Gain a competitive edge using electronic charts for emergency response and salvage business

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This paper outlines the benefits of using electronic charts for emergency response and salvage. The tug and salvage industry can gain significant benefits from using electronic charts in place of paper charts. It is only a matter of time before electronic charts will replace paper in this sector of the industry.

The key benefits in using electronic charts are:

- Improvements in speed of response
- Incidents can be responded to from any location in the world, if the charts are on a notebook
- Different scale charts can be selected in seconds
- Estimating the ETA of nearest support vessel is quick and can be re-calculated easily, printed out and emailed
- Tidal stream predictions can be overlaid onto the chart. Past dates can be viewed post-incident to justify any decisions taken

1.0 Introduction

Electronic charts have been available in the marketplace for nearly a decade. In fact, PC Maritime was the first original equipment manufacturer (OEM) in the world to be licensed for the UK Hydrographic Office ARCS charts in 1996. The use of electronic charts for salvage, emergency response and many other management tasks is not governed by any legislation.

Using electronic charts and appropriate software leads to:

- Improved efficiency when handling incidents
- Faster response times
- Greater flexibility and portability - salvage managers can be in touch from anywhere in the world
- Fast chart delivery direct to PC or laptop via email
- Electronic charts on a single PC replace an entire paper chart cabinet

2.0 Background to Electronic Charts

Electronic charts are produced in two formats, raster and vector. Official government charts are produced by national Hydrographic Authorities (such as UKHO) and unofficial charts by private companies such as C-Map. For use ashore, you can select the chart format that suits your needs. There is no legislation governing what chart type is required. However, in some instances official charts are preferred, particularly for incident investigation.

Electronic charts cannot be read without charting software. ARCS, for instance, are produced in HRCF format (Hydrographic Raster Chart Format). This is a different format to standard graphics formats such as tif and jpeg. To use electronic charts in offices, the following are needed:

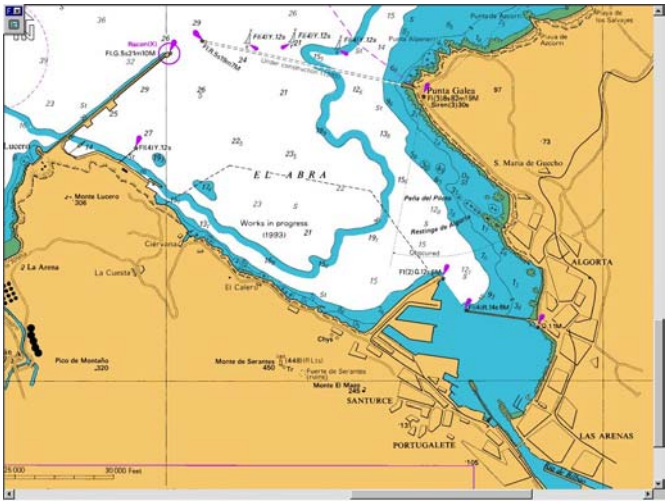
- Electronic charts
- Charting software, e.g. Navmaster Office
- Laptop or PC

PC Maritime have developed the Navmaster Office chart system specifically for office-based use, where traditionally paper charts have been used. Navmaster Office displays and manages the charts, and provides useful management tools.

2.1 Raster Charts

By far the largest supplier of official raster charts in the world is the UK Hydrographic Office. They produce approximately 2800 raster charts worldwide. Areas that are not yet covered in raster format are Canada, Brazil and Japan[1]. The raster chart is essentially a facsimile copy of a paper chart. The high quality cartographic process, accurate to 0.1mm, enables the UK Hydrographic Office to give a unique guarantee that ARCS are as up-to-date as their paper equivalents. The Australian Hydrographic Office produces Seafarer charts in raster format, for Australian and New Zealand waters.

There are two ways of purchasing ARCS charts. The difference lies in the updating service.



