

The View from the Bridge

Digital Hydrography Conference

Southampton 29/30 October 2013

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“Hydrography is the branch of applied science which deals with the measurements and description of the physical features of oceans, seas, coastal areas, lakes and rivers, as well as the prediction of their change over time, for the primary purpose of **safety of navigation**.....”

DNV Report to IMO 2008

“ECDIS, if used correctly, could reduce groundings by about 30 per cent and would provide a cost-effective means of reducing risk for ships larger than a certain threshold for various ship types.”



Maersk Kendal – from MAIB report



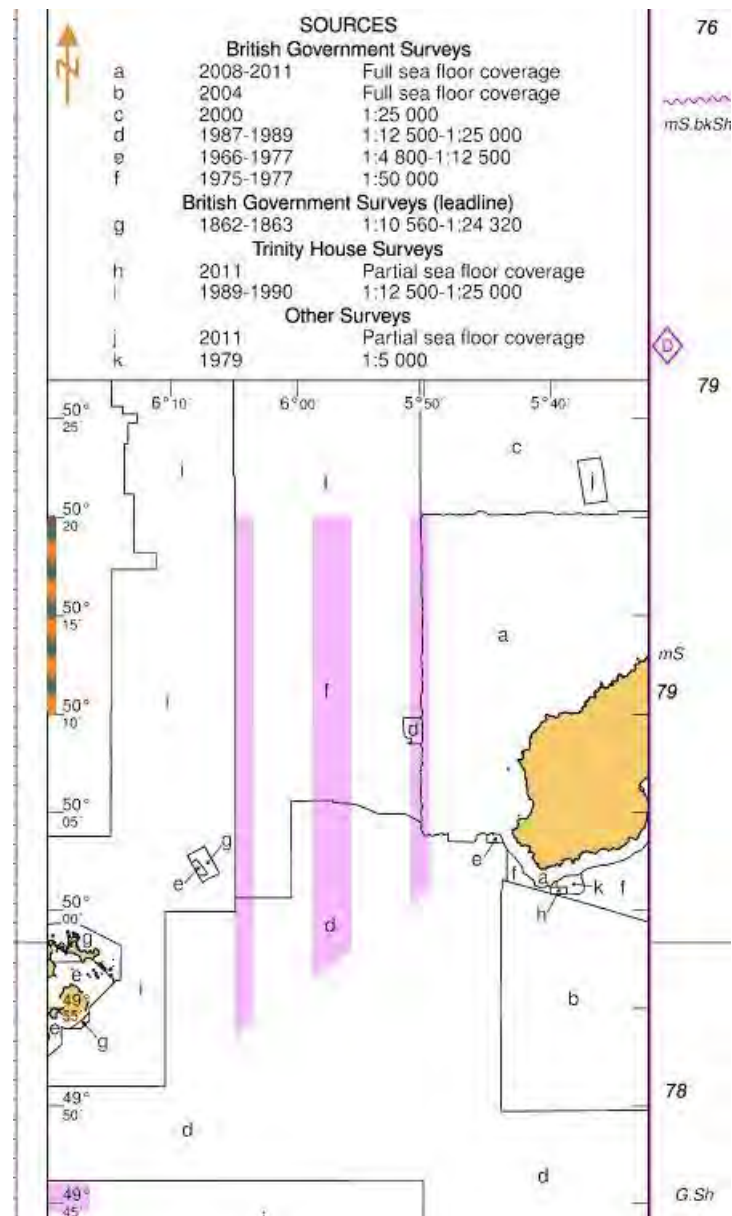
ECDIS - night view at 1:5000 scale

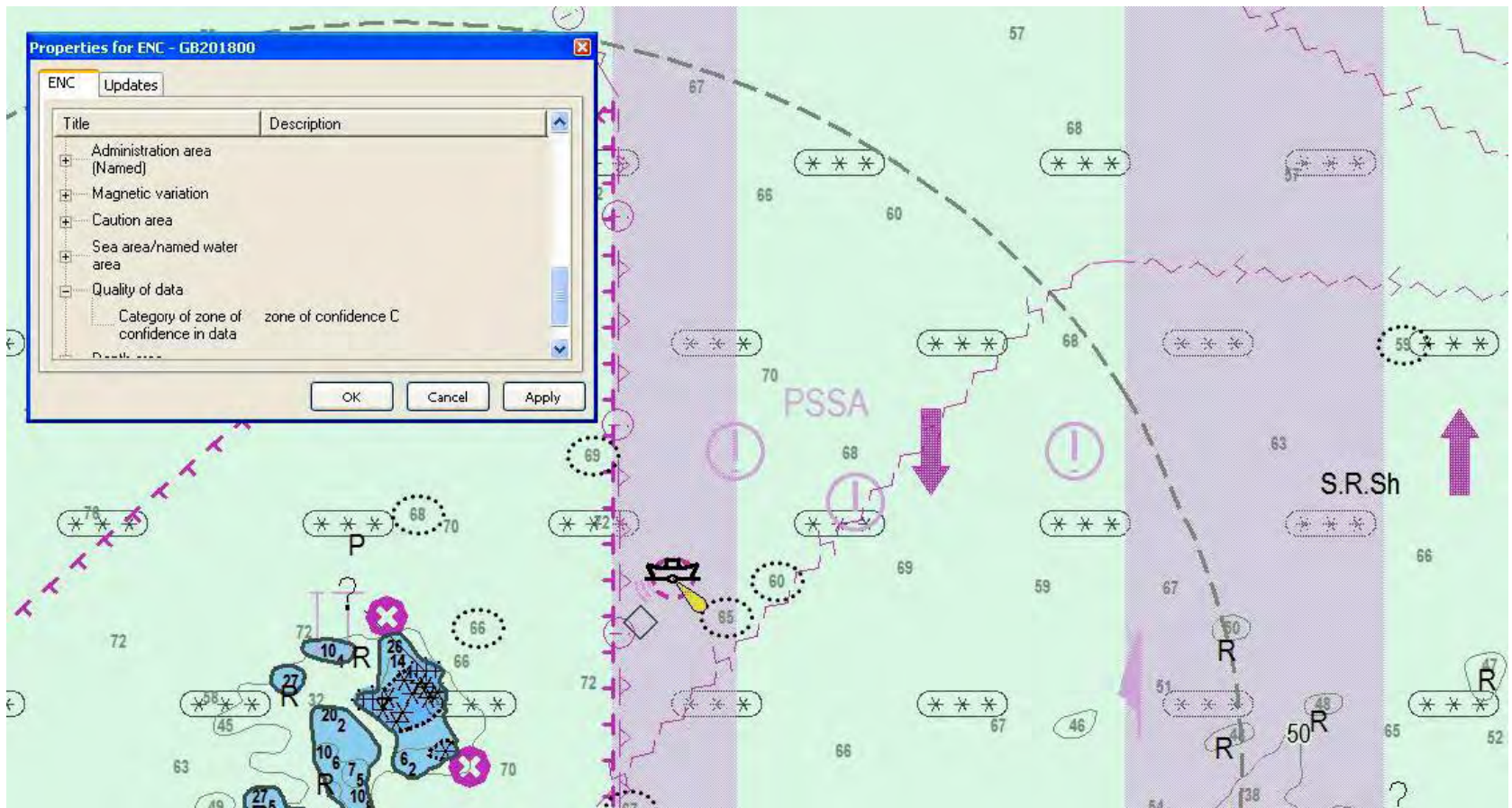


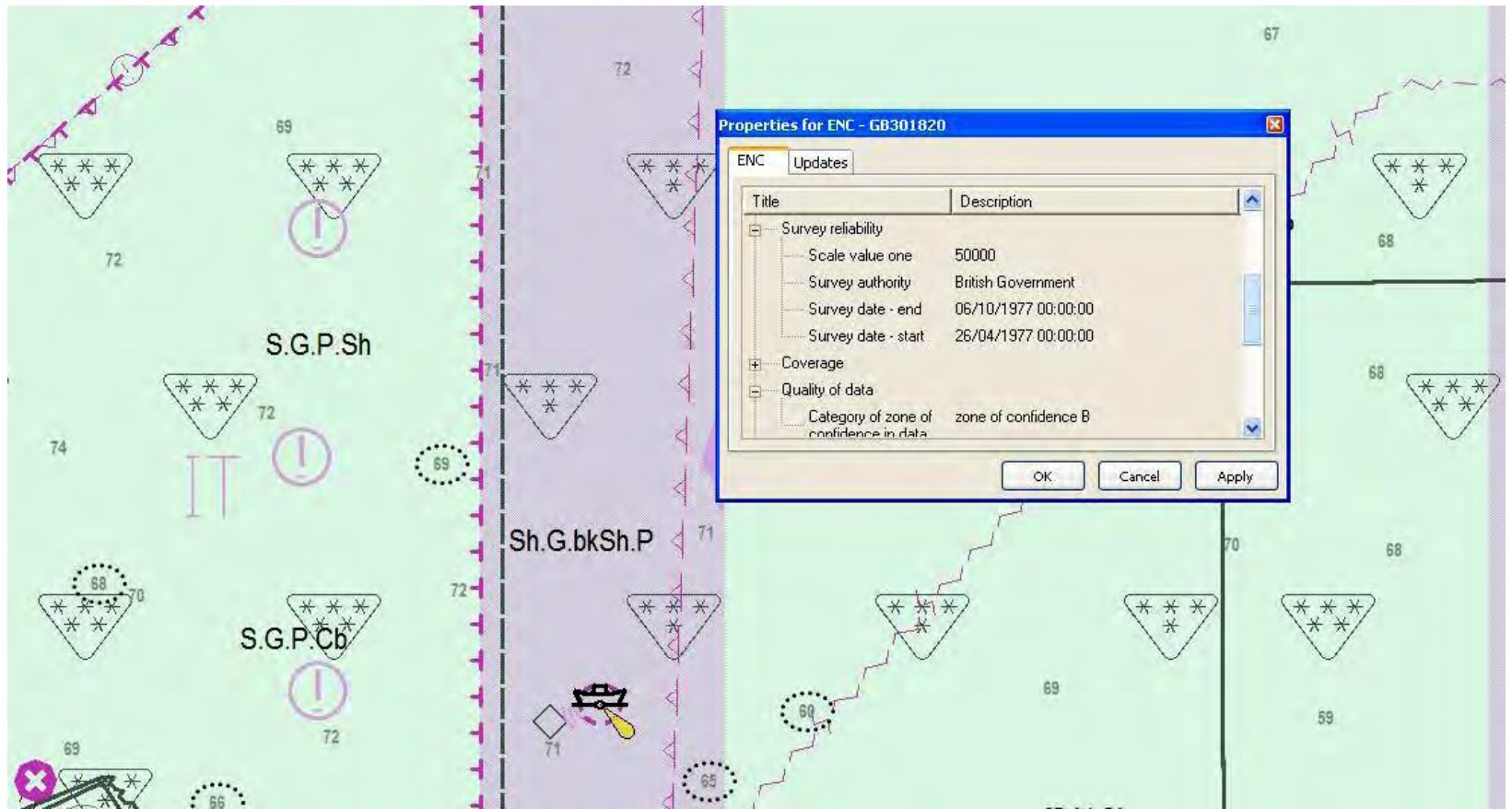
Zone of Confidence Table

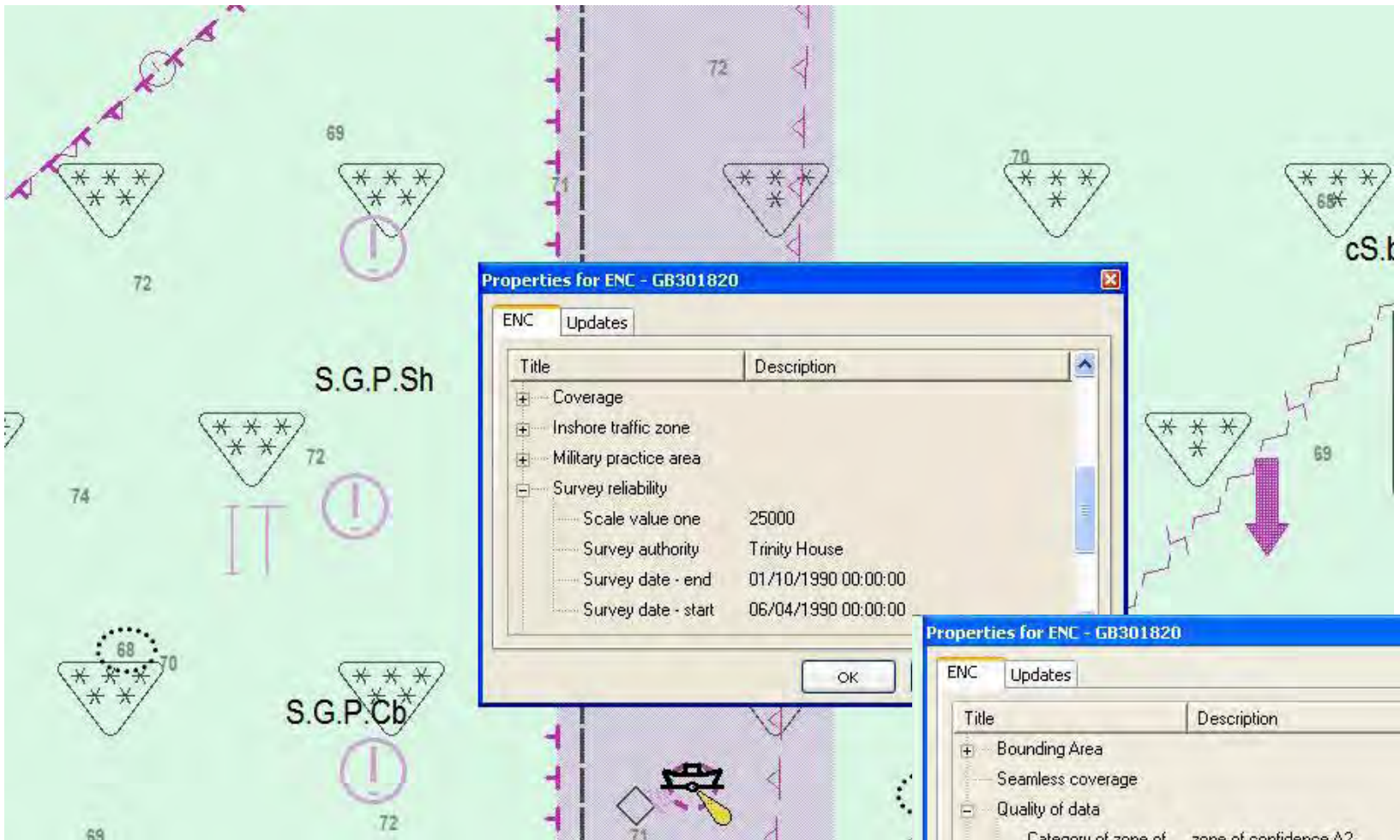
1	2	3		4	5
ZOC ¹	Position Accuracy ²	Depth Accuracy ³		Seafloor Coverage	Typical Survey Characteristics ⁴
A1	± 5 m + 5% depth	= 0.50 + 1% d		Full area search undertaken. Significant seafloor features detected ⁵ and depths measured.	Controlled, systematic survey ⁶ high position and depth accuracy achieved using DGPS or a minimum three high quality lines of position (LOP) and a multibeam, channel or mechanical sweep system.
