

## **Chart Production System at the Swedish Hydrographic Office (NHC58 action #8)**

### **Summary**

The paper attempts to describe the history of evolution for the tools and systems used for nautical chart production at the Swedish HO (SHO). Central parts of the production environment have their roots in procurements done already in the 1980's and other very important modules are developed in-house. We are for various reasons, which will be explained, rapidly approaching end-of-lifecycle for several of these parts.

### **Background**

The move to the digital era for chart production started around 1985 at SHO. The ancestor of our present system was acquired from the then Norwegian-German company SysScan. The products concerned have over the years moved to the Norwegian company SysDeco and later to the British company OneSpatial (former LaserScan). The tools have naturally also developed over the years but parts still have the touch of early days.

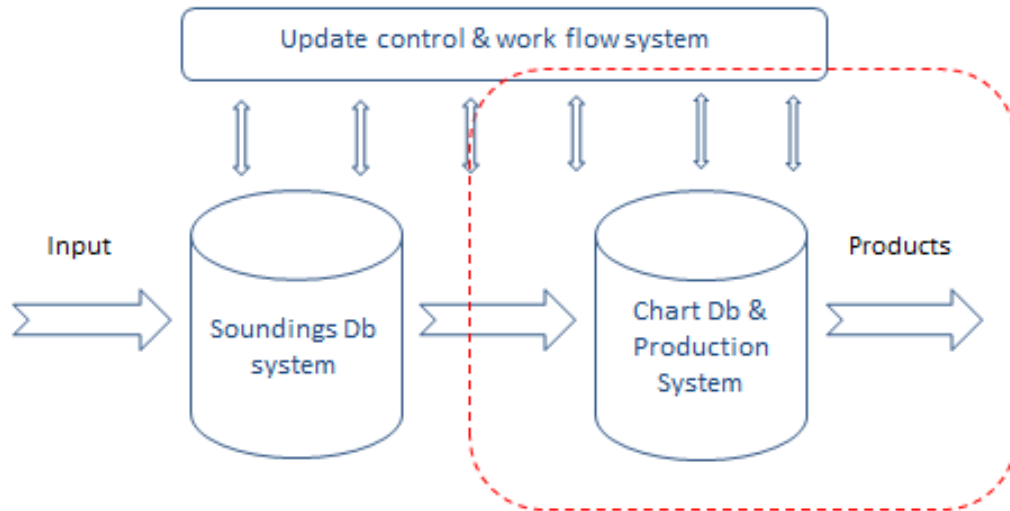
For the cartographic publishing part the system Barco Mercator (Barco, then Star Apic and now also One Spatial) has been used since early 1990's.

It is important to clarify that the vendors above really never have had any deep knowledge and expertise in the hydrographical and nautical chart domain. (They may argue against!) When the IHO standardisation of DX90, then S57, gave us the directions for digital production the development of S57 output was done with our own in-house system development resources. The production lines for paper charts, including our leisure craft chart series, were also very much developed and customised by ourselves.

The overall tool box now also contains software from SevenC's and Jeppesen-DKart for ENC verification and SafeSoftware FME for various data manipulation tasks.

The central parts, the database for chart data, the editing environment and modules for ENC output are very clearly approaching their end-of-lifecycle. Our vendor OneSpatial has declared that the tools we are using are not developed any further and this naturally makes future maintenance very difficult and risky. The system development experts in our staff that have developed crucial parts are close to retirement. Also the upcoming shift from S57 to S100/S101 is a concern and we would not want to develop such functionality in-house.

So, the need for a major renewal of the system environment for chart production is obvious and actions to start the work are urgent and imminent!!



The chart production system discussed here (within the dashed red line above) is one of three “workhorses/pillars/corner stones” in our daily operations within the office. The soundings data base system is built with ESRI software and IVS Fledermaus and other tools are in use around that database. The workflow system is web based and built using in-house system development. When we now start replacing our chart production system we will be very reluctant to introduce any major changes in these other parts but rather let them be stable during this period.

It is also worth mentioning that all the way from around 1995 both ENC and all kinds of paper charts have been produced from the same data. Data has been managed and updated for both digital and paper chart products at the same time and we have never had parallel production in this respect.

### **Advantages with the present system - hard to achieve with a new COTS<sup>1</sup> solution??**

It is evident that our present chart production system is unique, very odd and very dedicated to our production situation and that the system has evolved to fit our production processes. No doubt there are and have been a number of substantial advantages with this situation.

- We have built our own in depth knowledge in managing S57 and ENC.
- The tools for ENC, both EN and ER, production are extremely streamlined and with high performance.
- We are very flexible and may introduce new data models (object catalogues) in our system and have product output adjusted “the next day”.
- Also for paper charts the work flow is optimised and very efficient. To output any product following updates in the database is more or less a “push button“ operation.
- High flexibility and speed when designing, customising and implementing new products.

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<sup>1</sup> Commercial-off-the shelf

- For all modules developed in house the response time from suggested and approved improvements from our staff to a new version is very fast.

## **Disadvantages with the present system - not expected in a new COTS solution??**

We do expect that with a new system we have to accept changing and adjusting our processes rather than changing the system. There are also a number of disadvantages with the present system that we expect to be eliminated or reduced with a new system.

- Systems management and maintenance is costly and requires internal resources.
- All new requirements have to be developed in-house or specified and contracted to external system developers.
- We are very dependant of internal key personnel to maintain the system.
- We cannot rely on our vendor to keep track of standardisation and progress in our domain.
- There is no user community from the hydrographical domain that drives the continuous development of our present system.
- The basic capability to handle data models is outdated in present system. Complicated relations and rich data are very hard to manage.

## **The road ahead**

At SHO we have taken some preparatory steps and now also started the implementation project to get a new core of our chart production system in place within a reasonable timeframe. Initial studies have also included visits to some of our neighbours to discuss experiences and see various solutions in operation. We are grateful that there is always a very welcoming attitude among colleagues to share experiences.

Presently we are working with a requirements specification in preparation for an open procurement. At this stage we are not able to be specific about our plans and time schedule.

We foresee a stepwise approach when commissioning a new system. A supposed first step is data migration for the ENC part of the data and that the changeover to full ENC production is made from one day to the next.

There is a higher degree of uncertainty with regard to the “cartographic” extra data needed for paper charts and similar products and whether or not an automatic data migration could be successful. We expect to make more detailed plans for the re-establishing of cartographical products when we have chosen the system.

It is likely that we may report on the progress here in several upcoming Nordic Hydrographic Conferences.

## **Actions requested from NHC59**

The NHC59 is invited to note this report.