

SEAFARER TRAINING

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Aviation gives safety lessons for shipping



Techniques used to train airline pilots are increasingly being applied to seafarers. **Andrew Linington** met the brains behind crew management resources...

So there I was, adrenaline pumping, at the controls of a Boeing 737 — plunging earthwards, with the Gatwick landing strip looming large and the flight computer urging me to ‘Pull up, pull up...’

Thankfully for all concerned, it was just a flight simulator. But the experience was real enough, and it formed part of a fascinating insight into the techniques that underpin the concept of crew resource management (CRM) — which is making an increasingly common move from the world of aviation into the shipping industry.

Whilst the speed at which I had started a ship into port — again, thankfully, on a simulator — the experts who have helped translate CRM’s shift from sky to sea believe the two transport modes have much in common.

As ships’ bridges increasingly resemble the flight decks of aircraft, the similarities between the demands on the ‘operators’ converge. And the techniques that have helped to improve aviation safety standards over the past 30 years have become increasingly relevant to shipping.

Behavioural scientist Adam Cowburn helped to develop the first shipping industry bridge resource management (BRM) training package whilst working with the SAS Flight Academy some 20 years ago.

There had been a growing recognition of the importance of human factors in shipping during the 1980s, and the catalyst was the Herald of Free Enterprise disaster, which led to a conference in Scandinavia where it was asked whether we could adapt CRM for the bridge environment, he explains.

Over the following four-year period, SAS worked with a number of organisations — including the Dutch marine pilots and the Swedish and Finnish maritime administrations — to develop the world’s first BRM course, which was launched in 1992.

It was a synthesis of the 15 years of experience from aviation CRM, coupled with the shipping industry’s requirements, says Mr Cowburn. ‘CRM transformed the way airlines functioned, and it was very clear that it had much to offer the maritime sector.’

Aviation CRM addressed human factor issues by tackling such things as the hierarchies, command and control, decision-

making and communications — all big things for shipping. One of the biggest changes CRM made in aviation was the concept that while the captain had absolute legal authority, he did not have the automatic authority to do everything, Mr Cowburn says. ‘Before this, it had been shown that factors such as authority balance, closed-loop communications, and challenge and response had been common elements in accidents.’

Mr Cowburn says ‘human error’ can often be a convenient label to mask more fundamental factors. Humans may often be the best defence against bad or failed systems, he points out, and C/BRM training helps to improve that critical safeguard.

There is a tendency to focus on failure rather than cause, and the industry is not very good at learning from the positive things. One of the biggest things shipping can learn from aviation is a systematic approach to safety, but we need a blame-free environment in order to learn, he adds.

BRM training seeks to create such a culture change, by helping seafarers understand the critical psychological and interpersonal skills they need to work safely. ‘It gives them a toolkit, based on science, which helps them to better deal with issues such as communications,’ Mr Cowburn explains.

Since the original BRM course was launched, more than 20,000 seafarers have been trained in line with its principles. BRM has broadened into engine resource management (ERM)

and further refined into maritime crew resource management (MCRM) — reflecting its emphasis on all onboard, rather than just bridge teams.

Mr Cowburn is now the chief MCRM instructor with the Oxford Aviation Academy (OAA). The company has been operating for almost 50 years and is now the world’s largest independent aviation training provider, having acquired the SAS Flight Academy some three years ago.

OAA provides maritime course licences and tailored courses for many companies, such as Royal Caribbean, Scandlines, Exmar and Alamy. It also counts the Canadian Coast Guard and the Swedish and Singapore Navies amongst its clients, and recently signed a five-year deal to deliver MCRM training for Chevron crews.

OAA’s MCRM courses continue to draw from their roots in aviation methodologies, but are continuously adapted for shipping through analysis of accident case studies and the latest research, together with techniques such as interactive film clips.

‘We have been very conscious in developing the programmes that whilst there are similarities between shipping and aviation, the two industries are not the same and there are significant differences such as the cultural mixes on ships and the dynamics of living and working together for long periods,’ Mr Cowburn explains.

A typical course runs for four days, and covers such issues as human performance and limitations, attitudes, situational and cultural awareness, communication, authority and assertiveness, workloads, humans and automation, error management, leadership styles, decision management, crisis management, crowd management, and critical incident debriefing.

Normally, the MCRM course will involve 10 to 12 participants — who can come from a variety of ranks — and will include an element of computer-based training, briefing sessions, group discussions and case study reviews.

The course aims to foster improved communications between crews and an improved awareness of safe working practices. A core objective is encouraging a sense of shared responsibility — in which challenge and response enables crew members to raise concerns if they believe there is a deviation from ‘standard operating procedure’.

OAA also encourages senior shipping company management to go on the courses, on the basis that MCRM is not just for operators but for organisations. ‘Aviation CRM helped to integrate the flight crew and the ground staff, and there are many cases to show a similar approach is needed in shipping,’ Mr Cowburn points out.

As well as offering bespoke courses for shipping companies, the company also runs a three-day ERM course, crisis and crowd management courses, and MCRM refresher courses.

Mr Cowburn says refresher training is an essential part of securing the desired culture change in shipping. ‘Ideally, this should be every three years — and that is what it is, by law, in aviation,’ he points out.

‘However, the big difference from aviation is that there has been no real move within the shipping industry to make CRM obligatory, whereas in aviation it became mandatory within five years of the launch,’ he adds.