		Depth (m)	Accuracy (m)		
		10 30 100 1000	± 0.6 ± 0.8 ± 1.5 ± 10.5		
A2	± 20 m	= 1.00 + 2% d		Full area search undertaken. Significant seafloor features detected ⁵ and depths measured.	Controlled, systematic survey ⁶ achieving position and depth accuracy less than ZOC A1 and using a modern survey echosounder ⁷ and a sonar or mechanical sweep system.
		Depth (m)	Accuracy (m)		
		10 30 100 1000	± 1.2 ± 1.6 ± 3.0 ± 21.0		
B	± 50 m	= 1.00 + 2% d		Full area search not achieved; uncharted features, hazardous to surface navigation are not expected but may exist.	Controlled, systematic survey achieving similar depth but lesser position accuracies than ZOC A2, using a modern survey echosounder ⁷ , but no sonar or mechanical sweep system.
		Depth (m)	Accuracy (m)		
		10 30 100 1000	± 1.2 ± 1.6 ± 3.0 ± 21.0		
C	± 500 m	= 2.00 + 5% d		Full area search not achieved, depth anomalies may be expected.	Low accuracy survey or data collected on an opportunity basis such as soundings on passage.
		Depth (m)	Accuracy (m)		
		10 30 100 1000	± 2.5 ± 3.5 ± 7.0 ± 52.0		
D	worse than ZOC C	Worse Than ZOC C		Full area search not achieved, large depth anomalies may be expected.	Poor quality data or data that cannot be quality assessed due to lack of information.
U	Unassessed - The quality of the bathymetric data has yet to be assessed				

