

In search of **resilience**



Making safety management an integral part of airline culture will help companies face new challenges to flight safety.



Professor James Reason

HOW DID IT HAPPEN? How did the defences, the barriers, the safeguards, the many layers of protection – how did they all fail?

From a safety management perspective, what led to the 11 September catastrophe were two basic assumptions. Two assumptions lurking as latent conditions for system failure. Conditions that had existed within the system for many years.

These assumptions arose because the designers, the specialists, the managers, the procedure writers, could not foresee all the scenarios of failure.

One assumption was the fact that no-one appears to have anticipated that a large number of individuals would be willing to die in such an attack.

That unconscious assumption actually changes the whole nature of the business of building defences to preserve safe operations.

The second flawed assumption, which had been set in many minds for many years, was that a certain type of office implement, available in all stationery shops and normally used for opening parcels, did not represent a safety risk.

That subconscious assumption was made because many people routinely carry and use box cutters or Stanley knives, and no hijacker had ever used one as a lethal weapon.

We've known about terrorism as a threat for 30 years or so, and we have taken steps to put numerous defences in place.

So how is it that those numerous defences failed simultaneously, with at least four groups of people?

These are the kind of questions that help us focus on the issue of safety management systems. The first issue is to identify the risks, and the next is to attempt to control them. A system that does not identify all the risks will not provide the means to control them.

Safety basics: Most of us are familiar with quality assurance, or quality management systems. A pressing question for people running businesses is: "To what extent does quality management relate to safety management?"

It's reasonable to say that in regard to the principles and the basic underlying philosophy, quality and safety management systems have about 70 per cent in common. They both have to be planned and managed, because neither quality nor safety happens by accident. They both depend crucially upon measurement and monitoring, and both involve every aspect, every function, every process, every person; and both strive for continuous improvement. Neither are looking for massive, dramatic changes in either safety or quality, but they are both about continually massaging established systems towards a safer or higher quality condition and outcome.



However there are important differences which need to be understood.

Quality management was developed by business gurus in the 1960s, a time when we had little contemporary understanding of the human factor, and/or the organisational factor.

At that time, quality assurance practitioners would refer to the human factor as an issue of “carelessness”, or some other not particularly useful term (such as “pilot error”).

So one of the ways safety management differs from quality management is that it has to focus on human and organisational factors because they dominate the risks in all kinds of ways.

There is another question which asks, “Can we apply quality assurance to the business of safety management? Will quality assurance assure safety?”

The answer is an emphatic “no”.

One can apply quality assurance to the documentation and paper trail of safety management systems: but that in itself does not assure safety.

Quality assurance is clearly about assuring customers and other people that your system can deliver what it claims to deliver: the products and the services to the required quality. It does this by documenting the way in which things are supposed to be done, and then

audit to check whether the actuality is matching what is intended or what is desired. Where there are discrepancies, these are fed back into the organisation so that they can take some corrective action and, as a consequence, the business can continuously improve its performance.

Although that is the theory, I think we now

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know that quality assurance is such a labour-intensive business that it has become a question very much of form rather than substance; of ticking the boxes and a lot of very hard work.

To put together an audit team, for example,

takes an enormous amount of time and effort. The audit team must be briefed and checklists and audit procedures must be developed. Just going through the motions of the business of quality assurance often blinds people to the fact that what they are assuring is not actually the reality. This is very clearly the case in several “quality-assured accidents”.

The establishment and operation of safety systems must have, as one of its goals, the avoidance of bogging down in unnecessary paperwork of that kind. I compare managing safety to fighting a guerrilla war in which there are no final victories. It is a never ending struggle to identify, and eliminate or control hazards. It must therefore be ongoing, adaptable to new information and situations, and be dynamic.

Setting safety priorities: We will never run out of things to do to make a system safer. Sound management requires that we identify potential improvements, decide how to achieve them, and hold ourselves accountable for achieving them.

Risk management procedures can help managers decide where the greatest risks are, and help set priorities. Sound safety goal-setting concentrates on identifying systemic weaknesses and accident precursors, and either eliminating or mitigating them.

