

# IS “DUAL FUEL”™ VECTOR-VECTOR THE BEST WAY OF GETTING THERE?

## ENCs the Only Route to Paperless Navigation

Electronic Navigational Charts (ENCs) are produced to the hydrographic standard S57 ed 3. In order to enjoy official status as ENCs they must accord with the product specification and be up-to-date, thereby meeting International Maritime Organisation (IMO) regulations for paperless navigation using an Electronic Chart Display and Information System (ECDIS).

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Official electronic charts are often divided into two categories - vector charts, which are described as more intelligent, and raster charts. The latter are basically just a digital copy of a paper chart.

Examples of raster series are ARCS and BSB. When raster charts are used on ECDIS, the system is called a Raster Chart Display System (RCDS). Raster charts in RCDS mode lack full ECDIS functionality and can only be used together with an appropriate portfolio of up-to-date paper charts.

As the officially-approved vector format for full ECDIS paperless navigation, ENCs include features and attributes (such as position, colours and shape) held in a database which allow them to be selectively displayed and queried. This makes it possible to choose to display different chart images on the screen, depending on navigational conditions. These vector functions enable ECDIS, when interfaced with the Automatic radar plotting aid (Arpa) and an echo sounder, to provide important features such as anti-collision and anti-grounding warnings.

### Coverage

More and more shipping companies have decided to move over to full ECDIS implementation and paperless navigation with ENCs.

Coverage of such charts is steadily increasing, with most European coastal areas now included. Even within Europe, however, many sea routes are not covered with ENCs and companies must continue to include alternative charts with their ENCs.

### Requirements

So what should a master choose in order to supplement ENCs, non-official vector or official raster? He must naturally consider his chart folio requirements. First, ENCs should be used with any Electronic Chart System (ECS), not just those type-approved for ECDIS. ENCs represent the most accurate and up-to-date option, and the only IMO-approved vector charts available.

The next question is where the vessel will sail. Coastal navigation requires large-scale, highly detailed charts with good functionality in the ECDIS system. If the vessel generally sails on trans-oceanic routes, however, detailed charts may not be so necessary. But proper charts which permit the use of such ECDIS functionality as anti-collision and anti-grounding warnings are recommended.

If ENCs are available the master ought to make sure that they are on the system. ENC prices have fallen by about seventy per cent, and roughly match the cost of paper charts in many areas. Without ENCs, of course, the master would need paper charts with all the required updating services.

Where ENCs are unavailable, other global vector charts from private suppliers will at least allow the navigating officers to utilise the functionality acquired along with the chart system.

The best solution is the full “dual fuel”™ vector-vector option, which combines ENCs with other vector charts. This allows any vessel to employ paperless navigation where ENCs are available, and to benefit from most of the ECDIS functionality as a navigational tool using vector data where ENCs are not available.

A vessel will thereby enjoy the most cost-effective alternative and the alterations required as ENC coverage steadily encroaches on areas covered by private vector charts will be minor in terms of chart functionality. The biggest change, of course, will be the potential reduction in paper charts and expensive updating services as ENCs replace both other chart formats and paper charts with associated services.

### Navigate on ECDIS

Crew need to be fully trained to navigate on ECDIS. Such training should be ensured by attendance at proper courses provided by educational institutions or system suppliers. However, allowing crew to become slowly familiar with ECDIS via private vector charts, while integrating ENCs as the coverage increases, will ensure that they gain the best practical knowledge of the system.

Combining vector and raster charts in a system designed for vector functionality can confuse navigators. They may believe the settings in the ECDIS system are still working even when they move from ENCs to raster charts. This is far from the case.

The largest ECS, and all ECDIS, manufacturers have designed their systems to read the S57 ed.3 format. In addition, the major ENC centres have adopted a secure ENC encryption scheme which requires the systems to decrypt ENCs with unique decryption keys supplied by each service. This is intended to ensure data integrity and reassure navigators that they have the correct, approved chart. Thousands of systems are already in place on vessels, however, many companies delaying the upgrade of their ECS or ECDIS means that they are unable to read secured ENCs. However, the systems can use proprietary formats from private suppliers.

## SENC

Norway and Sweden are the first nations in the world to permit private companies to convert ENCs from S57 to proprietary formats before distribution as a System ENC (SENC). This allows new users to enjoy full global services with vector data and with a unique combination of ENCs for full paperless navigation, and private data to aid navigation with paper charts, but with ECS/ECDIS functions still operational. The Norwegian Hydrographic Office, which also operates the international Primar Stavanger ENC co-ordinating centre, controls the procedure for becoming a SENC distributor. This also requires SENC distributor certification from an authorised body such as Det Norske Veritas (DNV). The centre is now co-operating with other member states on this issue and some of them have already indicated that they are considering SENC distribution.

## ENC Coverage Increasing

General global ENC coverage is increasing. The USA has produced more than two hundred ENCs which will soon be commercially available. India also has large areas covered and is due to make these available in the near future. Meanwhile, shipping companies can buy areas of navigational coverage for Europe, Korea, Japan, Canada, Chile and Singapore. Next in line is increased coverage of the Mediterranean, coastal areas of South America and main routes to important Far Eastern cities. ENCs are here to stay, and it is now in everybody's interest that shipping companies choose the easiest route to paperless navigation. This will in turn reduce operational costs, increase navigational efficiency and enhance safety.

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<https://www.hydro-international.com/content/article/encs-the-only-route-to-paperless-navigation>

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