Source Diagram— Chart BA 1148 Scale 1:75000









Properties for ENC - GB301820

ENC Updates

Title	Description
<input type="checkbox"/> Coverage	
<input type="checkbox"/> Inshore traffic zone	
<input type="checkbox"/> Military practice area	
<input type="checkbox"/> Survey reliability	
Scale value one	25000
Survey authority	Trinity House
Survey date - end	01/10/1990 00:00:00
Survey date - start	06/04/1990 00:00:00

OK

Properties for ENC - GB301820

ENC Updates

Title	Description
<input type="checkbox"/> Bounding Area	
<input type="checkbox"/> Seamless coverage	
<input type="checkbox"/> Quality of data	
Category of zone of confidence in data	zone of confidence A2
<input type="checkbox"/> Navigational system of marks	
<input type="checkbox"/> Coverage	
<input type="checkbox"/> Inshore traffic zone	

OK Cancel Apply

“SAFE” Areas

Any real time display of safe areas is a welcome improvement. Currently the navigator still has to add chart user object lines to delineate safe areas with respect to tides so that the Safe Contours are not relevant to the state of tide

Using ships data and met data to create areas/zones with varying degrees of confidence would be a good idea. I have often seen areas of data input not used in ECDIS e.g. thrusters, wind, draft etc. I would pose the question as to how the model criteria that would create these zones be developed and what sources of error would be input?”

The Mariner's Handbook (NP100)

