lessons from the aviation industry

Delegates at one Quincentenary Congress symposium heard how aspects of aviation research and practice had potential applications to reduce errors in surgery. Rhona Flin and Simon Paterson-Brown report

Aviation workplaces, such as flight decks and air traffic control centres are very different environments from hospital operating theatres, yet from a psychological perspective, the behaviours required to maintain safety and maximise performance are strikingly similar.

Thirty years ago, the aviation industry realised that many accidents were not primarily due to technical failures or poor flying skills, instead both human error and organisational factors were the prime causes of aircraft loss.

Consequently, resources were directed at gaining good diagnostic data on when and why errors occurred and what could be done to trap them or minimise their effects. Three eminent aviation specialists took part: Dr Judith Orasanu, an aviation psychologist from NASA Ames in California, Michael Woldring, a human factors specialist from Eurocontrol (air traffic management research) in Paris and Captain Sandy Mitchell, a 747 captain and consultant anaesthetist.

Orasanu outlined data-gathering techniques used in aviation psychology, such as cockpit voice recordings, simulator experiments, surveys, interviews and accident analysis. She showed that pilots’ decision errors were a major causal factor in modern aviation accidents, although these were often accompanied by secondary errors when the co-pilot failed to monitor and/or challenge the action.

One particular decision failure was a ‘plan-continuation’ error, when pilots were reluctant to deviate from their plan, even though the situational risk had increased. This became more likely when they were close to completing the flight. She also examined pilots’ perceptions of different types of risk – showing that co-pilots were particularly concerned with professional (career) risk, as well as other threats; possibly explaining their reluctance to challenge captains’ errors.

Woldring presented a detailed analysis of the Uberlingen accident when a cargo jet and a passenger jet carrying Russian children collided in mid-air. He revealed not only the complexity of decisions facing the pilots (who had contradictory advice from the controller and the electronic traffic warning system on the aircraft) but also how the degraded working conditions of the controller on duty created a fatal set of error-enforcing conditions. This raised many organisational questions in relation to air traffic safety management.

Mitchell showed how psychological research and accident analysis data were fed into a range of practical techniques used by the airlines to monitor and manage safety. With very few accidents to analyse, he emphasised the importance of diagnosing latent conditions by collecting incident data through mandatory occurrence, as well as confidential reporting systems, the latter allowing much deeper data capture than anonymous systems.

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