

## ONE OR THE OTHER OR BOTH?

# ENC or Privately Manufactured Data

The introduction of Electronic Chart Systems (ECS) and digital chart data to support these systems goes back more than twenty years to when the industry first started to realise the enormous potential of real-time navigation systems.

Pioneers such as Mortimer Rogoff, presently President of the Navigation Electronic Chart Systems Association (NECSA), had in the early eighties of the last century already embarked upon trials in overlaying radar images with very basic chart data. It was not until the mid-eighties that companies began with the production of vector chart data, notably Transas, C-MAP, Navionics and Chartworx. Some companies, like C-MAP, concentrated purely on the production of data; others, like Transas, developed both electronic chart systems and data.

This article looks briefly into the history of the development of privately manufactured data over the past twenty years, particularly in relation to the quantity and quality of this data compared with official Electronic Navigational Charts (ENC) as produced by Hydrographic Offices (HOs), and its future in the enhancement of safe navigation.

### Sources of Data

The data produced by private data manufacturers is based on official nautical paper charts as published by HOs. Many HOs also offer their data in digital format, notably S57, NTX or similar. Most HOs require that distributors pay royalties on the sales of digital copies of all charts.

### Coverage

Initially, major data producers were faced with the problem of whether to assign priority to providing world-wide coverage by digitising medium and small-scale charts, or instead to offer their clients detailed information, accepting an initial limited coverage.

Most manufacturers assigned priority to coverage followed by later filling in of detail, starting in areas decided by market demands. Again, an "ears to the market ground" approach proved to be successful. Although there were many reasons which created a situation in which the industry could take the lead in digital chart production, in contrast to the development of official navigational charts by HOs, the possibility that they could meet the requirements of the market instead of being obliged to "maintain their own garden" was certainly not the least important amongst these.

### Quality

There are only a few data manufacturers that do not claim that their data is of "high quality". Unfortunately, there are very few that quantify what they mean by "quality" or explain why they label their data as being "high quality".

Some of the major manufacturers produce data subject to rigid quality control and work with production systems certified to ISO 9000 standard; their software tools for verification, compilation and protection of data are approved by official classification bodies. It is also interesting to note that many HOs use for the purposes of quality control and validation of ENC, tools initially developed by private data manufacturers to QC and validate their own data.

However, how do we, at the end of the day, assess privately manufactured data against a standard or specification such as that, for instance, developed by the IHO for ENC? Or, going a step further, how do we achieve a (world-wide recognised) independent assessment of privately manufactured data such that manufacturers may prove to maritime authorities that, although this data may not meet IMO carriage requirements, it is reliable and therefore may contribute to enhancement of the safety of the mariner?

### Assessment Standard

In order to meet the requirement mentioned above an (international) standard for privately manufactured data has been developed over the past two years. This standard, ISO 19378, has been prepared by Technical Committee ISO/TC8 (Ships and Marine Technology, subcommittee SC6, Navigation).

An international working group to compile the draft version of the standard was established in March 2000. During working group meetings the core team was joined by several experts from the maritime world, industry and governmental organisations like HOs, Coastguards, marine safety organisations etc.

The last meeting of the working group was held in December 2002 and the Final Draft of the Standard (FDIS) was presented to voting members in January 2003. Publication of the Standard is expected during August 2003.

### Use of the Standard

The standard is applicable to both vector and raster charts. It is envisaged that national regulatory authorities may wish to require compliance with this standard as guidance for data used in ECS or other systems of electronic navigation in their countries. The Standard has been developed to make the ECS chart display as reliable as the official paper chart and its equivalent ENC. The aim of the working group has been to develop a standard easy to interpret but with content and accuracy levels at least equal to those of the ENC of the

same area, carefully avoiding, however, any over-specification or rigid structure.

## Contents of the Standard

### Contents of the Chart

The contents of the chart are very much in line with the requirements as described in S52 (Specifications for Chart Content and Display Aspects of ECDIS, December 1996).

### Quality

This covers, among other items, product specification, process control and correctness and completeness of encoding.

### Updating

This covers, among other items, the responsibility of the database producer to provide updates

### Testing

This covers the recommended methods of testing. Testing procedures shall ensure the accuracy and completeness of the entire data production process. The manufacturer may be required by national authorities or similar to have its testing procedures certified by an appropriate testing body

The standard does not prescribe a specific data format for privately manufactured data. Data producers are responsible for providing updates in their own format. A Performance Standard for ECS, including the display of data, is being developed by the Radio Technical Commission for Maritime Services (RCTM). It should be noted, however, that some flag states have also individually developed Performance Standards for ECS.

## Status

The existence of privately manufactured data is a fact of life. It is there, its volume is still increasing and it has proved to be meeting a demand of the maritime market. It is cost-effective, economically viable and it will not disappear. The major data manufacturers offer a high quality and affordable means of world-wide navigation, including an easy-to-access update service, sold through reliable global networks offering a round-the-clock service.

## The Future

There is no doubt that in the years to come the volume of ENC will increase. However, the production rate is still too slow to provide the (minimum) necessary coverage, particularly of the major shipping routes, in a (for the market) acceptable time. Moreover, it is very unlikely that ENC will ever have a world-wide coverage. In fact, it is questionable whether this is necessary.

## Filling the Gap?

In areas with no ENC coverage mariners have the choice either of using official raster data or privately manufactured vector data. No doubt the first option offers, next to the use of "official" charts, the advantage that the number of paper charts carried may be considerably reduced, whereas the second requires a full set but retains full ECDIS functionality (including the alarm functions) that can only be obtained using vector charts.

## Instead of ENC?

This option is at present preferred by several ship-owners, particularly those operating their ships globally. Although most ECDIS do support privately manufactured data produced by the major manufacturers, many users prefer (for cost reasons) ECS, particularly as many of these systems nowadays (also) meet the software requirements laid down in IEC 61174 (ECDIS Operational and Performance Requirements) and are less expensive. In this case, of course, paper charts are used for primary navigation. The time consuming (IMO) mandatory passage planning however can be done using the ECS and, where applicable, copied to the paper chart.

## ENC and the Private Data Manufacturer

As mentioned before, there is no doubt that the number of ENCs will increase with time. Although still expensive compared with privately manufactured vector data, prices have come down considerably recently. This may move the market to purchase more ENC. Most helpful will be the support of private manufacturers in acting as value-added re-sellers and in providing ENC in SENC format. No doubt they will be keen to "fill the gap" with their own data if necessary.

## Replacing Paper Charts

National authorities could consider accepting privately manufactured data meeting ISO 19379 as paper chart equivalent for certain (non-SOLAS) vessels. The Italian government has already amended the law to allow fishing vessels and leisure craft fitted with ECS (meeting the draft RTCM standard) and electronic navigational data that meets the (draft) ISO standard, to sail without paper charts in Italian waters. Similar measures are being taken in the USA.

## Conclusion

### One or the other or both?

### It is up to the market

The important aspect here is the price the market is willing to pay. Safety at sea is (and must remain) priority number one for the mariner and, indeed, also to protect the environment. A ship carrying up-to-date paper charts meets the requirements of the SOLAS convention. ECS and privately manufactured data can be used as an aid to navigation. ECDIS is not mandatory and whether this is ever going to be the case is very questionable. We are all aware that carrying ECDIS considerably enhances safety, particularly in confined waters. However, it must be affordable. This applies to the system itself but, in particular, to the chart data, as these are ongoing costs. Otherwise the market may decide to look for alternatives.