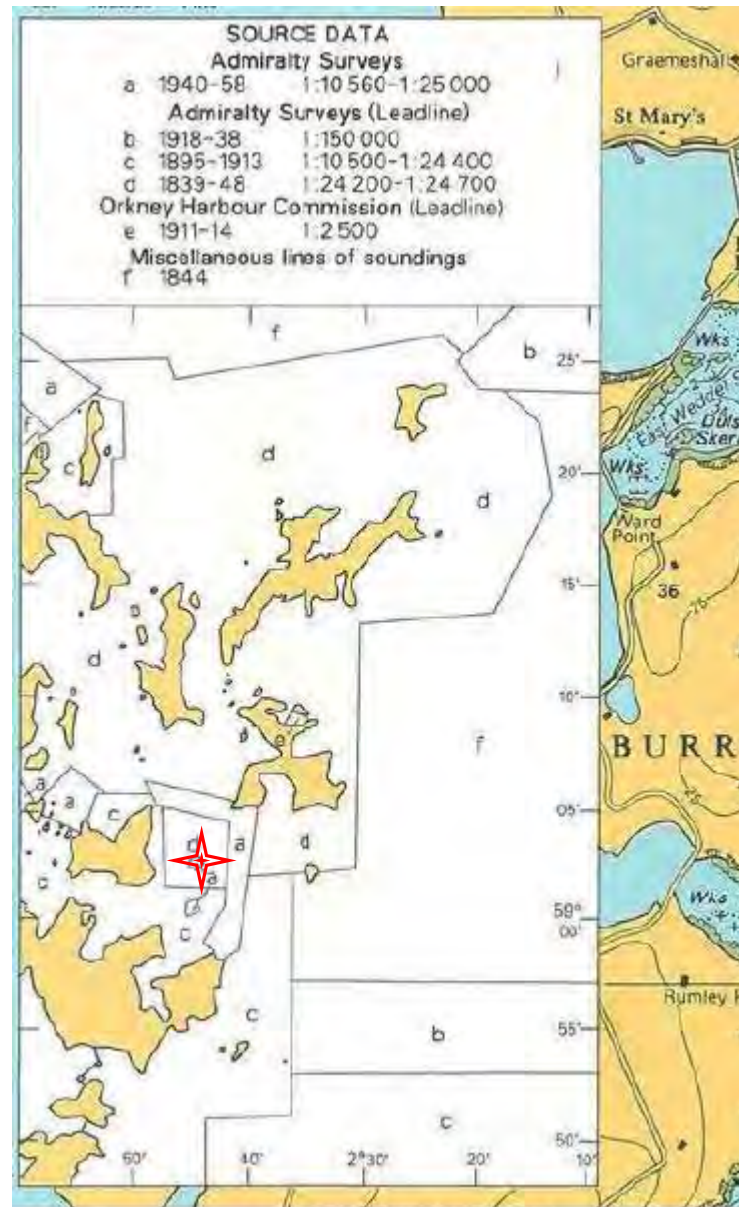
The maximum draught of vessels at the time of the survey should also be given consideration. The earlier surveyors were primarily concerned with the safe navigation of ships of their own era.

Draughts of 15 m were considered a maximum until 1958

Sidescan sonar came into general usein 1973 enabling many wrecks and shoals lying between lines of soundings, which might otherwise not be located, to be detected.

Harald/Octopus grounding

September
2006



BA Chart 2250 Source data

Paper Charts v Electronic Charts

Paper chart is compiled by a cartographer and he or she chooses what is displayed on the paper chart

