep the paper charts properly updated.

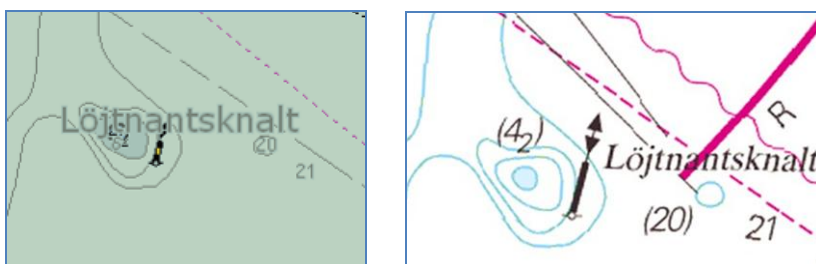


Picture 1.
The Swedish chart SE8141 compared to the Danish ENC cell shows that the depth information differs as a result of the insufficient updating method.

Within the Nordic countries when producing the first edition of a paper chart covering neighbouring countries waters the other nations ENC's are generally used. However, since the ENC data does not contain cartographic objects and attributes all cartography has to be created by the printing nation. This process is time consuming. When S-57 was originally developed one of the intentions was to use the standard for exchanging chart data between HO's for paper chart production. Therefore there are cartographic object classes in S-57 but they are not used in the ENC product profile. The working group considered if there was a need for a separate product profile within S-100 in order to take care of cartography. However since ENC data is currently the most used exchange format the working group analysed the conversion process from ENC to paper chart and agreed that the cartography for texts was a major obstacle. The working group realized that most benefit would be gained by an improved solution for text presentation.

Since the presentation of text in ECDIS is less than optimal (Picture 2) the working group believed it would be suitable to introduce cartographic text attributes in the ENC Product Specification. This would improve the presentation of text in ECDIS and at the same time greatly improve the efficiency of data exchange for paper chart production.

A proposal was put to The IHO Transfer Standard Maintenance and Application Development Working Group (TSMAD) regarding inclusion of ten cartographic attributes in S-101. The proposal was accepted by the TSMAD for further specification and inclusion in the standard. One could argue that instead of including cartographic attributes in S-101 it would be better to develop a separate cartographic product profile but since ENC's are always kept up to date it is more useful to use ENC's as an exchange format. Perhaps someone in the future would like to develop a cartographic product profile within S-100.



Picture 2
The suggested cartographic attributes would give the producer of the ENC the ability to encode suitable text placements. This is an example where the automatic text placement in ECDIS makes the navigation more dangerous than in the paper chart because the text "Löjtnantsknalt" in the ENC covers both a critical depth and the top mark of the cardinal buoy.

When charting an area within another country the major advantage of using ENC as an exchange format for paper chart production is the existence of the infrastructure provided by the RENC. Denmark, Finland, Norway and Sweden agreed a few years ago to freely make use of each other's ENC's for paper chart production. The ENC's (EN and ER) are available through the PRIMAR database and could be downloaded at any time.

There are two main aspects of improved data exchange. The first aspect is that of improved data quality as a

result of timely and descriptive exchange of information regarding updates. The second aspect is that of improvement to the efficiency of the chart production process as a result of adding cartographic information to the exchange set.

At present only a few paper charts in national portfolios use ENC as their source. It is assumed that this situation will change in the future leading to an increasing number of paper charts produced from ENCs. The value and importance of the proposed improved data exchange will increase accordingly.

In order to use ENCs and the existing data infrastructure as a basis for data exchange, one needs to know which ENCs are of interest for each nation's paper chart production. Within the Nordic countries each nation has compiled a Paper Chart Source Information List from which it is possible to see which foreign ENCs are sources for each national paper chart.

When a neighbouring country's ENCs are being used as a source for paper charts it is critical that the content of the paper chart is kept as close as possible to the content of the corresponding ENCs. This makes it possible to update the paper chart with subsequent ENC updates. In implementing the updating process it was decided that each nation should be able to produce an ENC Update Report containing information about all ENC updates between a selectable start date and end date.

Agreements made within the Nordic Hydrographic Commission

The Nordic Hydrographic Commission approved and agreed upon the following recommendations, made by the Improved Data Exchange WG, which are to be used within the Nordic countries Denmark, Finland, Iceland, Norway and Sweden.

1. National paper charts at a scale of 1:750 000 and larger that cover another nation's waters should be produced from the other nations ENCs.
2. Generalisation of the neighbouring countries ENC data should be kept to a minimum to ensure the quality and for more efficient updating.
3. Once the paper chart is based on ENCs the update should be done via ENC updates.
4. A Paper Chart Source Information List should be kept up to date by each Nordic Hydrographic Office.
5. An ENC Update Query Web Service or an equivalent query function should be provided by each Nordic Hydrographic Office.
6. If no ENC Update Query Web Service is available then it should be possible to produce an ENC Update Report on request by another country.
7. To present the recommendations and the suggested methods in this report to the IHO Chart Standardization and Paper Chart Working Group.
8. Implementation plan:
 - a. If not already available then start to collect administrative information for the ENC Update Report 1st Jun 2009.
 - b. Each country should on request be able to produce an ENC Update Report from the 1st Dec 2009.
 - c. Paper Charts should be based on the neighbouring countries ENCs according to the following time schedule.
 - i. Chart with scale larger than 1:150 000 completed 1st Jan 2011.
 - ii. Scale 1:150 000 – 1:400 000 completed 1st Jan 2013.
 - iii. Scale 1:400 000 – 1:750 000 completed 1st Jan 2015.
9. Each country to present the status of implementation at every NHC-meeting.

Conclusions

The principals stated above will be used in use from the 1st December 2009 in Denmark, Finland, Iceland,

Norway and Sweden when producing paper charts which covers a neighbour country's area.

Justification and Impacts

In connection to the comparison between BA charts and ENC's made by UKHO this year the Swedish Maritime Administration (SMA) has realized that some surveys which are published in Swedish ENC's are not included in BA charts. There are of course NtM's published by UK informing that surveys have been performed in these areas. However it could take a considerable time before the details are published in BA charts since UKHO are dependant of a New Edition of the paper chart has being published by SMA.

Countries producing paper charts over foreign waters, such as UKHO and BSH, could consider using ENC's from other countries when updates which could not be fully described in NtM have carried out.

Action required of CSPCWG

The CSPCWG is invited to note and discuss this Information Paper and consider if these principals could be used elsewhere and if these principals should have any impact on the new section B-600, Chart Maintenance, in S-4.