The Simulator and Training Article

Regulatory imperatives concerning training and vessel operation, have converged with technology (particularly advances in processing power, surveillance, monitoring and communications) to create a perfect storm of powerful training tools for mariners, delivered ashore and onboard.

The training business is complicated, but has fundamentally been driven by successive regulatory waves requiring Flag States to assure that Mariners gain training in a host of disciplines. Education is offered by hundreds of training centers of all types, including maritime academies and technical universities. Three decades after the advent of the first simulators, the once sleepy training business, has morphed from blackboards into "computer based training". Consider that Sperry Marine’s New Malden (UK) training facility instead offers a “Smartboard”- for interactive simulated scenarios.

For regulatory and management topics where heavy duty bridge or engine room simulator work is not required, the method of choice has become “distance learning” in the form of videos, interactive CD Roms, and now DVDs packed with mpeg files. With more processing power aboard vessels, desktop simulation packages designed to run on local PC’s, such as the desktop capabilities of Kongsberg’s Polaris 4.4.0 or the Transas TGS 4100- a GMDSS tutoring package, are gaining market share.

It is no coincidence that simulator leaders Transas and Kongsberg are both active across a wide swath of the maritime electronics businesses. Transas is a leading provider of AIS transponders, electronic charts and traffic management systems. Kongsberg Marine (the subject of a buyout bid earlier this year) is also known for its traffic management systems as well as maritime automation and gauging products.

Kongsberg

The success of Kongsberg Maritime, is evidenced by the 130 + full mission simulators placed with “…colleges, maritime institutes and Navies.” For commercial shipping, Kongsberg offers its Polaris 4.4.0 bridge simulators - which
runs on full-blown simulators installations, or PC based desktop simulators. Enhancements in the latest version include a strong dose of realism to the simulation environment- for example, an AIS simulator is tied to the bridge display. Earlier this year, Kongsberg announced that the U.S. Naval Academy and two U.S. Navy bases had installed its bridge simulators.

The holy grail of simulation is an authentic look and feel. The emulation of realistic shipboard environments has driven the latest modifications to the Polaris line- including links to voice and radio communication systems, a radar overlay on an ECDIS display, and new simulations panels and displays. Kongsberg also offers its “Neptune” line of engine room simulators, which are based on specific engine types such as Sulzer, Man and Pielstick for vessels ranging from small catamarans to large VLCC’s.

Kongsberg’s simulator user group meeting, held in Singapore during late September, pulled in more than 50 customers and business partners who spent two days discussing “Improved Learning Results from Simulator Based Training.” The session included an exercise where the bridge and engine simulators were tied together, breakout workshops and a discussion of “E-coaching”- how coaching of students could be done remotely.

Transas offers a huge array of products aimed at merchant shipping, including its TX 97 brand of electronic charts, has its simulators in over 300 training centers around the world. Transas’s line of simulators cover the bridge, engine rooms, and GMDSS. Bridge capabilities, on units like the Navitrainer 4000, include ship handling, ARPA/ Radar and operability with ECDIS. The engine room simulators include a full mission unit including control panels for diesel propulsion, electrical power plan and auxiliary machinery (the ERS 3000), a networked PC version (the ERS 2000), to a standalone desktop enginer control room simulator (the ERS “Solo”).

This past June, at Posidonia, Transas rolled out Virtual Ship Simulation Concept, where the Navitrainer 4000 and the ERS 4000 are married together. In the Posidonia presentation, Transas added a GMDSS capability, a liquid cargo handling simulator, all tied together with Transas proprietary visualization technology. The virtual engine room enables crews to familiarize themselves with operations and with local controls- it even includes sound! The new high performance version of the Navi-Trainer allows companies to satisfy their ISPS obligations to train officers in AIS (including Transas models) and SSAS (including Transas and Satamatics units). Transas has built an evaluation and assessment system into the Navi-Trainer, which can aid in the management of training.
Transas’ market reach has broadened, with simulators for new types of vessels, such as Survey Vessels and Offshore Supply Vessel (OSV). The St. Petersburg Naval Institute has taken a unit that will provide training for vessels doing underwater topographic mapping, while Louisiana Technical College, near the U.S. Gulf, has taken an OSV simulator. Recent marketing successes for Transas also include Zhoushan Navigational School / OOCL and Guangzhou Maritime College, which both took NaviTrainer 4000 units, as did the Rauma Maritime Museum and Delgado College (New Orleans, USA).