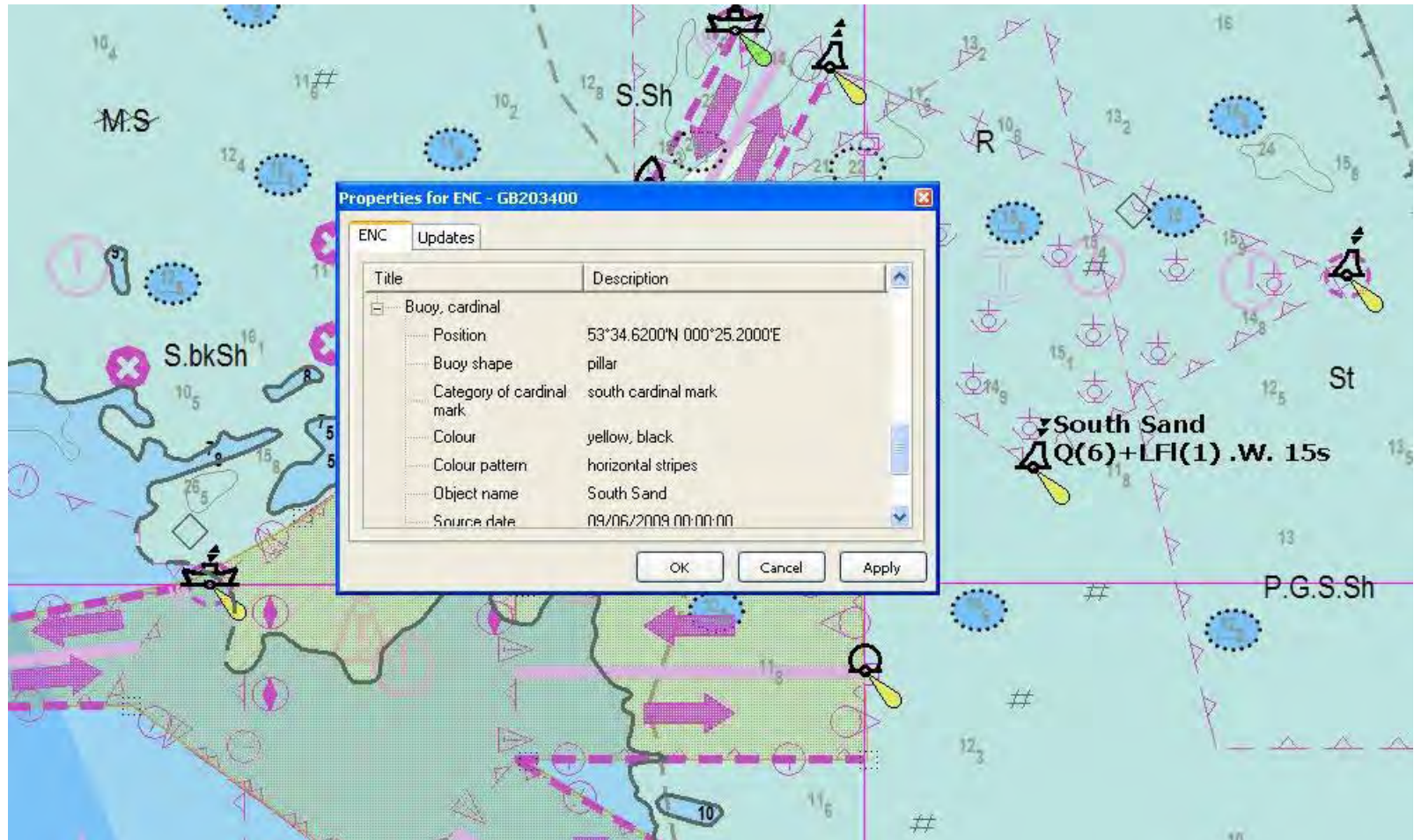
An ENC is a database, from which the navigator builds a map, selecting or omitting data, to suit the situation, i.e. he or she decides on what is displayed



Electronic Chart Table Demo



Pick Report



- Maritime professionals involved in the control of sea-going ships
- 6,500 members, 40+ branches worldwide
- Not for Profit – Member funded
- **Publication of best practice - Practical Guides 'By Practitioners for Practitioners**

ECDIS

January 2012

Industry Recommendations for ECDIS Training

Being aware of the implementation of Electronic Chart Display and Information Systems (ECDIS) has given rise to confusion in regard to ECDIS training, an industry group, organized and coordinated by The Nautical Institute and comprising leading international shipping industry organisations, held a series of meetings in order to produce this guidance on issues of training and competency for ECDIS.

The 2010 amendments to the STCW Convention for ECDIS training will not take full effect until 2017. Therefore in accordance with best practice it is recommended the approved ECDIS training be undertaken as soon as practical to ensure the full bridge watchkeeping officer meet all the competencies as required by STCW prior to sailing on a ship fitted with ECDIS.

It is recognised by all signatories to this guidance the ECDIS, as defined by the International Maritime

Organization (IMO), when implemented will be one of the most important navigation and decision support tools. The complexity of ECDIS should be recognised and the ability of a watchkeeping officer to be competent and confident in operating ECDIS as part of the shipboard navigational system is essential for safety, security and protection of the marine environment.

