

Close Calls: The invisible work of risk management

Carl Macrae considers the importance of learning lessons from aviation safety

Aviation is a remarkable industry, but its achievements have largely become invisible. Air travel is often merely an interruption – and something of an uncomfortable one – in our busy schedules. It has become entirely unremarkable to span half the globe in a single sitting: to eat dinner, catch a movie, enjoy a few glasses of wine and perhaps a short nap whilst being propelled at 900 km an hour, suspended 10 km above the Earth. As it happens, I am writing this article in the departure terminal of a large airport, waiting to do just that. Few of the people around me seem awestruck by the marvels of the jet age, at least outwardly or appear to be waiting in terror, or even mild trepidation, despite our impending launch into the sky.

One of the most remarkable things about modern commercial aviation is the way it has tamed the considerable risks of transporting huge numbers of people at high velocity across the inhospitable reaches of the lower stratosphere. The safety record of modern air travel is striking. Accidents involving large commercial jet planes remain extremely rare, with only sixteen fatal accidents in over 65 million hours of flight in 2013.

The recent loss of a Boeing 777 in March 2014, likely somewhere in the Indian Ocean, and the apparent downing of another over Ukraine in July 2014 are deeply tragic events. One of the most compelling and horrifying aspects of these events is not simply that they happened, but that they both, for radically different reasons, have eluded proper investigation and explanation. One of the most basic premises of risk management in aviation is that disasters will be systematically investigated and must ultimately act as a source of future improvement and reform.

Learning from failure, and reports thereof

Since the first faltering experiments

in powered, controlled flight, aviation has largely advanced through failure. It is telling that the first fatal air accident in the UK resulted in the untimely death in 1910 of one Mr Charles Rolls, of the recently formed automotive and aero-engine manufacturer Rolls-Royce. He was piloting a Wright Flyer. Two years later saw the UK's first formal air accident investigation, foreshadowing a century of increasingly sophisticated efforts to investigate failure to improve flight safety.

The airline industry remains deeply preoccupied with risk and reliability, and one of the groups that is the most preoccupied is the small professional community of flight safety investigators. The term flight safety investigator brings to mind images of the teams that crawl over accident sites and pick through twisted wreckage. But in truth, few flight safety investigators do this sort of work. Most work in airlines and are responsible for the oversight and monitoring of flight safety across an airline's operations.

And one of the main responsibilities is to review, assess and investigate reports of minor safety incidents, near misses and operational failures of various kinds. Modern airlines operate well established safety reporting programmes that gather brief reports from front line staff of any events that might impact flight safety. These events can often seem indistinguishable from the mishaps and complications that characterize ordinary organizational life. They include everything from pilots' confusion over radio call signs, data incorrectly entered into flight computers, lost or misplaced tools in the hangar, mis-set circuit breakers, to damage to aircraft while on the ground.

A typical medium- to large-sized airline might see tens of thousands of such reports from flight crew, engineers, cabin crew and ground staff each year. All airlines operate a suite of safety monitoring and risk man-

agement programmes. But analysing and learning from minor incidents and failures such as these still sits at the heart of airline risk management, and offers an important mechanism for both uncovering and addressing emerging risks.

The sharp end of safety

The work of flight safety investigators is full of paradoxes. Their primary aim is to manage the risks of catastrophic accidents: events that they very rarely see and work continually to avoid. And the primary resources to manage these risks are brief moments when bad things don't happen: incidents, anomalies, close calls and errors where it might be clear that something did not go quite right, but it is far from clear whether something is seriously wrong.

Flight safety investigators work to transform moments of risk into sources of resilience. This is deceptively complex and challenging work. It presents a set of deep interpretive challenges and places investigators at the sharp end of risk management. Investigators, like many other types of risk managers, are faced with a mass of data and events on possible modes of failure. They are presented with a proliferation of weak signals and potential warnings, some of which may hint at catastrophic risks that are lurking in the operational background, just off stage and out of sight – but many which will not.

The work of analysing, assessing and investigating flight safety incidents is therefore as much about making close calls as it is about analysing them. Investigators must continually make fine-grained and consequential judgements regarding what to pay attention to or ignore, what matters and what – for now, at least – does not. These are high stakes and consequential judgements at the very earliest stages of risk management. Mistakes made here can leave risks hidden and unnoticed,

lying latent deep within the organization, and ready to bite in surprising ways.

The invisible work of risk management

It is the complex, consequential and nuanced world of flight safety investigators that I explore in my new book, *Close Calls*. Through detailed ethnographic research I explored and documented the often invisible work practices of risk management that play out around near miss and close call events, and the specific challenges and strategies of flight safety oversight. And, like flight safety investigation itself, this revealed a number of surprises.

One surprise concerned investigators' working model and practical theory of risk. The formal tools they use would be recognizable to many who work in risk regulation, focusing on estimates of severity, frequency and the future likelihood of adverse outcomes. But in practice, flight safety investigators are deeply sceptical of the relevance and utility of these tools in their daily work. Instead, their assessments of risk rely on fine-grained and sophisticated assessments of organizational capacities for control, understanding and cognizance in different areas of operations.

Another surprise is the status of and relationship with uncertainty. Risk management is commonly viewed as the cataloguing, processing and control of uncertainties. But at this very early stage and sharp end of risk identification, flight safety investigators are involved in the active production of uncertainty. They work at the very edge of formal knowledge to uncover new and previously unrecognized risks, so one of their principal strategies of risk identification is to actively construct and ruthlessly enlarge any apparent gaps in current knowledge. At the earliest stages, risk identification involves the active production of



uncertainty and doubt, and these are used as a proxy for potentially latent or newly emerging risks.

And then there is the surprise of what investigators do with these indications of ignorance: they spread them around. This is not just because they are professional pessimists, and pleased to see others equally troubled by signs of emerging threats. It is because safety investigation and improvement is a widely distributed social process. Investigators spread around ignorance in the form of questions, concern and connections as a means of initiating widespread activities of reflection and inquiry into the safety of operational practices. By creating and spreading doubts, investigators activate and guide the search for safety, creating and coordinating networks of engaged participants around their organization that span silos boundaries and hierarchies, connecting the operational front line to the executive suite and back.

So, when you next catch a flight – even if it is delayed, as mine currently is – spare a few thoughts for the small community of safety professionals doing this invisible work. Their day job is to continually worry about the small failures that disrupt organizational life, and to generatively use those events to test the practical assumptions, challenge the operational processes and explore the periphery of organizational knowledge around flight safety. Arriving safely at your destination is, after all, the result of a long sequence of non-events.

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His book, *Close Calls: managing risk and resilience in airline flight safety* is published by Palgrave Macmillan (2014).