

## Opinion: **Back to the Future for e-Navigation?**

By Paul G. Kirchner

The IMO's e-navigation strategy initiative is now eight years old and, according to a Strategy Implementation Plan (SIP) currently being drafted by the Correspondence Group guiding the initiative, will continue for at least the next five years. And that's just the "first iteration." The draft SIP envisions future stages utilizing the same development cycle of user need surveys, gap analyses, solution and risk control proposals, formal safety assessments, cost benefit analyses, human element and usability evaluations, test beds, etc., all under the supervision of IMO.

The initiative has expanded well beyond its original goal, become loaded down with parochial interests and agendas, and has spawned its own mini-industry that

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seems more interested in the process of the initiative than in its intended product. Those outside of this strategy development industry, especially mariners and ship operators, have been justified in wondering if anything concrete and beneficial will eventually emerge. As the e-navigation world envisioned by the current leaders of the IMO's initiative comes more clearly into focus, however, it may be time to start asking a more fundamental question: has the concept of e-navigation been hijacked by interests that are unfriendly to ship operators and mariners and lack sufficient understanding of ship navigation?

Let's begin the discussion by reviewing the promising start to IMO's work on e-navigation. In 2005, eight countries, including the United States, submitted a paper to the IMO's Maritime Safety Committee proposing that the organization "develop a strategic vision for the utilization of existing and new navigational tools, in particular electronic tools, in a holistic and systematic manner." Citing the "evergrowing and complex set of technological aids which already exist," the paper expressed concern that new "advanced" navigation technologies were being developed in an uncoordinated way. This reflected the experience of mariners who had to deal with new equipment on the bridge that wasn't integrated with other

pieces of equipment, was not user-friendly, provided information that was not relevant, and was more of a distraction than a help.

The IMO agreed to the proposal and established the "development of an e-navigation strategy" as a work item with a completion date of 2008. Importantly, the proposal did not seek to encourage or accelerate the introduction of new technology or usher in a "new paradigm" for ship operations. Its aim, in fact, was to restrain and control the introduction of new technology to ensure that it would be done in a more coherent, coordinated, systematic way with greater concern for the needs of the mariners who would be using the technology.

This proposed project had much to offer mariners, both ship's crews and pilots. It envisioned navigation systems that would be user-friendly and intuitive, that would reduce – not increase – the mariner's workload, and would facilitate situational awareness and error prevention/detection. Pilots, already familiar with advanced electronic tools through their experience and expertise in PPIs, could gain from improved, and perhaps complementary, equipment on ships and more information from ashore accessible through their PPIs. They also could look forward to crews that had more usable equipment with which they could feel comfortable and, therefore, more capable of participating in the navigation of the ship in pilotage waters.

The 2005 proposal also did not envision fundamental or even significant changes in the way ships are navigated or in the role of mariners on ships. Early in its work on the strategy, IMO stressed that the human element



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should be the paramount consideration in the development and implementation of navigation technology and that e-navigation should be driven by user needs. It was assumed at the time that mariners would be the humans whose needs were to be the predominant focus of the strategy. That has not always been the case, however.

In fact, the IMO's e-navigation effort today has more to do with shore-based authorities and their objectives. As the initiative moved forward, the focus shifted from improving the tools available to mariners to meeting the desires of shore-side authorities for a greater role in ship navigation. This has not been a well-kept secret. For example, at an e-navigation conference in 2012, the chairman of the IMO's e-navigation Correspondence Group stated that the "key elements" of e-navigation "include enhanced vessel traffic management from ashore." Similar statements have been made at other conferences and meetings.

This drift of IMO e-navigation efforts toward shore should not be surprising. The people dominating those efforts are connected with VTS operating entities from Northern Europe (a current joke is that the "e" in e-navigation stands for "Euro") and a handful of other countries that have a much more expansive view of the function and role of VTS than the United States, Canada and other major maritime nations. In addition, IALA, an organization of governmental entities providing aids to navigation, VTS, and other related shore-based services, has had significant input into the IMO e-navigation initiative and seeks an even greater role in the future.

