Simulating reality for virtual benefits

The use of computers in the training of seafarers has had a surprisingly long history. Computer based marine simulators started to make headlines as early as the mid-1970s. This is when suitably powerful computers started to become affordable for institutions to use them as a training aid. Since then the capability of simulators has become awesome as the power/cost ratio of computers has continued to rise steeply.

The power and flexibility of today's desktop or notebook computer greatly overshadows that of the expensive 'mini' computers that were used in the early simulators. The PC has become a familiar tool for many seafarers for both work and leisure activities. In particular PCs are being increasingly used to run computer based training (CBT) software at sea and onshore to complement traditional shore based training.
Some CBT packages now include inbuilt simulation of marine instrumentation. Of course theses simulators do not compete with the dedicated shore-based simulators connected to 'real' controls and 'surround vision' graphics but nevertheless provide enhanced training possibilities.
Many maritime administrations actively encourage the use of CBT and even endorse courses. A recent project within the UK MCA developed a 'blueprint' for Electronic Chart Display and Information System (ECDIS) CBT training and concluded that: "The development of a CBT package in line with the blueprint established by the project has significant potential to deliver measurable, achievable training in the use of ECDIS …"

Reinforced training
It is self evident that seafarers require good training. IMO reinforces this by its requirements given in the International Convention on Standards, Training, Certification and Watchkeeping for Seafarers (STCW). In addition the International Safety Management Code (ISM) requires that effective training is given within a properly structured and documented environment.
Fulfilling these standards on training is a very demanding task for the ship management company engaged in international trade. Course, travel and accommodation costs and the actual time involved for individuals to attend shore-based training become very significant items. The introduction of new technology on board vessels is increasing at an ever accelerating rate, consequently increasing training requirements.
CBT can be used on the ship, in the office, at home or while travelling and so removes much of the conventional costs of training. It is good for getting to grips with requirements and regulations and understanding principles, such as navigation. It is useful for many aspects of training in liquid cargo handling, engine control, GMDSS, radar and ECDIS, particularly as it can include elements of simulation.
It has a potentially invaluable use ensuring that seafarers become familiar with the actual systems they will be using on vessels before or on joining the vessel. Familiarisation using cascade training (where incoming crew members are familiarised with the equipment on the vessel by existing users) is found to be an ineffective training strategy on more complex systems such as ECDIS and integrated bridges (IBS).
It is important to realise that CBT is not a total replacement for conventional training. The latest phrase in teaching "blended learning" reflects this. The use of simulators, CBT, classroom teaching, reading, and all else form part of the learning process, with some aspects of a course often more suited to a particular delivery mechanism. It

should also be recognised that individuals have different success rates depending on the method of delivery and not all benefit by the CBT format.

Electronic classrooms

The nautical training colleges make extensive use of computers in their training packages. For instance the Warsash Maritime Centre in the UK has a number of simulators including a full mission bridge simulator and liquid cargo, engine room and comprehensive radar simulators. Warsash has been in the forefront in simulators for maritime training since the technology took off. In 1978 they hosted the first international conference on marine simulation (MARSIM '78) and since then have been involved in both the design and operation of marine simulators.

Their liquid cargo operations simulator (LICOS) represents the controls, equipment, machinery, instrumentation and alarms of numerous types of carrier, including LNG, LPG and VLCC. It was developed in conjunction with MPRI Ship Analytics and forms part of that company's WISE Cargo product. The other major component of WISE Cargo is the monitoring and feedback system. This is an expert system that takes the place of an instructor. It provides both training and operational feedback to the student and also provides assistance in assessing the student. This makes the package very suitable for remote use as part of a CBT package.

Compared to the age of the industry, Transas is a relative new comer to the simulation world. However over just few years it has built itself into probably the largest supplier of marine simulators in the world. These go into training colleges and increasingly into ship operating company training facilities. Their extensive range includes bridge simulators, (from full mission ship handling to ARPA and ECDIS trainers), GMDSS, engine room and liquid handling simulators. Impressive Transas simulator demonstrations are to be seen at virtually all large marine equipment exhibitions.

One of the well known names in distance training of seafarers is Videotel. Their courses, once primarily on video tape, are increasingly utilising all the capabilities of a modern PC, combining video, animated graphics and sound with software based interaction. They work closely with nautical colleges, administrations and seafarers to ensure the suitability of their distance learning products. Of particular interest are courses designed around the relevant IMO Model Course. A number of courses are designed for the tanker market and their new Tanker Familiarisation course is specifically aimed for anyone starting to serve on a tanker or transferring from another vessel type.

Another well known and respected name in CBT for seafarers is Seagull. Several of their courses are specifically designed to shorten or to avoid the need for shore-based courses. An example is their Oil/Chemical/Gas Tanker Highest Grade Course, which is approved by the Norwegian maritime administration and reduces the shore based course from 5 days to only 1 day. Formal approvals for many other courses have been obtained from marine administrations and classification societies and they work very closely with South Tyneside College in the UK and the Willem Barents Maritime Institute in the Netherlands.