Part of the problem, Mr Cowburn argues, is the comparative lack of standardisation within the shipping industry. In contrast with aviation, there is enormous variation in everything from the national authorities and the flag states to the compa-



MCRM expert Adam Cowburn. Picture: OAA

nies. The underlying sub-text is the lack of rigour in terms of regulations, and this means that many of the issues we are bringing to the table from aviation are about adherence to quality standards.’

Whilst being ‘cautiously optimistic’ about safety trends in shipping, Mr Cowburn says this lack of rigour creates commercial pressures for the companies that are committed to raising standards. And he is also concerned that the trend of criminalisation is undermining efforts to create a more progressive approach to understanding the causes of accidents.

Whilst there is a welcome and growing awareness of the importance of the ‘human factor’ in safety at sea and the recognition of problems such as fatigue, ‘the big question for the shipping industry as a whole is whether it has the staying power to carry through the necessary culture change,’ Mr Cowburn cautions.

In turn, the big question for him is how successful is MCRM in helping to drive those changes? ‘Does it work? Nobody knows,’ he replies. ‘You can’t prove that it works, but you can show that attitudes change and behaviour is improved — we have a database of over 35,000 surveys and 15,000 interviews to demonstrate this. And it is shown in aviation that when attitudes improve, you get a drop in deviation from standard operating procedures, and I think it is right to assume that the case will be the same in shipping.’

‘What we can bring from aviation is a holistic approach to safety, where everyone on the vessel has a shared mental map and the communication onboard creates a clear and common picture of what is going on and where. That’s a challenge, in the sense that any human factor training is ultimately about culture change and asking people to do things differently...’

Union backing for BRM moves

Nautilus is backing moves to make bridge and engine resource management training a mandatory requirement for all ships’ officers.

Proposals for compulsory B/ERM rules within the International Standards of Training Certification & Watchkeeping Convention are due to be decided at a diplomatic conference in June.

Mr Graveson says the Union will seek to ensure the proposals are adopted and followed through with refresher training requirements. ‘If the IMO fails to address this issue, the consequences for the industry will be grave,’ he warns. ‘It would be disappointing if regional solutions were to develop through a failure to secure international consensus.’

‘We have known for a long time that a very significant proportion of accidents are the consequence of human factors,’ says Nautilus senior national secretary Allan Graveson. ‘Increasingly in other safety-critical industries there is a concentration on human behaviour and it is essential that these issues are addressed in a maritime context.’

‘Because of the highly diverse nature of the international shipping industry, there is a particular need to consider how those that work together actually train together, using a common language and common recognised procedures,’ he adds.

‘Shipping companies really need to invest in this type of training so that they can be sure of successfully responding to the technological changes that are taking place within the industry,’ he points out.

Currently, companies are simply recommended under the STCW Code to issue guidance based on BRM principles to masters and officers. But as part of the International Maritime Organisation’s work to revise the 1995 STCW Convention, Singapore tabled proposals to make key elements of resource management training mandatory, arguing that this would enhance the quality of seafarer training and help reduce the number of accidents.

The proposals to make resource management a mandatory training requirement for officers serving at the ‘operational level’ — second officers/third engineers — are to go before the



Airline pilots undergoing simulator training. Picture: OAA

Air disaster rewrote training manuals

In thick fog at Tenerife airport on 27 March 1977, a KLM jumbo jet collided with a Pan Am 747 — resulting in the aviation industry’s worst-ever accident, with a death toll of 583 passengers and crew, and leading to the introduction of what became known as cockpit resource management (CRM).

Investigations into the causes of the Tenerife crash revealed a series of contributory factors that continue to be familiar within the shipping industry — including communication problems and commercial pressures.

It was discovered that the KLM captain had attempted to take off without receiving clearance from air traffic control, possibly as a result of concerns that the aircraft would soon be beyond its flight time limitations as a result of delays.

Accident reports revealed a series of misinterpretations and false assumptions, as well as the use of ambiguous non-standard phrases. The black box recordings showed that the KLM flight engineer’s concerns about the situation had been dismissed by the captain and co-pilot.

The shock waves sent out by the disaster built on concerns about a series of accidents in which ‘human factors’ on the flight deck were seen to be critical and led to radical changes in international aviation regulations — including requirements for

standard phrases and a greater emphasis on English as a common working language. But the most fundamental changes were those that transformed onboard operations, with cockpit procedures and relations between flight deck crew being re-thought and re-worked — not least through the introduction of CRM.

The concept of CRM was created following NASA research into the role of the human element in the vast majority of aviation accidents — some 85% being attributed to flight crew or air traffic control error.

Studies presented to a NASA conference in 1980 highlighted such issues as failures of interpersonal communications, decision-making, and leadership and proposed training to reduce ‘pilot error’ by making better use of the human resources on the flight deck. CRM sought to improve knowledge, skills and attitudes by addressing such factors as communications, situational awareness, and teamwork.

CRM was rapidly adopted by airlines and training (and regular refresher training) became a regulatory requirement for commercial pilots within a few years of the NASA conference. The techniques are also being applied to other aviation industry workers and to staff in other safety-critical jobs such as medicine and the nuclear industry.



One of Oxford Aviation Academy’s sophisticated flight simulators. Picture: OAA