

Problems encountered in the development and provision of an integrated ENC service

UK has identified a wide range of issues related to the problem of providing a truly integrated ENC service; some of these were outlined in the UK information paper provided to the meeting of MS following the X-WEND. A resume of these is given below with, as appropriate, examples and the consequences and / or possible solutions that are available.

Differences between National HO practice – paper and ENC

P&T NMs

Most HOs produce P&T NMs for their paper products whilst only a small proportion use the facility provided in S57 to produce the same for ENC. As ENCs often cover areas different to the paper chart and cell identifiers are different to paper chart numbers there is no easy way for mariners using ENCs for primary navigation to ensure that they have access to this important information. Out of 42 ENC providers only 6 have a P&T service 2 do partially 19 don't and for 15 suppliers it is uncertain.

New Routeing Schemes

There has been a variety of methods of promulgating new TSS and other routeing measures with paper charts. This has now become more complex with ENC which has a DateStart/DateEnd attribute for features because of the varying implementations of this within existing ECDIS systems. Some nations announce changes by P&T NM (but only for paper products), some publish the new schemes in advance. Some only publish the changes post implementation. Few nations publish NEs of the affected charts in advance to ensure that the mariner has both pre and post implementation charts onboard prior to implementation date. UKHO acts to provide a consistent service to the mariner for schemes worldwide by using an 'X' chart procedure. Admiralty paper charts are updated for these routeing measures based on information and timescales issued by IMO; whilst it does monitor national HO NMs and NEs it does not wait for national HOs to publish their products. In this way UKHO has been able to supply mariners with details of new and amended schemes worldwide in advance. The differing practices of national HOs in this matter is now showing in ENCs.

Examples:

One nation including a new scheme (not using DATSTA/DATEND) on a NE to the ENC some months in advance – without any indication that it was not yet operational. The new route extended through an existing anchorage area.

Complaints have been received from customers about new TSS in the Mediterranean not being on ENCs until some 6 months after implementation. Worse still, because the different usage bands were produced by different nations they were updated at different times.

Chart Content

One nation has traditionally included significant navigational information in its SDs and annual NMs rather than putting this on the charts. This is naturally reflected in their ENCs. Whilst this is not wrong, it is confusing to internationally trading mariners who expect similar information across the series of charts they are using. In this case UKHO has traditionally supplemented Admiralty charts with SD and NM information to ensure consistency across the series is maintained.

Chart Notes

Most HOs include navigational significant information on paper charts in the form of notes. In creating ENCs and transferring this textual information across, there are examples of this being

done by some nations in ways that makes them inaccessible or inconvenient for mariners using ECDIS; thus potentially depriving them of significant information.

Use of encoding such as HTML and PDF rather than TIFF makes the information unusable on the vast majority of ECDIS systems; the HOs are aware that this is the case but have no wish to change their practice. Use of INFORM rather than TXTDSC for long notes results in the mariner having a single string of unstructured text.

Updating

There is a variety of updating regimes for paper charts (weekly, fortnightly etc) in both the paper and ENC environment. WEND principle 2.7 states that *'The updating of ENCs should be at least as frequent as that provided by the nation for correction of paper charting.'* Inspection of ENCs in comparison with the Admiralty and national paper charts has shown many examples of ENCs that are out of date for navigationally significant information.

- Some nations do not appear to have an updating capability at all.
- Some nations can only provide ER type updates by issuing a NE - this can mean a delay in issue
- In some cases NEs of ENCs lag behind paper chart NEs by several months
- At least one nation is updating only the largest scale chart (paper and ENC) by NM

Additional problems have been identified where a nation has extended ENC coverage outside its own national waters. In several cases the charts have been updated only from their national NM series and the NMs of the adjoining nations have not been included, leading to very significant omissions from the ENC where it is the only source, and to conflicting information where ENCs have already been produced by the adjoining nation.

Where nations are responsible for different usage bands within the same area inconsistency between bands becomes an additional issue.

UKHO has identified many differences between its paper chart series and available ENCs (so far it has looked at less than 10% of its 3300 paper charts). Many of these are not navigationally significant and a number point to potentially out of date information on the Admiralty chart (eg a stranded wreck inserted on a chart of the South China sea from a RN report in 1948). However there are a worrying large number of significant differences such as missing oil platforms and installations that have been inserted by HO's onto their paper charts but have not found their way onto the ENCs. In one case the source HO has said it has difficulty obtaining the NMs from another nation and that it was easier for UK to get them.

ENC Coding Practice

In comparison with paper charts the ENC standards and HO's experience of implementing them are immature. There are examples, such as that for notes given above, that significantly affect the usability of the ENC provided. Whilst IHO consistency recommendations will go a long way to resolving these issues it is clear that with things as they stand it will take many years before the official ENC product is as consistent and seamless as some privately produced products

Overlapping ENCs in same Usage Band

There are a number of areas worldwide where nations have chosen not to abide by the WEND principles in regard to their ENC coverage. In some of these cases, but by no means all, this is due to an international disagreement over maritime boundaries and responsibilities. Where an international dispute is the cause it is improbable that either nation will be persuaded to amend its data. This is not satisfactory within an integrated service where the overlap causes unpredictable problems due to differences in ECDIS implementation. In the paper chart world the UK has created its own products to cover these areas, ensuring that no favour is provided to either party, and this has generally, if grudgingly, been accepted in most cases. For overlapping ENCs where nations will not amend their data boundaries only a similar solution is workable. An integrated service provider wishing to issue a seamless dataset can:

- Remove offending ENC's from the service – leaving a gap in coverage
- Cut the data back to national waters (and in cases of disagreement use 'arbitrary' limits)
- Remove all offending ENC's and infill from paper charts as an interim until agreement is reached.

Leaving overlapping ENC's in an integrated service is not a sensible option from the mariner's perspective.

Inconsistencies within National HO chart series

UKHO has over many years built up a knowledge of the capabilities of various HOs and has access to an archive of information that can be used to investigate 'oddities' found on inspecting newly received information. In some areas of the world there is significant inconsistency between differing scales of paper chart and these have not been resolved even over many years. It is therefore unsurprising that these problems are reflected (and in some cases added to) by the ENC. It is easy to add to the confusion with production of ENC's - for example by incorrect coding of depths. A depth apparently of 17.5m found on one ENC had been encoded as 1 and 7.5 separately; this was only visible when a very high level of zoom was employed. Unless this sort of problem is identified and corrected early on it will lead to confusion for the mariner and a lack of confidence in the ENC product.

Conclusion:

There are many reasons other than national practice for the range of problems identified; these include:

- Lack of experience in paper and ENC production
- Reliance on individuals that then leave
- Loss of experienced staff due office relocation
- Lack of resource/funding

With all of the above issues there would appear, in the short to medium term, very limited options for the IHO community if it wants to provide mariners with truly integrated ENC services of the sort that the mariner has come to expect with paper and if it wants to ensure that the standards for official electronic charting are at least as good as those provided by private companies. Capacity building and co-operative bilateral and multilateral working are the way forward in the long term; however in the meantime IHO needs to find a way to ensure that the mariner's requirements are met.

To overcome some of these problems UK is looking to provide overlays to ENC's that include necessary additional information. A good question that the mariner might well ask is 'why isn't the information incorporated into the chart'? This could be achieved if the WEND principles were flexible enough to allow nations to add information to ENC's themselves as long as:

- The source nation was informed in advance and given an opportunity to resolve the issues
- The changes were necessary to provide the mariner with safety of navigation information
- Any changes made were entirely distinguishable from the source information
- The amended ENC was easily distinguishable from the original version.