A major announcement was made this year by the International Maritime Organisation (IMO) who has set the schedule for mandating the use of electronic chart display and information system (ECDIS). For ECDIS to live up to its true potential, however, the industry must provide user-friendly and integrated ENC delivery services. This greatly depends on how the hydrographic offices set their business rules and align these with internationally agreed principles. The author explores some of the problems associated with current ENC licensing policies and describes the recently introduced ENCTrack Service.

The driving factor behind the mandated use of ECDIS is the major improvement in safety and the reduction of the risk of grounding. Many of the safety benefits of ECDIS are immediately obvious, namely, improved situational awareness, faster and more accurate updating, and reduced workload. There is also a long list of problems or challenges that have to be tackled for ECDIS to have a positive impact on safety. Coverage, availability and distribution of ENC data are high on the list of priorities. Much of the responsibility for providing coverage lies with the hydrographic offices but their responsibility does not end here.

**Introduction**

The road towards the acceptance of ECDIS has been long and challenging. Many of the standards and principles established in the 1990s were based on the state of technology at that time. A silent revolution has since occurred with the introduction of the internet and the world wide web. Everything is now connected and, as Michael Casey’s earlier articles in the October and December issues of Hydro international have clearly shown, the current and future generation of ECDIS users have a completely different expectation of technology and how it should behave. Since standards require international co-ordination and agreement, it may be almost impossible to keep up with technological developments.

**Current Licensing**

Many of the current practices for the distribution of ENCs are modelled on the method in which paper charts were (and still are) distributed: a chart catalogue is used to determine which charts are required, an order is issued to the chart distributor and the chart distributor ships out the charts to the ship. ENCs work in a similar way: the catalogue is replaced by a digital catalogue (of which there are many available), the order is sent by e-mail and the chart distributor sends a licence for the ENCs by e-mail. The advantage of ENCs is that the CDs which hold the ENCs are usually already onboard. The ship can then load the charts from the CDs onto the ECDIS when the licence is issued, removing the need to physically send any goods. However, there are problems associated with this method of operation.

**Expired Licence**

One of the problems of ordering ENCs on a voyage-by-voyage basis is the fact that ENCs do not disappear from the ECDIS when the licence expires. When an ENC cell is first licensed, the user obtains the right to install the cell onto the ECDIS and subsequently update the cell for a chosen period of time. Once this period has terminated, the cell is still visible on the ECDIS but can no longer be updated. This is only reported to the user when the update procedure is run. Usually the second mate carries out the updates and will have his own method for handling expired licences. If the expired cells are not removed, there is a significant risk that other members of the bridge team will not be aware that the ECDIS contains cells which have not been updated. If the vessel then has to divert from its original voyage plan, it is likely that it will navigate using non-updated ENCs.

**Coverage Scheme**

Another problem with the current ENC licensing is related to the coverage schemes used for ENC cells. As standards dictate that cells should not overlap and size should be restricted to 5Mb, the current schemes are not user-friendly. With paper charts, the catalogue would provide a clear overview of which charts would be required to approach a certain port. However, the picture
is not as clear with ENCs. For example, consider an approach to the port of Mo-I-Rana in Norway (Figure 1). IMO guidelines on voyage planning state: "All information relevant to the contemplated voyage or passage should be considered". But how can we determine whether information is relevant without having access to the information itself? Without having access to the actual ENC cells, we cannot determine how to approach the fjords around Mo-I-Rana. Do we approach the fjords from the north or can we take the south passage? The only option we have is to licence all the cells around the approach, only to find that a significant portion is not relevant.

**ECDIS Training**

Training is another requirement of the current ENC licensing model. In order to prepare for the mandated use of ECDIS, shipping companies face a major challenge in training their crews. There are options to follow a generic ECDIS training or a type-specific training. In addition, however, the crews will also need to be trained in ordering and licensing procedures. The process of operating a digital catalogue, planning a voyage, determining licence requirements and loading the licences onto the ECDIS requires training in its own right. This is especially true due to the many different types of catalogue software in existence, all with their own user interface and peculiarities.

The new ‘Google generation’ will struggle with these complex licence procedures. Users will expect the ECDIS to behave in a similar way to Google Earth i.e. when the user zooms in, more detail appears without having to go through a complex licensing procedure. We have come to expect the same type of service from a range of technologies. It is a challenge for the industries to provide services which answer these expectations; instead, however, they are basing solutions on the licensing terms set by the producing hydrographic offices. Better co-operation and co-ordination will therefore be necessary.

**ENCTrack Service**

In June 2009, we launched our ENCTrack service to provide a solution to many of the challenges we had faced over the years. The concept is simple: we use the existing S-63 scheme to provide permits for all available ENCs. A vessel-tracking system is then used to determine which ENC cells the vessel has travelled within, and these will be registered and charged for (Figure 2). By using this method, we remove the need for licence management and training completely. All ENCs on the ECDIS can, without exception, be updated and the mariner can use the actual ENCs to determine what information is relevant to make a passage. The S-63 scheme still has its role as charts cannot yet be copied from one system to another. The advantage of this method is that it does not require new standards, but simply the acceptance of a new business model.

**Different Approach**

Although the safety benefits of the ENCTrack scheme are immediately obvious, it has not proven to be very easy to implement. The service has been limited due to disagreement regarding the interpretation of the licence agreements. Persuading the producing hydrographic offices to allow access to ENCs for which a permit has not yet been purchased has been difficult. The new model requires some out-of-the-box thinking, as it is a radical departure from the traditional approach. We have delivered many presentations at hydrographic offices and, in most cases, have been successful in obtaining the necessary permissions. Each hydrographic office has its own operational model, however, and aligning all the offices is not a small task. The concept will only work if all hydrographic offices accept the model. It is for this reason that the worldwide electronic navigational chart database/regional electronic navigational centre (WEND/RENC) model was established.

**Concluding Remarks**

It is my strong belief that hydrographic offices should co-operate within a RENC in order to align their business rules. The ENCTrack service will not be the last of the bright ideas requiring flexible licensing policies; new initiatives such as web mapping services struggle with the same challenge. The fact that all hydrographic data are now available in a common digital format brings a world of opportunities. These opportunities require a fresh approach, however. Hydrographic offices must realise that for ECDIS to meet its promise of increased safety, the licensing policies of ENCs need to be flexible and harmonised. It is time for change.

https://www.hydro-international.com/content/article/electronic-navigation-charts