At *Pacific Maritime Magazine's* eNavigation Conference 2013 held in Seattle last November, Mike Sollosi, chief of the Coast Guard's Office of Navigation Systems, assured the attendees that "the Coast Guard does not see electronic navigation as an enabler of shoreside control of a ship." He acknowledged, however, that others involved in the IMO initiative may have a different view.

Whatever the merits of shore-based navigation, whether under that name or its current euphemisms "Enhanced Vessel Traffic Management" or "Sea Traffic Management," it is not an inevitable product of the integrated marine information system that e-navigation envisions. It is not e-navigation. Nor should it be the goal of e-navigation. Advances in information and communication technology both onboard and ashore will undoubtedly make some level of enhanced information exchange between ship and shore possible, but that doesn't mean that navigation of ships by individuals sitting in front of a screen miles away from a ship is a good or safe thing. An often-expressed but seldom followed admonition reminds us, "Just because something can be done, that doesn't mean it should be done."

Another manifestation of this shore bias in the e-navigation initiative strategy was the much-discussed effort to re-imagine the role and training of navigators from being "navigating navigators" to being "monitoring navigators." While this was ultimately rejected, the underlying view

persists that navigation decision-making should be moved from ship to shore and that the essence of navigation is adherence to a predefined voyage plan entered into a ship's integrated navigation system and monitored from shore.

Providing information from shore, exchanging data and information among ships and shore entities, and developing an integrated information network accessible to users according to their needs are all important components of e-navigation. Their primary importance, however, lies in what they offer to the mariner. Therefore, shore-based entities have a legitimate and valuable role in e-navigation in terms of the support they can provide to mariners, and the initiative rightly addresses their information exchange needs. But e-navigation should be about more than expanding the ability of shore-based authorities to monitor, manage, and control ship movements.

So, what should be done, either within the IMO or outside of it – to deliver on the original promise of the e-navigation concept?

First, the ship operating industry needs to become more involved. The IMO's e-navigation initiative is no longer simply about improving navigation technology and enhancing information resources. It has become a much more expansive attempt to remake marine transportation. Its impacts will extend beyond ships to all facets of ship operations, including management responsibilities and liabilities.



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Second, e-navigation should be refocused on the needs to mariners. Before any proposed e-navigation solution or project is advanced, the starting question should be: how will this help the mariner safely navigate a vessel. A very useful set of guiding principles for answering that question already exists but, strangely enough, has been largely ignored by the IMO initiative.

According to SOLAS chapter V, regulation 15, decisions regarding required navigation systems and bridge equipment, such as ECDIS, AIS, GNSS, radar, etc. must be taken with the aim of facilitating the tasks of the bridge team and the pilot in safely navigating the vessel. It lists seven specific goals that must be considered in the design and arrangements of navigation systems and equipment on the bridge and bridge procedures. The goals are all associated with bridge resource management, including enhanced situational awareness, error prevention/detection, effective information processing and decision-making, and distraction and fatigue avoidance. While the draft SIP correctly identifies Human-Centered Design and Usability as important concepts for navigation technology, those are merely implementing devices for the mandate of SOLAS V/15.

Third, IMO and IALA should abandon their central-planning approach to e-navigation. They should recall that the 2005 proposal was for IMO to develop a strategy for e-navigation, not to create it or micro-manage it. That strategy was set in 2008 when the IMO adopted the definition of e-navigation proposed by IALA: "the harmonized collection, integration, exchange, presentation and analysis of marine information onboard and ashore by electronic means to enhance berth to berth navigation and related services for safety and security at sea and protection of the marine environment."

It would have been better if the IMO had stopped there. The strategy embedded in the definition could have been reformulated as a governing principle for all of the IMO's normal activities, such as developing carriage and training requirements, operational regulations, performance standards, and guidelines. After that, any IMO activity would require a finding of consistency with the e-navigation strategy.

Think of how much good and valuable e-navigation progress could have been made since then, instead of waiting for an all-encompassing IMO master plan for marine transportation in the information age. **PMM**

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