

# HYDRO INTERNATIONAL INTERVIEWS DR LEE ALEXANDER, UNIVERSITY OF NEW HAMPSHIRE, USA

## Revival of ECDIS?

In 1996, an ECDIS conference titled "Five years of Broken Promises" dealt with the non-availability of ENC data. At the 2nd International ECDIS Conference in 2003, a prominent speaker from the user community stated: "Give me ENCs, not excuses." Despite high expectations, much effort, and many meetings, ECDIS still is not operational. What went wrong? More important, what needs to be done? Was it the misperception that an ENC is equivalent to the paper chart?

You were with electronic charting from the beginning. Could you give a brief summary of your ECDIS life?

My formative years were as a young U.S. Navy officer interested in navigation and driving ships. After leaving active duty in the mid-1970s, I went to graduate school to study habitat mapping and the early development of GIS for natural resource management. However, I stayed in the Navy Reserve and became involved in the use of GPS for mine warfare missions. Combine marine navigation with GIS and GPS, and this was the start of my involvement in electronic charting in the late 1980s. Since then, I have been actively involved in electronic charting both by choice and circumstance. First as a R&D Scientist for U.S. Coast Guard, then a Visiting Scientist with the Canadian Hydrographic Service, and now at the University of New Hampshire.

Can you tell us about your University, and your present activities?

I am a Research Associate Professor at the Center for Coastal and Ocean Mapping – Joint Hydrographic Center (CCOM-JHC). In cooperation with the National Ocean Service - NOAA, CCOM-JHC is a national centre for expertise in ocean mapping and hydrographic sciences. There are two main activities: 1) an educational program to train the next generation of hydrographers and ocean mapping scientists, 2) a research facility that develops state-of-the-art hydrographic and ocean mapping technologies. For me, I conduct applied research, development, test and evaluation of electronic chart-related technologies.

Do you understand the users lamentation "Give me ENCs, not excuses"?

Yes, I share their frustration. But, this is a HO production issue rather than research-related. I have concerns about the ability of some HOs to provide official ENC data and services that IHO decided was required. Also, the impact this is having on the credibility of IHO and its member states. Many mariners are using unofficial electronic chart data/service and seem quite happy doing so. Even if they wanted to use official ENCs, there is not worldwide coverage.

Regarding worldwide ENC coverage, Horst Hecht's recent article: "The Future of ECDIS" (July/August 2004) presented a slowly progressing situation. Do you agree with him? Do you think HOs are up to the challenge?

I agree with Horst's assessment of the current situation, but I have a different opinion about the way forward. The primary role of a HO is to provide nautical information to ensure safety of navigation. To do so, required three steps: 1) hydrographic surveys, 2) database management, and 3) production of products and services. Each step is a government responsibility, and HOs need to be provided adequate resources to accomplish. But, how each step is performed is changing with outsourcing becoming more prevalent. Rather than the traditional "we and they" approach, HOs and the private sector must look to establishing co-operative arrangements. For ENCs in particular, leave it to the private sector to figure out the best means to provide value-added services to end-users.

Do you believe in a "paperless bridge" or a paperless office? Or should we better listen today to the mariner for whom the perfect solution might be far overdone?

A "paperless bridge" such as a paperless office, is a bogus concept. As a German naval officer remarked: "A paperless bridge makes as much sense as a paperless toilet." You can do it, but you will not be happy with the results. Rather than being preoccupied with reducing paper, the focus should be on how electronic charting is an entirely new approach to marine navigation. As stated by a US Coast Guard Officer in the early days of ECDIS, "A paper chart shows you where you were, or shouldn't be. ECDIS tells you where you are and can safely go."

Is ECDIS supposed to replace the paper chart onboard ships, like Internet was supposed to replace printed post mail? Is it a question of experience and training?

Any more than we need a “paperless bridge”, the idea that ECDIS will replace paper charts should be rejected. The Internet does not replace post mail. Instead, it is an entirely new means to send, receive, and gain access to enormous amounts of information – digitally and almost instantaneously. We should regard ECDIS in the same way. As to ECS/ECDIS users, they are a lot smarter than many realise. For instance, many mariners use ECDIS in combination with paper charts – on purpose. ECDIS is superior for tactical, real-time navigation and situational awareness, while a paper chart is very effective for planning and look-ahead.

ECDIS can display more and more information: AIS, radar, weather, tidal information, etc. Potentially, this could obscure the main purpose: safe navigation. Should there be a requirement for more displays?

In ECDIS jargon, this supplemental information is called Marine Information Objects (MIOs). Supplementary means non-mandatory and in addition to that required by existing ECDIS standards. Since MIOs can be either chart- or navigation-related, an IHO-IEC Harmonisation Group on MIOs (HGMIO) was established to deal with data content and display issues. As the Chair of HGMIO, I can report on progress made related to ice, weather, and oceanographic information. Recently, there is an initiative by NOAA to develop MIOs for coral reefs. In regard to display requirements, this matter is currently being addressed by IMO and IEC. The goal is a harmonised display of all navigation-related information (both chart and operational).

Their monopoly position on the “official” chart might lure HOs in high ENC pricing, slowing down the introduction of ECDIS for the user. How could the financial threshold be made acceptable for users and HOs?

I have an entirely different opinion about ENC pricing. First, it is a HO’s responsibility to produce ENC data to ensure safety of navigation. This has nothing to do with monopoly or financial threshold. Second, official ENC data has no value until it is used (e.g., in an ECDIS). Rather than trying to price ENC data, HOs should make it freely available. If cost-recovery or revenue is necessary, then just charge for ENC usage on a per ship basis based on the amount of data coverage required and how often it was used. This works pretty well for mobile phones, it should also work for ENCs.

What about GIS? Is the hydrographic world taking advantage of the benefits of GIS technology?

In reality, ECDIS is a real-time GIS, optimised for maritime navigation. However, this is not widely recognised since many remain preoccupied with “paperless bridge” and paper chart “equivalency”. In addition to electronic charting, there are other hydrographic applications that would benefit from an increased GIS focus. This includes coastal zone management, seafloor classification, and marine environmental protection. Fortunately, there is an ongoing process within the IHO CHRIS to align the next edition of IHO S-57 (Edition 4) with the ISO TC211 suite of spatial standards. Ideally, this will facilitate greater use of digital hydrographic data beyond that required for ENCs.

You always claim to be a mariner, rather than a hydrographer. Nevertheless you attended many hydrographic conferences and meetings all over the world. Can you explain?

I am a mariner by training and experience, who is now a scientist in the field of hydrography. As I wrote in my first “Thinking Like a Mariner” column for *Insiders View*, I consider hydrographic data and services as “tools” that enable mariners to make informed decisions about how to safely navigate a vessel. When I write an article or give a paper at a hydrographic conference, I try to stress why hydrographic information is important, and how mariners will use it. Like the book by David Brinkley (a respected American Newscaster), “Everyone is Entitled to My Opinion”.

In closing, is there any message you want to get across?

We need to take a hard look at what ECDIS is and is not. Our vision of 10 years ago did not become reality. A type-approved ECDIS is not a carriage requirement and even if it was, there is limited ENC coverage that inhibits its use. Mariners now feel that less-than-full ECDIS provides a good solution at an acceptable price and service level. Most of this is provided by the private sector. If/when ENC coverage does become a reality, mariners will want better ENC data than that digitised from paper charts. Ideally, this will be produced from new/better surveys. Also, the “Next Generation ENC” should provide information in four dimensions: x,y,z, and time. Paper chart equivalency and a paper-less bridge is regressive thinking. We need to look to the future.