An ARCS raster chart

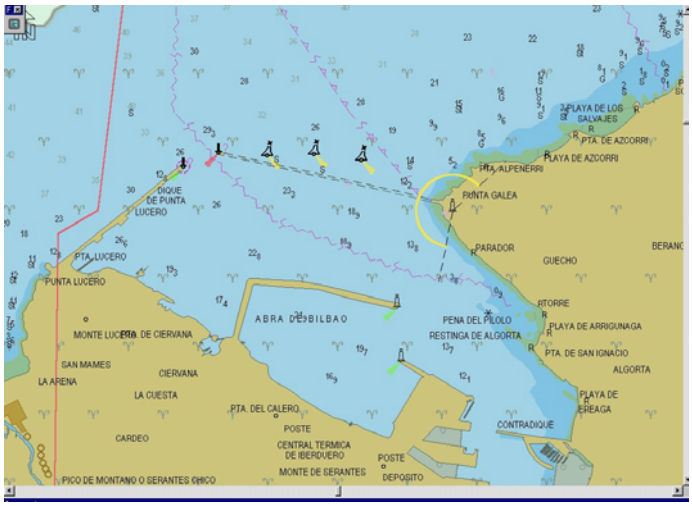
(i) ARCS Navigator is an annual rental agreement, which includes all weekly updates and any new editions. Different charts can be selected when renewing the agreement in succeeding years.

(ii) ARCS Skipper enables ARCS charts to be owned outright. The charts are fully up to date when purchased. Updates are not included in the price, but an annual update or a quarterly update can be purchased later.

2.2 Vector Charts

Vector charts are produced in a different way to raster charts. A vector chart is made up of series of data, for instance all depth contours will be stored in one layer, buoy information in another layer. This means that the chart can be interrogated; for example, details of the buoy can be displayed in a text box. There are various producers of vector charts. National Hydrographic Offices produce official vector charts known as S-57 Electronic Navigation Charts. Official S-57 charts must to be used in an Electronic Chart Display and Information System (ECDIS). In addition, private manufacturers also produce vector charts.

[1] The UK Hydrographic Office hopes to have agreement from Brazil and Canada this year (2002) to produce their charts in ARCS format



A C-Map CM93 vector chart

Vector chart producers have different pricing schemes for their charts, but these are similar to ARCS charts in principle. You can either purchase outright or subscribe to the charts each year.

3.0 Using electronic charts in the field

The use of electronic charts in offices and on laptops, in particular for emergency response, is increasing. It is not hard to understand why.

3.1 Improving efficiency

In an emergency quick access to charts is vital. An office-based chart system gives the emergency response team the ability to respond to an incident quickly.

> "Navmaster Office has enabled us to speed up the risk assessment when determining the dangers to a casualty and our own tugs, and assessing the appropriate contract to offer".
> (*Captain Mark Hoddinott, Salvage Manager, United Salvage*)

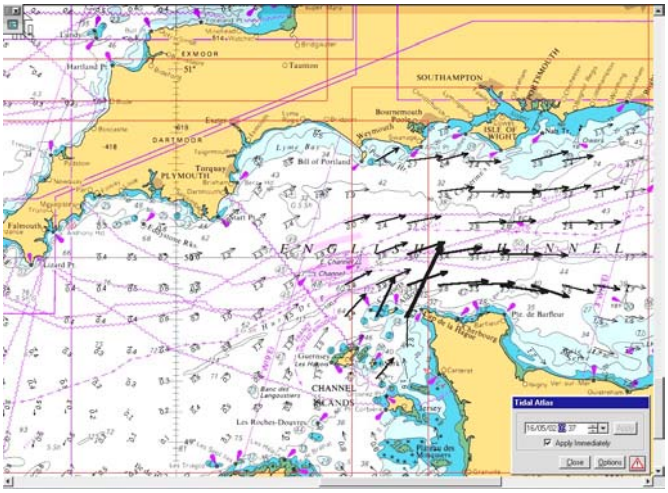
> "When an emergency takes place on a ship at sea, almost the first support document needed by the response team is a navigational chart of the area. Up to now the MCA has maintained a set of paper charts to help us in emergency situations. With Navmaster Office and Admiralty electronic charts available in our Incident Room at Headquarters, we have faster access to charts and are able to assess situations more quickly. Our Regional Officers have Navmaster ready on their laptops, giving them the ability to plot incident position on the right Admiralty chart within minutes".
> (*Captain John Garner, Head of Operations, UK Maritime & Coastguard Agency)*

Tools such as the range and bearing tool make it easier to use the chart; facilitating quicker decisions from the team.

Tidal stream overlays can assist the risk assessment process and help determine the right course of action.

