The Shape of the Future of ECDIS

1 July 2018 will be a historic date for chart navigation at sea, states Mathias Jonas in a recent article. On exactly this day ECDIS carriage requirement will be mandated for any new and existing vessel of relevant size on international voyages. This date, however, will not gain any particular reaction from those who are affected and this is due to the applicability and implicitness of technology. It is fair to say that this date marks symbolically that ship navigation has accomplished the principal shift from analogue paper charts to the era of digital chart navigation.

I was one of those who wrongly predicted the decline of paper charts ten years earlier. But now, after some delay, it is really happening. Sales of paper charts are in rapid decline and no longer even popular as a backup solution. I was recently told by a chart data and ECDIS vendor, that even the fall-back for the regular ECDIS double installation backup is no longer in paper on many ships. Younger mariners belonging to the digital generation, carry their private navigation app running on a tablet as a digital ‘take me home’ chart if all the professional bridge requirements fail. This actually tells us two things: firstly ECDIS has been tested as being robust and reliable, and, secondly, those mariners who are familiarised with digital chart technology don’t want to abstain from the obvious advantages – not even in an emergency case.

So, all said and done with ECDIS? I don’t think so. Actually, some (rather remote) areas are not fully covered with ENCs in appropriate scales; there are still problems with geographic overlapping and the quality of the underlying survey data needs improvement in many areas. These problems are the subject of various coordination efforts within the framework of the IHO activities. Many regional projects for resurveying by means of modern equipment are underway and ENC producing coastal states are constantly striving for improvements of the production workflow, quality assurance and update regime. But looking to comparable mobile navigation systems ashore it is obvious that ECDIS, as a concept, is no longer as modern as it used to be. It was once the very first of its kind, it is now lagging behind any modern car navigation device in the design of the user interface and functionality. Now would you like some evidence in favour? Well, as the term ‘Electronic Navigational Charts’ suggests, the now 30-year-old ECDIS concept has basically converted the chart paradigm into the digital sphere, almost only by digital treatment of the information provided on paper beforehand. This judgement applies to many details such as the scale concept, the geographic coverage of cells, the steps of depth contours, the symbolisation etc., which finally imitated more or less the look and feel of a paper chart on a computer screen.

There were comprehensive reasons for keeping similarity in visual content provision for the interim period of parallel use of both media paper and display, but noting the contemporary user’s requests it is clear that ECDIS needs another step in the way of transformation. What appears to be the predominant need from the users is for dense bathymetry and real-time application of tide water level. The concept to shape ENC cells mainly according to the corresponding paper charts should be revisited showing a regular grid. Amending text-oriented navigational information, which is still delivered by printed (or pdf) sailing directions, should be naturally embedded into the traceable database of the ECDIS device. Information overload on display? Well, automated interpreters should trace all information continuously, evaluate for the specific situation of the individual vessel and display the relevant information only. If it eventually comes to guided or fully autonomous vessel operation there will be a much lesser need for information getting displayed visually. Instead, the highly automated surveillance mechanism should gain access to supplementing marine information provided by neighbouring domains such as meteorology and oceanography. Future ECDIS will have to manage the full set of our maritime knowledge to create the biggest, most up-to-date, most detailed image – not necessarily visually but ready for automatic processing. This goal has to be addressed in two ways: technically by standardisation and intellectually by closer collaboration of all contributors affected: IGOs such as IMO, IHO and IALA along with their Member States, industry, science and academia. The IHO is targeting this ambition in all fields of standardisation, capacity building, education and cooperation activities. It will be exciting to see how the implementation of IMO’s e-navigation strategy will impact the shape of future ECDIS devices.