The regulatory requirements for Generic Training and Familiarisation in ECDIS are covered by various international instruments including the IMO STCW Convention, the ISM Code, SOLAS and also by national laws. The industry also recognises that compliance with these regulations including the required competencies are increasingly being examined by external parties including Ports & CoI, insurance inspectors, charterers and accident investigators. The industry organisations recognise the following definitions for ECDIS Training:

Training definitions

Generic ECDIS Training: ECDIS training to ensure that navigators can use and understand ECDIS in the context of navigation and can demonstrate all competencies contained and implied by STCW 2010. Such training should ensure that the navigator knows how to use ECDIS and can apply it in all aspects of navigation, including the knowledge, understanding and proficiency to transfer that skill to the particular ECDIS system actually encountered on board, prior to taking over navigational duties. The level of training should be the competencies at least equivalent to those given in IMO Model Course 1.27.

Familiarisation: Following the successful demonstration of competencies contained in the Generic ECDIS Training, familiarisation is the process required to become familiar with any onboard ECDIS (including back-up) in order to assure and demonstrate competency on board any specific ship's ECDIS installation prior to taking charge of a navigational watch.

ECDIS

November 2012

Industry Recommendations for ECDIS Familiarisation

BACKGROUND

Being aware that the implementation of Electronic Chart Display and Information Systems (ECDIS) has given rise to confusion in regard to ECDIS Generic Training and Familiarisation with onboard systems, an industry group, organized and coordinated by The Nautical Institute and comprising leading international shipping industry organisations, has been meeting since 2011 to produce a range of guidance to clarify the requirements for competency in relation to ECDIS.

It should be noted that the term type specific as used by some administrations is not referred to by this industry group. After discussion it was agreed that only the terms 'generic training' and 'familiarisation' are covered by IMO instruments STCW 2010 and ISM respectively.

This particular guidance deals with the need for competency following Familiarisation with ECDIS specific onboard equipment and its arrangements. The Familiarisation will be complementary to ECDIS Generic Training¹. The regulatory requirements for Familiarisation with ECDIS are covered by the ISM Code (including sections 6.3 & 6.5) and the STCW Convention Regulation 174 which require the Company to establish procedures to ensure that new personnel and personnel transferred from assignment unrelated to safety and protection of the environment are given proper familiarisation with their duties.

FAMILIARISATION

It is recognised by all signatories to this guidance that ECDIS, as defined by the International Maritime Organization (IMO) when implemented will be one of the most important navigation and decision support tools. The complexity of ECDIS should be recognised and the ability of a watchkeeping officer to be competent and confident in the operation of ECDIS, including peripheral equipment and actual versions of software and charts, as part of the shipboard navigational system is essential for safety, security and protection of the marine environment.

ECDIS Familiarisation has, therefore been defined as:

Familiarisation: Following the successful demonstration of competencies contained in the ECDIS Generic Training, familiarisation is the process required to become familiar with any onboard ECDIS (including back-up) in order to assure and demonstrate competency on board any specific ship's ECDIS installation, prior to taking charge of a navigational watch.

Familiarisation should cover Initial Preparation, Basic Operations, Chart Navigational Tools and Functions, Route Planning and Route Monitoring. Familiarisation includes any pertinent information required for the safe operation of the ECDIS, including all updates and alterations. Companies should have clear procedures for using ECDIS and assisting the navigators in completion of the Familiarisation process.

¹ Definition of Generic Training Training ensures that navigators can use and understand ECDIS in the context of navigation and can demonstrate all competencies contained in Model Course 1.27. Such training should ensure that the navigator knows how to use ECDIS and can apply it in all aspects of navigation, including the knowledge, understanding and proficiency to transfer that skill to the particular ECDIS system actually encountered on board, prior to taking over navigational duties. The level of training should be the competencies at least equivalent to those given in IMO Model Course 1.27.

Source: The Nautical Institute's ECDIS Training Group, www.nautical.org/ECDIS/Training



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Control of Seagoing Craft.*

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Thank You

