

Making the Health Care System truly “Error Tolerant”

by Capt. Timothy Crowch

1. Introduction

Increasingly over recent years, a growing number of organisations, particularly those operating within complex industries, have been turning toward civil aviation for assistance in establishing modern, effective safety strategies. The reason for this is well known, namely, that since the early 1960s, the world of commercial aviation has invested heavily in safety management and is proud to admit that the results are now testimony to the return on that investment.

However, it was not always this way and we have had our share of “wrong turnings” and failures along the way. The main benefit, though, from these negative experiences is that we have learned from our past mistakes and turned them into positive success stories.

In our world, the 1960s witnessed the introduction of the jet age, which demanded new flying skills from our aircrews. It also brought the beginning of the recording devices that have now become synonymous with flight safety. With the invention of the first Flight Data Recorder (FDR) in 1957 by the Australian, Dr. David Warren, followed a few years later by the Cockpit Voice Recorder (CVR), we now had the means of recording, at least then in a rudimentary fashion, some of the aircraft’s behaviour and a little of that of the crew. Ten years later, a couple of airlines¹ started to analyse sporadically some of this data to ascertain how their aircraft were indeed being operated away from base. With time and with the advent of the digital age, these devices became much more sophisticated and progressed from measuring tens of parameters per minute to over 1500 per second. The analysis of the acquired data also matched the sophistication but we were, on the whole, only measuring technical performance and the crews’ technical skills.

Then on a Sunday afternoon in March 1977, in Tenerife, a nightmare became reality when two Boeing 747s collided on ground in poor visibility caused by cloud rolling in off the Atlantic and shrouding a high altitude airfield. That afternoon, our industry killed 583 people – to this day the industry’s worst disaster. There were a number of contributory causes to this accident but what broke through the final defence barriers was a misunderstanding in communication (between the air traffic controller and the crew as well as within the crew) exacerbated by a very steep authority gradient on the flight deck of the departing aircraft. The Captain believed that he had received his take-off clearance; the First Officer was of another opinion and attempted to intervene. The Captain, rather than clarify the situation, overruled him, applied take-off thrust and seconds later collided with another 747 that was still taxiing along the runway as part of the taxiway was closed for repair.

¹ BOAC and Swissair

The realisation hit the industry that we were doing something very wrong and we had no alternative but to change – we had to change the way we were operating aircraft in the then modern environment; we could not tolerate creating such gruesome spectacles for the travelling public. The industry would not survive. One immediate consequence was that one of the airlines involved, KLM, launched their “KHUFAC”² programme created and led by Dr. Frank Hawkins, then a Human Factors consultant and pilot with the airline. Its emphasis was to be solely on the area of human factors or, otherwise referred to as “non-technical skills” training.

2. *Pro-Active vs. Re-Active Safety Strategies*

This was, in essence, the birth of aviation’s cockpit resource management (CRM) later to be renamed “Crew Resource Management” as it started to encompass crews outside the cockpit. This philosophy has grown to the point that we are now teaching a “6th generation” format of the original but the initial pioneering work performed by Hawkins among others is as valuable to us today as it was revolutionary then. The training targeted soft skills, interpersonal skills, which, in the average pilot had not been honed to the levels of his technical skills. Here was the identified weakness in our operating system.

In parallel with this new Human Factors approach to training, data analysis was used to support this, reporting systems were created and introduced; initially these were anonymous only later to evolve into confidential and even, in some companies, open systems. The emphasis was finally shifting from “reactive” safety management to a more “pro-active” approach.

Modern safety management has, at its heart, the anticipation of danger, the awareness of hazards and their identification. By raising the levels of awareness of all members of an organisation’s staff to *potential* danger, we establish another line of defence in our system. Our culture begins to change to one that protects an organisation from possible events that have *not yet* happened.

Reactive safety management is the most ineffective and expensive form of safety. With this approach we will never prevent the first accident, at best only the second. This philosophy presupposes that we are prepared to accept the first accident in every category.