The US Military Industrial Complex: Northrup Grumman / Sperry, L3 / MPRI

Sperry Marine, part of Northrop Grumman Corporation, has recently received a contract from MPRI Ship Analytics International, a subsidiary of L-3 Communications, to supply an integrated bridge system for a training simulator for the Arab Academy of Science, Technology and Maritime Transportation (AAST) in Egypt. The simulator will be used to train AAST’s students in navigation and ship handling- using Sperry’s integrated bridge system technology.

The simulator will offer a functional ship bridge, including radars, navigation stations, heading and speed sensors, autopilot, steering system and other components, including a multi-console Voyage Management System with IMO compliant ECDIS system. The bridge equipment will be integrated by MPRI Ship Analytics into the training simulator, which will be delivered to Egypt by the end of 2004. MPRI is a supplier of real-time simulation systems for commercial marine and naval applications. Additionally, Sperry offers simulator training on its “Vision FT Integrated Bridge System”, through training centers in the USA, UK, Denmark and Germany. MPRI, which has served the US Coast Guard, Navy and Maritime Administration, is based in Connecticut (USA), but its international reach has included Warsash Maritime Academy, where MPRI cooperates on the “SafeCargo” liquid cargo handling simulator.

Seamanship

An important participant in the distance learning sector of the market is UK based “Seamanship International”. With offerings ranging from Rules and Regs on CD, multi-media CDs that offer a proprietary intelligent assessment’ system, through to consulting and customized training, Seamanship takes a thoughtful approach to training. Successful completion of the remote learning programs, where students can learn from their wrong answers working within a field of some 10,000+ questions, can enable ship’s officers to qualify for requisite endorsements needed under the STCW convention. One of Seamanship’s more recent projects provided an
assessment driven training program used to validate compliance with the ISM Code, which requires that training is provided in support of the company's own Safety Management System and recorded in crew members' files.

Seamanship’s Managing Director, Mr. Iain McNeill, commented, ““As operators focus on the importance of integration between training and the assessment of competency as a way of better management of the skill gaps in professional development, Seamanship’s understanding and experience in this field will be able to assist greatly.” Administrative modules allow individuals' progress on self administered exams to be recorded and transmitted to head office. Successful completion of these courses enable ship’s officers to qualify for requisite endorsements needed under the STCW convention. Seamanship is working closely with Shell Oil on a project where onboard training coaches will be able to assess and manage the training needs of individual officers.

**Videotel**

Advancing technology has moved the products forward. On the training side, consider the new Video on Demand product from Videotel, where a computer loaded with 500+ instructional videos is placed aboard vessels, and is accessible by crew through customized modules. The system, in use aboard P&O Nedlloyd vessels, contains administrative software to monitor the training activities of crews, organizes the enormous amount of Videotel material in ways that are unique and useful to clients. “The crew can instantly find out how to deal with any problem or weakness that arises onboard or within the fleet at short notice,” according to Videotel’s General Manager, Mr. Mike Potts. Data management technology has also influenced the business model, supporting a "pay as you go" variable pricing model. 55 courses from Videotel have recently won recognition from the UK’s Institute of Marine Engineering Science and Technology, as being suitable for Continuous Professional Development (CPD) certificates.

