

# Electronic Chart FAQs

## What are Electronic Charts?

Electronic charts are the next generation of navigational charts. Their use in electronic charting systems simplify traditional navigation processes such as route planning and chart updating, and also enable automation of route tracking through use of satellite positioning devices. These features can greatly enhance navigational safety by improving situational awareness, especially in busy or confined waters.

Digital technology is used to develop electronic charts from traditional paper charts and directly from marine survey data. The importance of using official data is, as with paper charts, absolutely paramount to maximising safety and other related benefits. Official electronic charts currently take two forms: Electronic Navigational Charts (ENCs) and Raster Navigational Charts (RNCs).

## What are ENCs (Electronic Navigational Charts)?

Electronic Navigational Charts (ENCs) are official vector charts that conform to strict IHO Specifications that have been issued by or on behalf of a national hydrographic authority.

ENCs, by their very nature, are fully compliant with the International Hydrographic Organisation's (IHO's) S57 Version 3 Product Standard, and can only be issued by, or on the authority of, a government-authorized Hydrographic Office (HO). Each IHO member nation is responsible for producing ENCs of its own waters, and systematically updating them with all safety-critical information.

ENCs are the only vector charts that may be used for primary navigation in place of paper charts. When operating with ENCs, an ECDIS can be programmed to automatically trigger alarms to warn of impending dangers and provide significant benefits in terms of maritime safety, risk management, cost savings and other operational efficiencies.

ENCs consist of digitised data that records all the relevant chart features such as coastlines, buoys, lights, etc. These features and their attributes (such as position, colour, shape) are held in a database-like structure that allows them to be selectively displayed and queried, creating the potential to manipulate the chart image when displayed on screen. Because of their vector format, ENCs can also be linked to other onboard systems to provide additional automatic features such as warning alarms. 3 variations of the same ENC, showing minimum, intermediate and maximum data display levels.

## What ENC Coverage is available?

Worldwide ENC availability has accelerated considerably in the last few years, and some areas (e.g. Northern Europe) are now populated with near seamless coverage. However, some nations do not yet have the capability and/or capacity to produce ENCs of their national waters, and so some areas will remain unpopulated for the foreseeable future.

ENCs of most high priority areas (e.g. trade hotspots and key ports) will become available in the next few years, but other areas of lower priority could take longer.

The UKHO is dedicated to an ongoing programme of ENC production, both within its own national waters and in support of other hydrographic nations. To date, the UKHO has released extensive ENC coverage of the UK, Gibraltar, Malta, Egypt (including Suez), the Falkland Islands, and parts of the Caribbean, West Africa and the Middle East.

An electronic catalogue showing commercially available, produced but not yet commercially available and planned international ENC coverage is available from the IC-ENC website [www.ic-enc.org](http://www.ic-enc.org)

### **What is the Admiralty ECDIS Service?**

The Admiralty ECDIS Service brings together ENC services from multiple sources including RENCs and other Hydrographic Offices, and combines them with worldwide coverage of ARCS to provide a single, integrated service that enables full, regulatory compliant use of ECDIS.

Shipping companies subscribing to the Admiralty ECDIS Service purchase electronic chart coverage for specific routes or areas of operation. The UKHO provides ENC's where available and ARCS charts where not, and automatically issues new ENC's (at no extra cost) as coverage increases.

For the customer, this combined service means no multiple licenses, no multiple CD's, no duplicated costs and no 'blank cheque' scenario as additional ENC's become available.

ENC and RNC being used in combination.

### **What is the Admiralty ENC Service?**

As well as UKHO-produced ENC's of both national and foreign waters, the UKHO also provides ENC's produced by other Hydrographic Offices within its Admiralty ENC Service. The UKHO has made an ongoing commitment to expand the Admiralty ENC Service in order to provide a single 'one-stop-shop' source for all ENC data and make purchasing ENC's simpler for end users.

### **How do I obtain ENC's produced by other hydrographic offices?**

The UKHO has agreements with national hydrographic offices around the world to distribute the ENC's they produce. Admiralty ENC and ECDIS Services both provide you with efficient and cost effective access to a comprehensive set of ENC's from around the world.

