

## 27. SEA CHARTS – EXERCISES

### ADMIRALTY GUIDE TO ELECTRONIC CHARTING

1. Supply the correct multi-word term from those in the brackets:  
(Electronic Navigational Charts, marine survey data, route planning, positioning devices, electronic charts, Electronic Navigational Charts, navigational charts)

#### WHAT ARE ELECTRONIC CHARTS?

Electronic charts are the next generation of \_\_\_\_\_. Their electronic formats simplify traditional navigation processes such as \_\_\_\_\_ and chart updating, and also enable automation of route tracking through use of satellite \_\_\_\_\_.

These features can greatly enhance navigational safety by improving situational awareness, especially in busy or confined waters.

Digital technology is used to develop \_\_\_\_\_ from traditional paper charts and directly from \_\_\_\_\_. 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:

\_\_\_\_\_ (ENCs) and  
\_\_\_\_\_ (RNCs).

2. Read the text below:

‘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, 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.

Three variations of the same ENC, showing minimum, intermediate and maximum data display levels. 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-authorised 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.’

2.b Now match the beginning parts of the sentence in column A with a corresponding one in column B. The third row has been done for you already:

**ELECTRONIC NAVIGATIONAL CHARTS - ENC's**

ENC's are official vector format electronic charts.

A	B
1. ENC's consist of digitised data	A. that allows them to be selectively displayed and queried, creating the potential to manipulate the chart image when displayed on screen.
2. These features and their attributes (such as position, colour, shape) are held in a database-like structure	B. ENC's can also be linked to other onboard systems to provide additional automatic features such as warning alarms.
3. Because of their vector format,	
4. Three variations of the same ENC,	C. showing minimum, intermediate and maximum data display levels.
5. ENC's, by their very nature, are fully compliant with the International Hydrographic Organisation's (IHO's) S57 Version 3 Product Standard,	D. that records all the relevant chart features such as coastlines, buoys, lights, etc.
6. Each IHO member nation is responsible for producing ENC's of its own waters,	E. and can only be issued by, or on the authority of, a government-authorised Hydrographic Office (HO).

3. Supply the missing verb: (use, consist, can be overlaid, displayed, must comply, is linked, be issued, produce, providing, carry)

### **RASTER NAVIGATIONAL CHARTS – RNCs**

RNCs \_\_\_\_\_ to reproduce paper charts in an electronic format. Their familiar ‘paper chart’ image helps users gain confidence with the use of electronic charts, by \_\_\_\_\_ a direct link between display screen and chart table.

RNCs (and in deed all raster representations) \_\_\_\_\_ 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 \_\_\_\_\_ to GPS.

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

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

#### **RNC Distribution**

The UKHO \_\_\_\_\_ ARCS, the world’s leading RNC service. Over 3,000 ARCS charts are available, providing worldwide coverage in RNC format of the globally respected Admiralty chart series.

**4.a Read the following text and make your outline (write down notes which will help you discuss the text).**

### **HOW DO I USE ELECTRONIC CHARTS?**

To display an electronic chart you need either an Electronic Chart System (ECS), or an Electronic Chart Display Information System (ECDIS).

ECS is a generic description that can be used for anything from a laptop with simple navigational software to a fully Integrated Bridge System (IBS). An ECDIS is an official, type-approved display system (more than an ECS) that meets stringent IHO defined criteria.

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.

If electronic charts are used as a primary navigational tool (in place of, or in order to reduce the number of paper charts that need to be carried and kept up to date) the combination of charts and display system must conform to International Maritime Organisation (IMO) and national regulatory authority rules.

**4.b Now answer the following questions:**

- What do we need in order to display an electronic chart?
- What is an ECDIS?
- When is an ECDIS classified as ECS?
- What rules are you expected to observe when you use electronic charts as a primary navigational tool?

5. The parts of the following sentences have been jumbled except the first one. Rearrange the parts below to make reasonable sentences:

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

1. ENCs can be used for /

/ provided there is a suitable backup /

/ in place of paper charts /

/ primary navigation /

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2. RNCs, /

/ together with an appropriate folio of up to date paper chart /

/ can be used for primary navigation /

/ when used in conjunction with ENCs

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6. Read the following text and then complete the statements below:

**WHICH TYPE OF ELECTRONIC CHART IS BEST FOR ME?**

Both ENC's and RNC's are official electronic charts produced from approved hydrographic office data of the highest quality. Both can be updated automatically on a weekly basis, thus reducing the amount of time the mariner has to spend manually correcting charts.