During the last 5 years in Switzerland, Swiss hospitals have been introducing incident reporting systems at an ever-increasing rate. I find it unfortunate that these systems, which are computer-based and integrated into the hospital’s intranet have been given the acronym C.I.R.S. – Critical Incident Reporting System³. I term it unfortunate as it assumes that we wait for the incident to occur and only then react. ASSM’s training courses emphasise a number of points very strongly:

² KLM Human Factors Awareness Course

³ Originally conceived by Prof. Robert Helmreich in 1995 with Drs. Daniel Scheidegger and Sven Staender at the University of Basel.

- This is a safety reporting system and should be used for reporting hazards or potential hazards as well as incidents.
- It is also a channel for feeding back good news and success stories and not just those with a negative or failure character.
- An incident can be looked upon as a positive event as something in the system prevented it becoming a major catastrophe.

The course participants occasionally have difficulty at first understanding this pro-active approach but, with the help of examples from other industries, we are able to leave a strong and lasting message with them.

For a pro-active system to work effectively, all levels of hospital staff must be availed of the same training, from the most senior surgeons through all levels of the nursing teams to the support and cleaning staff⁴. This is essential as the introduction of a reporting system *and* a safety programme (the first is only a component of the second) necessitates the introduction of a totally new operating culture within the organisation.

Fear and reluctance normally predominate at the introduction of such a programme. It can be wrongly interpreted as just another means by which management wishes to control or even spy on its employees. Quite the opposite is the case; a reporting system is finally a tool for the staff, a tool by which they can effectively improve their working environment. It focuses on the staff and the programme is driven by the staff. This message is seldom brought across to them strongly enough, however. Only when all are fully integrated into the programme will a "unité de doctrine" stand any chance of being established and, only when that successfully is, will the system perform as the creators designed it to and the management expects.

Safety management is another form of change management and we all know how we inherently tend to resist change. It is unfamiliar, we fear it, we are suspicious of it and it upsets our comfort zones. This is why it is imperative that safety awareness and non-technical skills training accompany the introduction of safety programmes. Such programmes demand a wholly new set of attitudes, behaviour patterns, methods and styles of communication. This was the experience of the aviation community and it was not easy. Those who needed the training most at the start were exactly those who resisted it the most, walking out of what were then voluntary training courses. However, the critical mass of the change drivers slowly started to dominate and they realised that, even without openly admitting it, they, too, might have something to benefit from the new culture that was being introduced.

The result in the airline world was a flatter hierarchical structure, more open communication, enhanced team performance and a phenomenal degree of "error tolerance" in the entire system. People create safety, no person or system has an automatic right to it; it has to be earned – every day.

⁴ A client psychiatric clinic recently reported that a cleaner on more than one occasion discovered the stumps of burned candles in a patient's rubbish bin. This was reported by the cleaner via the newly introduced reporting system and represented a severe fire hazard to the building and its occupants. It was subsequently found that the patient had a liking for playing with flame.

3. The Way towards an "Error Tolerant" Health Care System

Much has been written in more modern times on the Health Care industry leaning from aviation; one of the greatest promoters of the comparison being Prof. Robert Helmreich⁵ of the University of Texas. He is extremely highly regarded for his contributions to human factors issues in aviation but, as he puts in his own words, " as I grow older and visit my doctor more often, I have this growing interest to focus on the medical world!"

It is, nevertheless, most important that we take time to recognise the different characteristics of the two complex industries. There are fundamental differences and as our trainers enter the hospital environment, we make it very clear that we are not medical specialists any more than we are marine specialists or nuclear power specialists when we talk with them. However, it serves us well to concentrate on the multitude of similarities that exist between the industries and the common denominator is – the human element.

Aviation is most fortunate in that the vast majority of research carried out into human factors in aviation has been supported by State Government institutions or universities, which have had generous resources at their disposal. The knowledge gained, though, is not the property of the aviation world alone and may be shared and profited from by other complex, human controlled industries.

Whereas CRM or non-technical skills training is now mandatory in the airline business throughout most of the world, it is a long way from being so in the world of health care. This is unfortunate because hospitals with well-functioning reporting systems are gathering enough data to prove that the percentage of their incidents resulting from deficiencies in non-technical skills (NTS) is similar to that traditionally in aviation – 70-80%.

