Facing the problems with ECDIS

Mandatory ECDIS is coming in 2012, a fact that has been welcomed by most in the maritime industry, particularly in the IT sector. But are we ready for the full implications of this move?
Dr Andy Norris **looks at some of the issues affecting ECDIS users**

The increasing use of ECDIS as a true replacement for paper charts on ships is uncovering a surprising lack of knowledge among some users.

It appears to be due to a combination of inadequate training and the fact that some users have yet to develop a proper ECDIS mindset, effectively treating the technology as just a paper chart on a screen.

Perhaps not surprisingly, it is the ECDIS that is generally blamed as being inadequate, rather than the knowledge of the user. The reality is that compared to the use of paper charts, present-day ECDIS offers numerous benefits.

Admittedly, there are ways in which ECDIS can be improved, both from a requirements point of view and in the way that individual manufacturers have implemented certain features.

As with all other technology, improvements in ECDIS will be a gradual but unceasing process. Importantly, just because improvements can be seen does not mean to say that the present system is inadequate, especially when compared to the traditional alternative.

Out-of-date charts

A surprising number of issues met at sea are connected with the inadequate update of ENCs. Many users blame the equipment – often by stating: "there is no easy way to see if all the charts are up-to-date."

This is certainly true of paper charts. Even using the facilities on the UKHO website it would be a tedious matter to check that all charts were properly updated. The ship must rely on having a good correction regime and logging process.

IMO requires ECDIS to have an automatic system that keeps and displays a record of all updates, including their time of application. Obviously, it is important that the user knows how to use the system and access the records.

In general, the entire set of loaded ENCs can be updated simply by inserting the latest cumulative update disk – and appropriately commanding the system to update all installed charts.

However, it should not be assumed that the update process will be executed just by inserting the disk, as has been incorrectly supposed by some users – it always involves additional user action, at least to select the appropriate action item from a menu.

If this process is completed successfully, it will be indicated by an appropriate message. This is the simple confirmation to the user that all charts have been updated.

The ECDIS will automatically flag up and keep a record of any problems encountered, which should be investigated, either to resolve them or to understand their significance to safety.

Although all ECDIS keep a detailed record of applied updates, some are not very clever at just giving a simple overview of when update disks were applied. For this reason it is appropriate to keep a manual log of when a disk is loaded, together with a note on whether any problems occurred during the update process.

It should be recognised that on some systems the updates can take an appreciable amount of time, so it is best done in port. In any case, to ensure that the latest updates available are in use at sea this is essential.

It does not need constant monitoring but regular checks on progress are recommended to see if the system has encountered any problems.
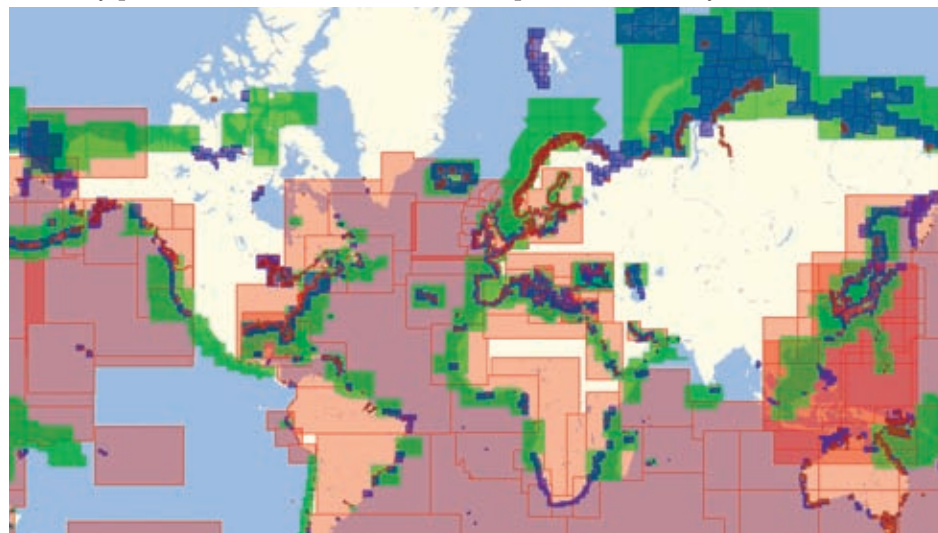
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If using ENCs from multiple data consolidators the process will require insertion of the latest update disks from each particular source. However, most ships just use data from one consolidator like, for example, the UKHO.