ENC's offer the prospect of paper chart equivalency and more functionality than RNC's, but although ENC coverage is steadily increasing, it will take several years to reach global levels. Due to the relative infancy of both ENC and ECDIS, regulations for their use can vary from country to country and can be confusing.

RNC services such as ARCS already offer worldwide coverage, providing navigators with the safety and operational benefits of official electronic charts virtually everywhere in the world. However, despite the fact that RNC's provide exactly the same data as their equivalent paper charts, current regulations do not support the use of RNC's for primary navigation when used independently of ENC's, and without some form of paper chart backup.

**So What Does this Mean in Practical Terms?**

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.

Complete the following statements on the basis of the text above:

1. If the ENC's and RNC's are updated on a weekly basis,  
\_\_\_\_\_ .
2. Although ENC coverage is on a steady increase,  
\_\_\_\_\_ .
3. RNC services such as ARCS have a world wide coverage and  
\_\_\_\_\_ .
4. But they are not used for \_\_\_\_\_ because  
\_\_\_\_\_ .
5. This practically means that  
\_\_\_\_\_ .



6. Supply the missing adjective: (best, available, user-friendly, familiar, trusted)

### **Electronic Charts as an Aid to Navigation**

Where electronic charts are displayed within an ECS as an aid to navigation, it is likely that ARCS will continue to offer the mariner the \_\_\_\_\_ overall package for some years to come, because as well as the generic benefits associated with all electronic charts, also:

- Is the only service \_\_\_\_\_ that provides global coverage of official electronic charts.
- Is \_\_\_\_\_ as it provides an exact correlation between the \_\_\_\_\_ electronic chart on your ECS/ECDIS screen and the Admiralty paper chart on your chart table.
- Is a tried, tested and, most importantly, \_\_\_\_\_.

The above benefits have made ARCS the preferred choice amongst many mariners worldwide.

7. Read the text below and decide on the points where you agree and where you disagree with the statements on the future of Primary Navigation

### **The Future of Primary Navigation**

The UKHO is currently conducting sea trials of a new service, designed specifically to provide a 'one-stop-shop' for both ENC's and RNC's. The new Admiralty ECDIS. Service will bring together ENC services from multiple sources including RENC's and other Hydrographic Offices, and will combine them with worldwide coverage of ARCS to provide a single, integrated service that will facilitate full, regulatory compliant use of ECDIS.

Shipping companies subscribing to the Admiralty ECDIS Service will purchase electronic chart coverage for specific routes or areas of operation. The UKHO will provide ENC's where available and ARCS charts where not, and will automatically issue 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 within their subscription period. For further information regarding the Admiralty ECDIS Service, [click here](#).

### **FURTHER INFORMATION**

#### **Where Do I Purchase Electronic Charts?**

ENC's and RNC's are available from the UKHO's worldwide network of approved Admiralty Distributors. Your Admiralty Distributor will be able to give you detailed information about the Admiralty services available.

Read the terms and abbreviation below aloud and try to remember as many as you can.

Glossary of Terms (Electronic Charts):

ARCS	Admiralty Raster Chart Service
ECDIS	Electronic Chart Display & Information System
ECS	Electronic Charting System
ENC	Electronic Navigational Chart
GPS	Global Positioning System
HO	Hydrographic Office
IBS	Integrated Bridge System
IHO	International Hydrographic Organization
IMO	International Maritime Organization
MCA	Marine Coastguard Agency
RENC	Regional ENC Co-ordinating Centre
RNC	Raster Navigational Chart
SOLAS	Safety Of Life At Sea
UKHO	United Kingdom Hydrographic Office

Now give the full terms for the abbreviations below:

ARCS	
ECDIS	
ECS	
ENC	
GPS	
HO	
IBS	
IHO	
IMO	
MCA	
RNC	
SOLAS	
UKHO	