If we take the view that non-technical skills comprise the glue that holds together the professionals' technical skills, then the standard of NTS takes on a new importance. By improving these skills, by raising them to the level of the technical skills, we are taking a quantum leap towards a pro-active safety management culture and building effective error tolerance into the health care system.

Clients have reported figures such as 53% of all critical incidents in 2007 were as a result of errors in communication, 46% were medication errors, 22% lack of effective leadership, 25% breakdown in team performance etc. Nothing here has anything to do with the individual's medical training and yet the training emphasis remains on the technical skills and not focusing on the self-evident weaknesses in the system.

⁵ He has written more than two hundred papers, chapters, and scientific reports. He is the author (with Ashleigh Merritt) of the 1998 book, *Culture at Work in Aviation and Medicine: National, Organizational, and Professional Influences* and co-author of *Group Interaction in High Risk Environments*. Research support has come from the National Science Foundation, the National Institute of Mental Health and the Office of Naval Research. Current research is supported by NASA, the Federal Aviation Administration, the Agency for Healthcare Research and Quality, and the Daimler-Benz Foundation.

At some time we have all heard the phrase "fail safe". Simply defined it means that if a component somewhere fails, the system in question (usually a machine or the person operating it) will not come to grief. It is possible to build the same principle into complex environments that are people intensive. The starting point is to identify what is referred to in accident investigation as a "single point of failure". This implies in the complex environment that if the individual perpetrates an error, either of commission or omission, then the whole system becomes endangered and runs the severe risk of failing – and tragically often does. The health care environment is littered with a multitude of these single points of failure and the industry is fully aware of this. The old culture of blame and punishment has failed to shore up the defences. Imagine the consequences if, every time a pilot made a mistake, the result was an accident. You don't have to look far for the answer – just review our pitiful statistics of the 1950s and early 60s and several recent fatal accidents in Asia.

The more complex the working environment becomes, the greater the demand for team performance. The complex world no longer tolerates "stars" as they have no place. We have all, as fallible humans, become dependent upon one another. No-one can any longer function as an island, a law unto him/herself. This intensifies the demand for perfecting skills in communication, intervention, leadership, followership, judgement, decision-making feedback and more. Only by consciously developing new processes and procedures can we effectively reverse the trends in incidents and accidents. Attitudes towards different communication styles, to monitoring the work of colleagues and to intervening in times of uncertainty must change. However, they can only change and bear fruit in a new, open culture where all involved are genuinely encouraged to anticipate an event and not await its arrival. It is commendable to investigate all incidents and accidents thoroughly. It is then critical, not only that the findings are published and circulated to all parties but also that any recommendations are acted upon and all possible lessons learned. This is the part of the safety process in the aviation world where our reputation stalls and risks becoming unravelled.

This is a tragic admission but true. Why? The industry is struggling to survive in its present form and much-needed resources are being diverted elsewhere.

4. To a Safer Future

The external market pressures are enormous with the demands being placed upon the world of health care in all countries, even within the most affluent nations. In private and in public health care the pressure on financial results is all-dominant. However, it is worth considering the short- and long-term perspective. Are all economies and cost-cutting measures truly effective even if the costs of failure are deducted from another account? Has everyone given serious thought to the *uninsured* costs entailed in a hospital incident?

The cost of accidents is increasing. The focus of the media is turning away from the traditionally sensational aviation accident (there are not enough) to another area that affects every person sooner or later and carries with it equal

quantities of emotion as an air disaster – our safety in a hospital. Where the media leads, litigation is not far behind. Criminalising accidents is a subject all by itself but it is anathema to a healthy safety culture. However, ignoring NTS training may, one day, risk being classified as a breach of duty of care.

Pro-active thinking and the heightened need for “error tolerance” in every aspect of the mindset of the health care industry are the keys to protecting its resources and its future image. The perception of the public is predominantly subjective and highly emotional, facts and statistics are seldom given the attention they deserve.

Tenerife forced change upon aviation – we had absolutely no alternative. Change is painful but essential – the professional image of our two industries hangs upon it. We ignore it at our peril but let it not be forgotten, it is easier to change in our own time than to delay and have change imposed through legislation upon us.