SEAFARERTRAINING

Surpass the test

Academics are aiming to improve the training of seafarers in onboard automated systems. **Professor Reza Ziarati, Dr Martin Ziarati** and **Ugurcan Acar**, of the maritime division at the Centre for Factories of the Future, explain all...

The research project demonstrated the need for seafarers to be able to operate automated systems in normal conditions as well as emergency situations Picture: Danny Cornelissen

Automated systems onboard merchant ships have increased significantly in recent times — and so have the number of automation-related incidents and accidents.

Recent research by a partnership of European maritime organisations through an EU-funded project called SURPASS demonstrated the need for seafarers to not only be able to operate automated systems in normal conditions but also in emergency situations, as many accidents are caused by the inadequate response of seafarers in both normal and emergency situations.

Research carried out by the UK Maritime & Coastguard Agency concluded that maritime resource management training (MRM) could be an important way of improving the response to automation failures, and SURPASS partners stressed that it is of paramount importance to improve seafarer training in automated systems.

Whilst onboard technology is changing rapidly, the project questioned whether the Standards of Training Certification & Watchkeeping (STCW) Convention has kept pace. 'How can we use and manage automation effectively if the content/standards for education and training of ship officers have remained the same?' The question posed is, are maritime education and training (MET) institutions really able to give their cadets a meaningful education and training that fulfils the demanding requirements set by the latest automation technology?

> "Whilst onboard technology is changing rapidly, the project questioned whether STCW has kept pace"

'And what about those seafarers who have got their education some 20 years ago? Are they able to cope with often complex instrumentation and control systems which are now mostly computer-based, as seen on new ships with different degrees of sophisticated automated systems?'

The project analysed a number of automation accidents to help unearth the answers. One case it highlighted was 8,400TEU the containership Savannah Express, which suffered serious damage when it struck a linkspan in Southampton after losing its astern power while trying to berth in July 2005. Although the engineers onboard were experienced and held appropriate STCW certificates, they were not able to diagnose the reason for the engine failure because they had not received any formal training in the operating, testing, maintenance or trouble-shooting for the advanced electronically-controlled main engine and electro-hydraulic fuel system.

Although the STCW Convention 'Manila amendments' of 2010 set minimum standards for the training and competency of users of automation onboard ships, the two-year SURPASS project was initiated in response to concerns that the importance and validity of STCW is weakened by the rapid development of technology.

'An official set of standards of this kind cannot be too detailed and at the same time it cannot be updated immediately after every new technological or technical innovation,' the project team point out. 'And even if it was possible, there would still be a long delay between the introduction of the new technology and the time when trained seafarers enter the labour market with knowledge about this particular matter.'

Although younger seafarers may have grown up with computers, the SURPASS project concluded that both they and older officers need to have better training in the operation and the maintenance of automated systems.

Consequently, the proposed SURPASS training course covers such things as:

- the fundamentals of instrumentation systems used in automated process controls
- use of information and energy control systems
- operation of instruments and automated systems
- management of automated systems

Final course content will be adjusted and improved based on feedback from seafarers and other interest groups during the remainder of the SURPASS project. However, in developing the content a BTEC unit was developed and approved by Edexcel — one of the partners in the project. The BTEC unit relates to general aspects of instrumentation and control, as well as hydraulic and pneumatic systems and their operations.

A novel data-structure has also been developed for the course content, incorporating the principles of automation, as well as operational and maintnance issues. The course includes a set of scenarios based on real accidents.

Another innovative aspect of SURPASS is that it is an online course and contains a series of e-assessment exercises which are used as part of the learning and assessment strategy and can be run on a PC, making it easily accessible by many seafarers and maritime organisations. The course is also designed so that it can incorporate changes to systems, rules and regulations on a continuous basis.

More information about the project and the training materials can be viewed at **www.surpass.pro**.