> "Without doubt the case where it was most useful was the ***Maria D.*** We plotted the drift of the ship, which was disabled in bad weather, and were able to demonstrate that she was going aground, despite the efforts of the master who was telling the MCA that he was in no danger of doing so. The claim has not been settled yet."
> (*Captain Mark Hoddinott, Salvage Manager, United Salvage*)

Tidal stream data can be projected ahead to help predict how a situation will develop over time.



Overlaying tidal stream atlases on charts

Electronic charts also remove the need to store out of date charts that take up valuable office space. Worldwide charts can be stored on the hard drive of a laptop.

3.2 Flexibility to respond to an incident

"My position as head of the Safety, Health & Environment Group makes me a person often called upon for advice or response to an emergency situation. However, I travel a lot in this job. Having the Navmaster Office system on my notebook computer is a great advantage to me as I can visualise the navigational area and situation, even whilst sitting at an airport somewhere waiting for a flight or attending a conference somewhere else, and give instant advice if necessary".
(*Captain Tony Antao, Head of Safety Group, Barber Shipmanagment)*

There is no need to visit the office to locate a chart, if the incident is out of hours. Fast access to charts, combined with the ability to plot the incident on the chart, is efficient and quick, compared to paper charts. Charts can also be networked, giving managers across a network the ability to see the same information.

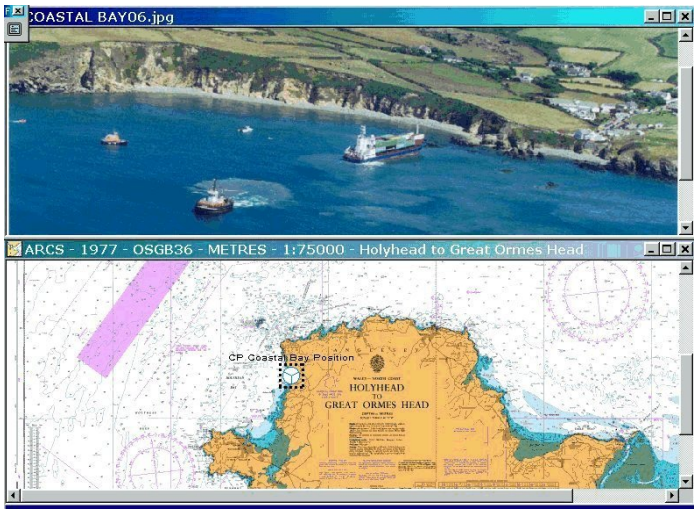
Extra charts can be purchased quickly by means of unlock codes which can be emailed, if you do not have the specific chart required for the incident.

3.3 Improving communication

Communication with team members during the incident can be improved through the use of a multimedia projector. The electronic chart can be viewed easily on a large screen, compared to viewing a paper chart at crowded table.

"In managing emergencies and pollution exercises a prime requirement is an accurate, up to date chart of the relevant area. The ability to display and manipulate this on-screen for wider appreciation is a significant bonus. A PC-based system overcomes the drawbacks of paper charts, has much to commend itself and is very cost-effective. Using Navmaster Office we now maximise our own effort."
(*Captain Peter Gill, Port Development Officer, Shell International)*

Other information can be attached to points on the chart; such as photos or notes. For post incident reporting, this improves the visual presentation of the report.



You can attach photographs to positions on a chart

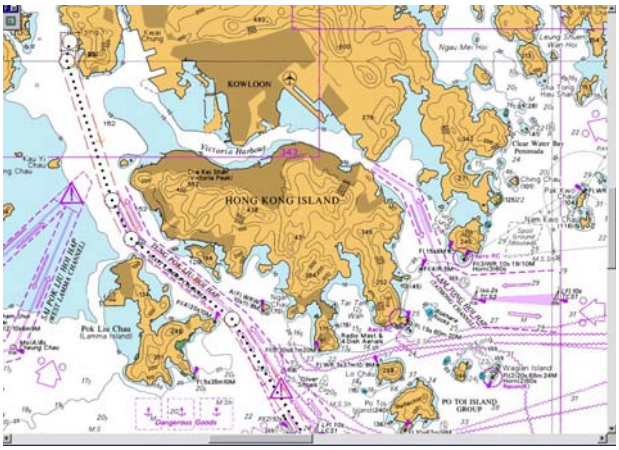
During post incident investigation, Navmaster Office can be used to:

- Replicate incident position and attendant factors
- Provide colour print outs of the chart for briefings
- Produce high quality reports

3.4 Route Planning

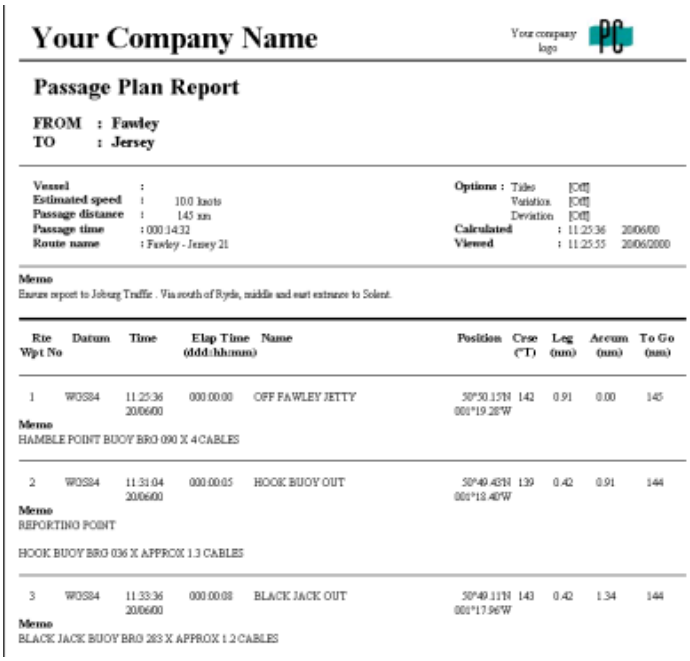
Using electronic charts for route planning reduces the amount of time needed to produce a route, to estimate the arrival of the nearest support vessel. Distance and bearing between waypoints are automatically calculated and can be re-calculated quickly.

> "The route estimating tool was used to estimate the distance from Felixstowe to Plymouth and to work out an ETA for our tug and salvage vessel."
> (*Captain Mark Hoddinott, Salvage Manager, United Salvage)*



Route planning with Navmaster Office

Navmaster's passage plan can be customised to include your organisation's logo.



Your Company Name

Your company logo

Passage Plan Report

FROM : Fawley
TO : Jersey

Vessel	:	**Options :** Tides	[Off]
Estimated speed	: 10.0 knots	Variation	[Off]
Passage distance	: 145 nm	Deviation	[Off]
Passage time	: 000 14:32	**Calculated**	: 11:25:36 20/06/00
Route name	: Fawley - Jersey 21	**Viewed**	: 11:25:55 20/06/2000

Memo
Enroute report to Jobsrg Traffic . Via south of Ryde, middle and east entrance to Solent.

Rte Wpt No	Datum	Time	Elap Time (ddd:hh:mm)	Name	Position	Crse (°T)	Leg (nm)	Accum (nm)	To Go (nm)
1	WGS84	11:25:36 20/06/00	000:00:00	OFF FAWLEY JETTY	50°50.15'N 001°19.28'W	142	0.91	0.00	145
Memo HAMBLE POINT BUOY BRG 090 X 4 CABLES									
2	WGS84	11:31:04 20/06/00	000:00:05	HOOK BUOY OUT	50°49.43'N 001°18.40'W	139	0.42	0.91	144
Memo REPORTING POINT HOOK BUOY BRG 036 X APPROX 1.3 CABLES									
3	WGS84	11:33:36 20/06/00	000:00:08	BLACK JACK OUT	50°49.11'N 001°17.96'W	143	0.42	1.34	144
Memo BLACK JACK BUOY BRG 283 X APPROX 1.2 CABLES									

Example of a Navmaster passage plan

Data can also be exported from within Navmaster Office to other Microsoft applications. This enables information such as a passage plan or a list of positions on a chart, to be emailed to a colleague in a standard format for access on any PC.

4.0 Conclusion

An electronic chart system can give a significant competitive advantage in responding to incidents. Electronic charts deliver improved efficiency to management processes. Quick access to a chart within 60 seconds gives the ability to make decisions quickly and formulate an appropriate contract to offer. An ETA of the nearest support vessel can be quickly calculated and changed, saving valuable time when dealing with an incident. It is only a matter of time before paper charts are superseded in this sector of the maritime industry by electronic charts. Paper charts simply cannot deliver the same benefits.

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