It is impossible to detail a safety system that would suit every aviation operation, because

their operational profiles are so diverse. What is possible, is to set out most of the foundation stones and goals of any successful system within the aviation industry.

The error problem: When aviation safety and its practices began to undergo scrutiny beyond the allocation of individual blame for events, we took a significant turn towards improved safety outcomes.

As aircraft reliability and maintenance improved with the advent of jet aircraft, it was first observed that human error was at the heart of a growing percentage of accidents and incidents. Human factors studies and solutions quickly homed in on issues such as cockpit and maintenance resource management.

Very soon afterwards, it became recognised that human error was occurring because adequate systems were not in place to identify potential causes so that similar events would not happen again. The focus thus turned towards human and organisational factors, because there's no way to manage safety in a complex system without regard to those two factors.

Error problem: There are two ways of looking at the error problem. First is the person model which is the dominant model. It's the one that almost everybody, in some way, still subscribes to, even though they might say otherwise. It is the view that in an accident, the initiating causes occur between the ears of some individual at the sharp end. However, it is also the case that the accident would not have occurred without some existing condition within the organisation.

The purpose of an organisational safety system is therefore, to identify the condition that allows that individual to be exposed to a hazard, and to remove the condition, thereby removing the hazard.

In the 1990s, the term "organisational accident" was coined, because most of the links in an accident chain are under the control of the organisation. Since the greatest threats to aviation safety originate in organisational issues, making the system even safer requires action by the organisation.

Building a successful system: A successful safety management system is a systematic, explicit and comprehensive process for managing safety risks. As with all manage-

ment systems, it involves goal-setting, planning, documentation, and the measuring of performance against the goals. Any successful safety management system is woven into the fabric of an organisation. It becomes part of that organisation's culture, and of the way people go about their work.

Responsibilities: Safety management starts with a management philosophy that recognises there will always be threats to safety. It sets the organisation's standards and confirms that safety is everyone's responsibility.

Safety management specifies how safety will be achieved, with clear statements of responsibility, authority, and accountability. It begins with the development of organisational processes and structures that incorporate safety goals into every aspect of the operation. Having laid those foundations, it develops within the organisation, the skills and knowledge neces-

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sary to do the job, and begins to put the whole system into practice by:

- Setting procedures to execute the policy with a direction to all staff.
- Providing the means for planning, organising, and controlling.
- Establishing a system to monitor and assess safety status and processes.

Avoiding shortcuts: When the system is in place, employees throughout the organisation will be following well-designed, effective procedures, avoiding shortcuts that can be a hazard to safety, and taking appropriate action when a safety concern is identified.

Throughout these processes, the organisation is building within itself what is now called a "safety culture". The prime features of the safety culture are that participants are

well-informed, that they understand the hazards and risks involved in their own activity, and that they work continuously to identify and overcome hazards.

There must also be what is known as a "just culture" in which human errors must be understood, but wilful violations cannot be tolerated and in which the workforce knows and agrees on what is acceptable and unacceptable.

Effective safety: The hallmarks of an effective safety system are:

- People feel encouraged to voice safety concerns and to report events resulting from human error without fear of retribution.
- When such concerns are reported they are analysed and appropriate action is taken.
- People are encouraged to develop and apply their own skills and knowledge to enhance organisational safety.
- There is never the complacent view that the safety system has achieved its goals and needs no further modification.
- Staff are regularly updated by management on safety issues.
- Management acknowledges all safety concerns and suggestions, and safety reports are fed back to staff so that everyone learns the lessons.
- Management practices what it preaches regarding safety, including the allocation of sufficient resources and the prioritisation of safety ahead of cost.
- Management gives timely, relevant and clear feedback on decisions, even if the decision is to do nothing.
- If no action is contemplated, that decision is explained.

When you can say "yes" to all those hallmarks, you have in place an effective safety system.

Professor James Reason is a specialist in safety management systems. His "Reason Model" of accident causation has been translated into successful operational safety programs by companies including Shell, British Airways, and Singapore Airlines.

Along with Professor Patrick Hudson and Bruce Byron (following pages) he presented a series of nationwide Safety Management Breakfast Briefings from 10-18 September 2001.