We Get ENCs… and Now What?

A historic perspective of nautical charts production in Chile over recent years is given here. The experience of the Chilean Navy's Hydrographic and Oceanographic Service may serve other Offices encountering similar problems and perspectives in facing the new challenges of modern hydrography.

In 1994 SHOA celebrated its 120th anniversary and its Director defined as one of the main goals of the organisation the development of electronic charting capabilities (1). Since 1995, the transition from paper to electronic nautical charts production has followed the steps given below:

1995: A financial calendar was approved towards realising the first Chilean S-57 ENC.

1996: 'Nautical Data International' was contracted by SHOA to receive training in ENC working processes.

1997: First edition of S-57 version 3.0 standard files were obtained and first paper charts were elaborated using CARIS GIS tools.

1998: Photo-mechanic process was modernised; colour separation was obtained directly from digital workstations, reducing by fifty per cent time required to produce originals for the printing process.

1999: An ECS platform was installed on board 'Aquiles', a Chilean Navy transport vessel. Since then, SHOA ENCs of the coasts and principal harbours of Chile have been running on that platform.

2000: Distribution and commercialisation of ENCs was initiated. A new four-floor building was inaugurated in which were concentrated all sections and labs of the Cartography Department, providing room too for a new computerised offset press system.
Also a contract was signed between SHOA and STN Atlas for the purchase and installation onboard of the hydrographic ship 'Cabrales' of a completely new bathymetry collecting data system.

2001: A consolidated production line, producing according to the long-term development programme defined five years before, came into operation.

And Now… What?
So we can say that the ship is on track. We have ENCs and a full digital process for the production of paper charts. Is it time for a rest? Of course, the answer is 'no', because some problems have been solved but several others have shown up. For example, bathymetric information collected with a multibeam echosounder at 17:00 can be at SHOA (thousands of miles away), at 17:05 ready for processing. Under this new scenario the following questions have been raised, questions to which answers must be sought not only in Chile but also within the international hydrographic community:

- How much time will it take us to process this volume of data?
- What else can we do with all this huge amount of data?
- How much error might we allow when trying to match this new information with the old?
- What will we do with the old data?

Common sense indicates that we proceed step by step, keeping an eye on tendencies of technologies to improve efficiency and effectiveness. In this regard, the tendencies are:

- Downsizing of government institutions Ã Hydrographic Offices included.
- Hydrographic Offices moving from being product to service providers. In fact, some of them have already taken that step (the Department of Land Information of New Zealand and NOAA are good examples of this)
- Between year 2000 and 2010 the tendency in global economy handling is towards growth of around 2,38 per cent. This means that maritime commerce will reach, by the year 2020, around double or triple what it is today (2)
- International tendency to handle geographic matters as a whole. This is already hitting HOs, upon which multiple forces are pulling in different directions for the attainment of comprehensive geospatial data infrastructures. If we consider how oceans, rivers and lakes cover three quarters of the planet, Hydrographic Offices are being forced to pay attention to this and other developments
- International commerce is demanding faster and bigger ships requiring now (and not at some time in an uncertain future) more efficient and secure sea-ways and ports. Given this consideration, ECDIS manufacturers will give privilege to navigation information rather than cartographic, in order to help mariners on the bridges of those ships to take faster and better decisions. Scientists are talking about the change to using increasingly cartographic data as background to the display of real-time information in the next generation of type-approval ECDIS (3)

Given these signals, the natural question for Hydrographic Offices such as the Chilean one is 'how do we have to prepare to get there?' There follow some ideas:

1. **Remodelling Organisation to Efficiently Handle Large Databases**

Much effort has gone into the making available of digital products, but only in a few cases are people looking for a good management system to handle such products in a smart way. Databases were never considered a concern for Hydrographic Offices; in fact, only countries like Canada and Germany might be mentioned as good examples of pioneering offices which have been looking for an efficient solution for at least a decade now. Nonetheless, the use of multibeam echosounders has triggered a general worry about this matter and SHOA, like several other Offices, is looking for solutions which will probably emerge from countries where the products are developed; so it is a matter of waiting to see what those countries do before proceeding further. Although we admit that this is a good road to follow, it is recommended that preliminary work on this subject is undertaken regardless of what type of database is eventually chosen. Such work will involve some unavoidable action, for example:

1.1 Study of Office proceedings and working processes. This will involve going deep inside the organisation, seeing where the problems are so as to eliminate them and, particularly, improving administrative processes that usually work against production flow. This will guide Offices towards their solution; maybe not the final one, but certainly a good one. Anyhow, in this regard the recommendation is: during the study compilation process examine what happened with other similar organisations - their experiences should help point he way to a better solution, at least in regard to aspects which do not apply to own realities

1.2 Training specialists of the organisation in database management

1.3 Co-operation with advancing projects related to hydrographic database developments

1.4 Selection and classification of old, unprocessed data to decide what to keep and which areas will have to be resurveyed

2. **Entering into E-commerce**

Make a real impulse towards e-commerce for the commercialisation of Electronic Navigational Charts, and then continue with the provision of all products and services of the Office via the Internet. Considering that legal platforms already exist, government offices, in principle, should trust in the system and give the private sector opportunities to develop this if they themselves are not prepared to provide the customer (read here the mariner at sea) with a real, good and permanent service of updated information:

2.1 Creation of ENCs Service Provision:

- Updating archives database
- Clients database with up-to-date ENCs licenses
- ENCs database
- Automatic delivery of expiring license message
- Automatic delivery of updating archives for up-to-date licenses
- In general, an intensive use of information technologies (Internet is just one more of these) to satisfy client needs both overseas and at the pier

2.2 Other Products and Service Provision:

- Scanning of all nautical publications, old ones included, to make a good selection of data in order to compile the best information for a new electronic edition of sailing directions. Modern navigation needs precision, but mainly brief information rather than the current novelistic style of these kind of publications
- Scanning of old digitalisation of products catalogues
- On-line storage state of products
- Provision of quotation service
- Provision of purchase ordering service

2.3 Users Perspective:

- Training personnel across the whole organisation to find harmony between users' needs and the reality of e-commerce, and how this will affect relations with the Office
- Use of current web-sites as permanent support for users' needs. This is a good way to meet them
- Use of web-sites to organise hydrographic and cartographic forums, handled by Office specialists. In countries like Chile these matters are not quite understood by common users, with poor results for hydrographic and nautical cartographic development. Maybe is not yet written into their missions, but this is a task for Hydrographic Offices, organisations with the best professionals to educate users about benefits in these matters
- Invite external specialists to join those forums, increasing the knowledge and experience exchange with academia, industry and, of course, other governmental institutions involved in mapping and surveying. Experience is the first quality product for the development of new and effective information systems

Epilogue

As the reader may see, most of these ideas are simply based on common sense and the analysis of technologies associated with hydrographic and cartographic environments. The aim here is to contribute to the debate concerning what Hydrographic Offices (no matter how big they might be) should do to improve navigation at sea for the bigger and faster ships that are now sailing in a more risky world.

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