**Seagull**

Another important provider is Seagull, based in Norway, best known for its work with the Teekay Shipping’s DNV-certified “Seafarer Competence for Operational Excellence”. Seagull provided the computer-based training modules and training administrator. According to DNV, “The program goes well beyond legislative requirements for certificates of competency and includes Teekay Competencies; Management / Leadership Behaviour Competencies; Overall Knowledge and
Understanding; Aptitude; Experience; and Attitude and Motivation.” Seagull has also undertaken other Class certified training modules for Teekay and other owners, including Ballast Water Management, which combined the computer training module with a workbook. Most of Seagull’s courses, spanning areas including navigation, cargo operations, engineering, and many others, are provided on CD Roms that run on computers.

Seagull offers a Competency Evaluation System (CES 4.2) using STCW tests based on rank and department along with administrative capabilities for human resources managers, drawing on a database of 5000+ questions. The CES 4.2 has recently been updated to include questions related to knowledge of the International Ship and Port Security (ISPS) code. Seagull’s unique Administrative features enable to customize the actual tests and to generate management reports for tracking the progress of individuals and vessels.

**SeaSecure, Moxie, Maritime Training Service, AMSEC**

The expertise of Florida-based SeaSecure is on all facets of maritime security, with clients ranging from government agencies and ports to shipowners. In a joint development project with Moxie Media, Inc., a developer of maritime training videos (these days burned into CD Roms in mpeg format), SeaSecure has created security training videos for in-house training requirements of the IMO’s ISPS Code and the US legislation aimed at Company Security Officers and Ship Security Officers. According to SeaSecure, the course content is also used at the World Maritime University in Malmo, Sweden. Moxie Media also offers maritime training videos on diverse topics ranging from fire fighting to the characteristics of hazardous cargoes.

Maritime Training Services, based on the U.S. West Coast, provides its materials either via tape or DVD, for sale or for rental. It also offers CD-Roms designed for more interaction between the trainer and the student. New topics are, not surprisingly, focusing on ISPS items- such as methodologies for searching baggage and cargo compartments.

Not active in the commercial training space, but worth mentioning, is AMSEC-tied to Northrup Grumman (the parent of Sperry) and SAIC. AMSEC provides interactive training and visualization capabilities aboard vessels, using sophisticated graphics programs that run on the onboard computer networks found on U.S. Navy vessels.

**Trends and Drivers**

Videotel President William O’Neil, the ex Secretary General of the International Maritime Organization spearheaded the organization’s all important STCW and ISM initiatives in the ‘90’s, and then into maritime security with the ISPS code. Each successive regulatory foray generated requirements for an additional
training. STCW was a watershed for simulators because they are mandatory to demonstrate competence in radar use and radar plotting (ARPA).

Another significant driver and differentiator for information businesses is what the gurus call “Mass Customization”, where bespoke offerings trump traditional “one size fits all” approaches. Consider that simulator operator Marine Safety International (MSI), a division of Flight Safety International, can offer “… can prepare a model for any ship to be used in training or testing.” In a similar vein, Transas refers to the “open architecture” as the key enabler of customizing the integration its ERS 4000 into the programmes of customers in various maritime centres. Many training centres offer company specific programmes.

Consolidation has been impacting all parts of the maritime industry, new forms of organization have crept into the training business. Kongsberg, in conjunction with a Norwegian research group, MARINTEK, has been working with a consortium of Norwegian owners, Begesen, K.G.Jebson, Odfjell and Neptune Shipmanagement, and three Singapore and Philippine based simulator operators on “Improving Retention of Simulator Based Training” (colloquially, the conclusion is “use it, or lose it”- simulator training must be reinforced by actual onboard applicability). Meantime, another force for standardization can be seen in “Seaskill” a DNV certification program for courses and training providers. Both Seagull and Videotel’s Ship Security Officer (SSO) courses carry the imprimatur of DNV approval.

Another trend has not yet coalesced. While the internet in the sky is still too expensive for training to be delivered remotely aboard vessels, major players have studied the issue. Videotel’s Mike Potts said: “we have looked at this but at the moment the price precludes it from being a viable option for our clients.” Meantime, Sperry has signed a contract to repair Invsat VSAT systems. Can it before too long before training begins to move through the Invsat pipeline?

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