



Information Sheet

AT A GLANCE

ECDIS: Electronic Chart Display Information System is a complete Hardware and Software system which conforms to the IMO S-57 requirements.

S-57: Standard for the programming of software for electronic navigation

S-52: Standard for the way objects and colours are presented

IHO: International Hydrographic Organisation
www.iho.shom.fr
An body consisting of 72 member states based in Monaco, formed to provide "adequate and timely hydrographic information for world-wide marine navigation and other purposes, through the endeavors of national hydrographic offices" by the "application of hydrographic data to support science, and to promote its use in geographic information systems, principally for the sustainable development of national maritime zones"

IMO: International Maritime Organisation
www.imo.org
An international organisation to promote "maritime safety, efficiency of navigation and prevention and control of marine pollution from ships"

RNC: Raster charts are pictures of a chart: the information is not dynamic, so it is like a photo of the chart.

During the early 1980's, the member countries of the International Hydrographic Organisation (IHO) identified that the emerging computer technology could provide a digital representation of the paper chart on a computer screen, along with real-time positioning and interfaces to radar and other navigation sensors. The IHO formed several working groups to define the standards for data encoding and digital chart presentation. From this early work, the Electronic Chart Display and Information System (ECDIS) evolved.

Consistency and legal liability is a major issue for international navigational charts. For this reason, the IHO developed two standards. The first standard, S-57, describes the data model, object and attribute definitions for charted objects, encoding guidelines, product specifications and data structure of the Electronic Navigation Chart (ENC). The second standard, S-52, describes the presentation of the colours as well as chart and navigation symbols for ECDIS.

The IHO also works closely with the International Maritime Organisation (IMO), to develop operational performance specifications and a rigorous type-approval test regime for ECDIS manufacturers. For a system to be certified as being ECDIS-compliant, it must be type approved by an independent authority. The type approval process ensures that the ECDIS functions in accordance to the specified tests developed by the IMO, the IHO and other international bodies. For large commercial shipping, the IMO and its national member countries have mandated that vessels must carry ECDIS for primary navigation in certain national waters.

A contributing factor to the slow emergence of ECDIS, has been the lack of S-57 ENC data produced by the national Hydrographic Offices (HO's). The availability of ENC data is gradually increasing, but most HO's still lack adequate coverage of their waters. During the 1990's, several HO's with large areas of responsibility (i.e. Australia, UK, USA) identified that production of ENC's would be a lengthy process and thereby developed a Raster Navigation Chart (RNC) product that could quickly fill the official digital data gap and provide users with the foresight of what was to come with ECDIS. With the availability of ECDIS technology, several HO's have adopted a position whereby a RNC, when used on an ECDIS, will have legal equivalency to the paper chart.

The lengthy time required to develop these standards provided opportunities for private companies to develop like-systems using proprietary file formats and data presentation, usually operating on a PC environment. These systems, whilst providing much of the navigational functionality of ECDIS, they did not generally use official data or provide the necessary backup facility. These systems are called Electronic Chart Systems (ECS). Hence, ECS do not meet the legal requirements of the IMO for safe navigation. When using ECS, the user should have a copy of the official paper chart as a backup.

The following table summarizes some of the differences between ECDIS and ECS:

Feature	ECDIS	ECS	Comment
Uses official ENC data	Yes	Maybe	Many ECS now support S-57 ENC but originally used proprietary formats
Uses official RNC data	Yes	Maybe	Some ECS don't support raster formats
Uses unofficial chart data	Maybe	Yes	An ECDIS system can support chart data in other formats. However, the ECDIS will log the use of such data (non-ECDIS mode) and the user should also navigate with a paper chart.
Hardware configuration requirements	Yes	No	An ECDIS requires large format, calibrated high resolution monitors and must include the necessary backup features.
Type Approval required	Yes	No	For a system to be recognised as an ECDIS, it must pass certification by an independent Type Approval authority.
User Market	Large commercial shipping and military	Pleasure market, professional fishing and small commercial operations	
Cost	Usually more than \$50,000	Usually less than \$2,000	ECDIS is an integrated product of software and hardware
Number of systems in the world market	About 10	40+	