Is Modern Digital Navigation a Profession?

The US Congress passed legislation to preserve national infrastructure as a back-up for GPS on 4 April 2014; spookily the Russian GLONASS system suffered an almost immediate 11 hour outage. This is possibly the first time that an entire GNSS constellation failed - rumours abound that it was due to a solar storm, a cyber-attack or corrupt data. The vulnerabilities of space-based PNT (position, navigation and time) systems cause much debate beyond this Insider's View – the point is that a GNSS system can and did fail. So what is the takeaway for the hydrographers, cartographers and navigators of our digital era?

Digital navigation is truly with us, we are about halfway through the IMO's timeline for ECDIS mandation and transitioning to paperless bridges in steadily increasing numbers whilst the same technology has been adopted by wider society. Advanced societies are increasingly dependent on the internet, laptops, tablets and smartphones, which also fuel the rapid growth of developing economies such that many governments cite PNT as a component of critical national infrastructure. How well have the 'operators' of those handheld devices been trained to use them; do these 'digital immigrants' and 'digital natives' truly understand the capabilities and limitations of their ubiquitous systems? More parochially, are we adequately training our hydrographers, cartographers and navigators (our seagoing 'digital immigrants' and 'digital natives') as professionals of the era of maritime digital navigation and operations, or are we relying on them 'picking it up' just as they did at school and university?

Paper chart and navigation technologies evolved over centuries; our forefathers surveyed unknown waters with lead-lines and visual fixes, refined accurate timepieces, developed celestial navigation, conceived dead reckoning and estimated positioning techniques creating chart formats and back-up systems in perfect balance with the extant navigational techniques. The hydrographers and cartographers at the time were in a near perfect partnership with their navigational counterparts at sea (indeed many individual mariners were proponents of all three skills).

I am not convinced this is so in the digital era where the conventional supply chain of navigational products and services has been disaggregated by technology. OEMs provide around 30 different type-specific ECDIS systems and HOs are building ENCs from digital databases that are hosted on different kernels so that today's hydrographers and cartographers are unlikely to know how their products are displayed and used by their seagoing operators. Those operators can fundamentally modify what they see on their ECDIS displays and there is growing evidence that some captains, navigators and deck officers are wholly reliant on GPS and PNT.

I am not naysaying the training provided by the world's maritime institutes, or the standards set by national and international authorities. But I am questioning whether we, the international maritime community, really understand the capabilities and limitations of digital navigation technologies; and whether we are truly and effectively transferring the hard-won professional navigational lore, healthy wariness of technology and the seaman's eye of the analogue era to our digital successors?