To satisfy port state inspections the manual log can first be shown, but users could be asked to display the record of the updates that the ECDIS keeps automatically. This record also shows any manual updates that have been applied.

In principle, the inspector can then check specific examples with a carried-onboard master list.

Loaded charts

The required ENCs for the route need to be determined from the data catalogue of the supplying organisation. This is available online and generally also via a mailed disk.

Catalogues are entirely computer-graphics based and so the required information is not accessible by thumbing through a book, as is the case for paper charts. It is normally accessed on a bridge computer but may be available on the ECDIS.

Chart selection is made easy, providing the user is sufficiently familiar with such computer-based catalogues – a necessary skill.

A check should be made that all charts relevant to the voyage are loaded into the ECDIS, particularly the largest available scale of any chart on, or immediately adjacent to, the planned route.

A number of problems are occurring, including some that have been the root cause of accidents, because not all appropriate charts have been loaded.

Fortunately, it is much easier to get new charts installed on the ECDIS than it is to obtain additional paper charts. Normally, a new permit code is all that is required to download an ENC from the base data disks held on the ship. This permit can be obtained by e-mail.

A justified complaint about ENC updates is that many do not include all the information contained in Temporary and Preliminary Notices to Mariners (T&Ps) that are designed for paper chart use.

For this reason, until the HOs improve the situation, it is necessary to check the paper T&Ps and apply voyage appropriate information as manual corrections or Mariners Notes.

This is tedious, but no more so than when using paper charts. It is, of course, necessary to understand the ECDIS equipment-specific procedures to apply such manual updates and notes.

The UKHO's recently announced e-Navigator service, in part, helps to simplify identifying the relevant T&Ps using software running on a bridge computer or the ECDIS.

Route planning

Judging by the number of complaints of how difficult it is to use ECDIS for route planning compared to paper charts, many users must surely misunderstand the route planning functionality of ECDIS.

While it remains an exacting task it should be considerably less tedious, if properly approached.

This is mainly because a route, either under construction or fully planned, is immediately visible on any selected chart that the route crosses.

For instance, ECDIS allows the initial rough planning to be performed on a small scale chart. Then, using successively larger scale charts, the route can be appropriately detailed.

Changes arising from the detailing, such as the inclusion of additional waypoints, are automatically reflected onto all other charts.

The main issue with using ECDIS for route planning is getting used to the smaller working area.

However, when planning a route from scratch across an ocean, you can start with a zoomed out image that encompasses both coastlines and create a very rough route, perhaps using great circles between major waypoints.

The fact that much detail will not be in evidence is not an issue at this stage– it only provides a rough guide that needs to be refined as the route is detailed onto larger scale charts.

Admittedly, route planning is far from just using features available on the ENC, with many other aspects needing to be fully taken into account, such as weather, ice, tides and currents.

The completed route should be manually checked for all charted hazards using the largest available scale for any segment of the route.

Then the ECDIS should be set to perform an automatic check. The system will use the largest available scale charts for this activity, whatever is displayed on the screen.

It is fundamental that appropriate parameters relating to own ship, including alarm limits, are set before this check is performed. Failure to do this in a sensible manner creates numerous warnings, which, in general, will also be replicated when voyage monitoring.

Of course, limits can also be inappropriately set such that true hazards are missed. Therefore a good understanding of the relevant issues is paramount.

Admittedly, the automatic route checking process is an area where individual equipment designs can over-complicate the process and may give information that appears confusing or repetitive.

Some manufacturers really need to relook at the way this has been implemented.

However, the automatic process is best taken as an extra benefit that ECDIS gives compared to paper charts. If the planning process is performed correctly it will come up with no unforeseen issues. **DS**

Dr Andy Norris has been well-known in the maritime navigation industry for a number of years. He has spent much of his time managing high-tech navigation companies but now he is working on broader issues within the navigational world, providing both technical and business consultancy to the industry, governmental bodies and maritime organizations. Email: apnorris@globalnet.co.uk