### **What is a RENC?**

A RENC is a Regional ENC Co-ordinating Centre. In order to ensure uniformity in both format and distribution, the IHO created the WEND (Worldwide Electronic Navigational Database) principle. Under the WEND principle, each major geographical area of the world would have its own RENC. Each ENC-producing nation would send its data to the local RENC, who would then be responsible for validating and distributing its ENC's to end-users.

There are currently two RENC's worldwide; Primar-Stavanger based in Norway and the International Centre for ENC's (IC-ENC) based in the UK. Admiralty Marine is a distributor for and is able to supply ENC's from both RENC's via its Admiralty ECDIS and Admiralty ENC Services.

### **What are Raster Navigational Charts - RNCs**

RNC's use raster data to reproduce paper charts in an electronic format. Their familiar 'paper chart' image helps users gain confidence with the use of electronic charts, by providing a direct link between display screen and chart table.

RNC's consist of thousands of tiny coloured dots (pixels), that together make a flat digital image. Every pixel is geographically referenced, enabling accurate real-time (continually updated) display of vessel position when your chart display system is linked to GPS.

Additional user defined information such as route plans and shoal areas can be overlaid on an RNC to provide automatic links to other onboard systems (e.g. warning alarms) but unlike ENC's, charted features cannot be selectively displayed or queried.

RNC samples taken from ARCS charts BA2036 and BA2675.

RNCs must comply with the IHO's S61 data standard, and can only be issued by, or on the authority of, a government-authorised Hydrographic Office (HO).

**What is ARCS?**

ARCS stands for Admiralty Raster Chart Service – an electronic chart service that provides exact replicas of the Admiralty paper chart series in digital format.

**What is the difference between ECS and ECDIS?**

In every day life the terms Electronic Chart Display and Information System (ECDIS) and Electronic Chart System (or ECS) have become virtually interchangeable, but from a regulatory perspective ECDIS and ECS are far from equal. A genuine ECDIS is a high quality ECS that meets the requirement of the IMO performance standard and has been tested by an independent type -approval authority. Only type-approved ECS can legitimately be called ECDIS and only they are considered by the regulatory authorities to meet the requirements of SOLAS.

A laptop with navigational software (ECS). An ECDIS within an Integrated Bridge System (IBS). It is important to note that when used to display non-SOLAS-compliant electronic charts, an ECDIS is classified as an ECS and can only be used as an aid to navigation (see regulations below).

**What are the Regulations for Using Electronic Charts?**

The IMO requires that when using a type -approved ECDIS:

- ENC's can be used for primary navigation in place of paper charts, provided there is a suitable backup (e.g. another ECDIS with a separate power supply, or an appropriate folio of up to date paper charts).
- RNC's, when used in conjunction with ENC's (to fill the gaps in coverage) can be used for primary navigation together with an appropriate folio of up to date paper charts.
- What is considered 'an appropriate folio of up to date paper charts' varies between flag states, and may or may not represent a reduction in the number of paper charts required to be carried.

In order to navigate with ECDIS and ENC and remain SOLAS compliant it is also necessary to have a back-up in case of system failure. This may be a second ECDIS or a paper chart back up.

If you wish to navigate using electronic charts as your primary means of navigation you need a type approved ECDIS with back-up, ENC's where available and RNC's such as ARCS charts to fill the gaps. Initially, the ARCS component of this 'dual-fuel' combination is likely to form the majority of coverage, so a reasonable paper chart backup will still be required but this will gradually change as more ENC's become available.

The information above is provided only as a guideline, there are regional exceptions to these rules. Users must consult their own flag state's regulatory authority (e.g. the MCA for the UK) to find out their own Flag's position, as interpretations of SOLAS Chapter V can vary.

**Where Do I Purchase Electronic Charts?**

The UKHO offers a range of official electronic chart services to meet all requirements. For more information on the options available contact your Admiralty Chart Agent.

**How do I get more information about back-up requirements for electronic charts for use on my ships?**

For more information about paper back up requirements to support use of RNCs contact your flag state authority.