Safety versus cost
the rush hour years of aviation

by Heli Koivu

There is a term in the Finnish language that translates directly as 'rush hour years'. It is used to describe a life situation where all major events seem to be occurring at once: starting a family, building a house or moving to a larger flat, finding a position in working life. In aviation today, a lot of things seem to be happening at the same time; should we perhaps describe these as the 'rush hour years' of aviation?

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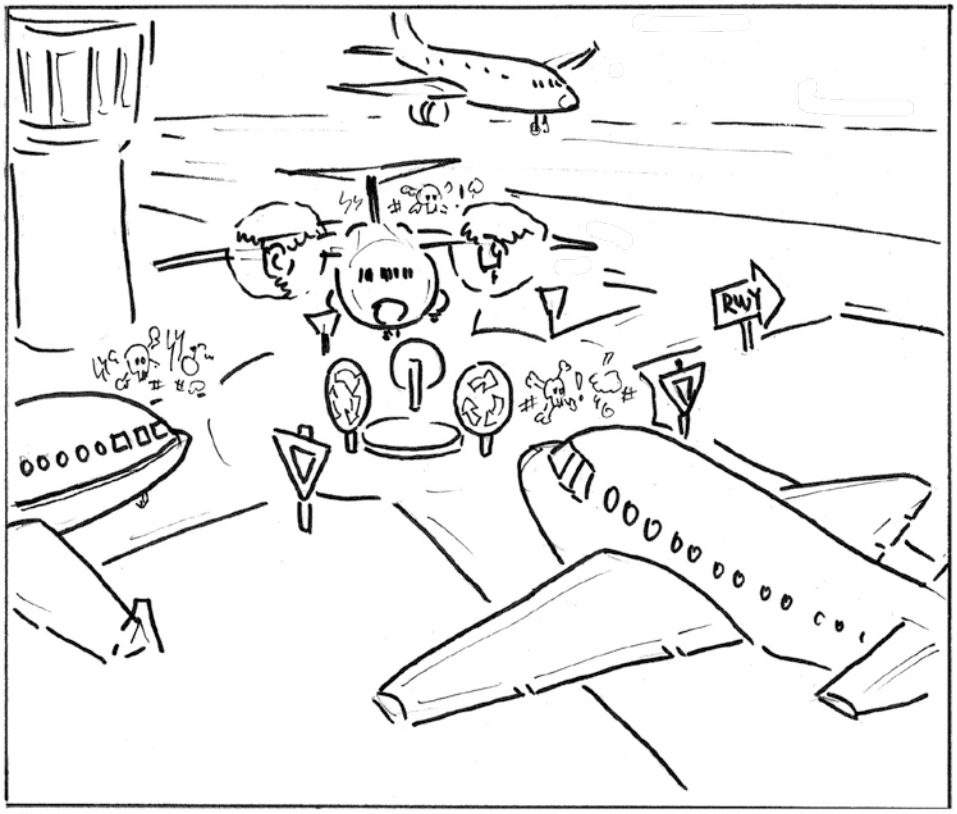
The regulated market and the detailed regulations defining the operating environment are in a state of flux, as opposed to the rather stagnant status quo of previous decades. Our term status quo comes from the Latin phrase status quo ante meaning 'the situation before' which in those days was often before a war as in status quo ante bellum. This seems quite appropriate: aviation is indeed waging a war, battling with severe competition and engaging in price struggles. On the other hand, statistically speaking, air travel has never been so safe. The number of accidents relative to passenger numbers is at an historical low. So why are we – the authorities, businesses and professionals – so worried?

Because of the "war" – the unhealthy competition. Healthy competition in business often improves safety, as it forces enterprises to do things better. Healthy competition likewise promotes balanced use of the various components of production such as human resourc-

es, equipment, systems and processes. But how can we know when competition turns unhealthy? One general indicator of unhealthy competition is that a large number of businesses in a given sector are not making a profit, and operating at a loss is the rule rather than the exception. Although some of the current heavy losses experienced by airlines may be due to historically accumulated corporate structures that are unduly heavy and are now being dismantled, this does not explain everything. Does the price of an airline ticket these days bear any relevance to the actual operating costs involved? Is there revenue under the bottom line for all actors in the production chain?



I'm beginning to think that out-sourcing ground movement wasn't such a good idea after all!

Aviation authorities face a challenge

National aviation authorities face a challenge: the ongoing reorganisation of the aviation sector has led to the disintegration of the traditional operating model for airlines and its gradual replacement with outsourcing, global sub-contracting chains and increased use of hired employees. Despite the harsh competition and the unfavourable economic climate, there are still plenty of enthusiastic and hopeful entrepreneurs in the airline business. How can the authorities respond to this challenge in terms of ensuring the safety of air travel? How can the sprawling network of actors, including those abroad whose actions affect the domestic situation be effectively supervised? How can authorities gain useful information and allocate resources to address identified safety threats within the constraint of existing resources? In short, how to do more with less?

Aviation authorities have an aviator's heart: although everyone knows that safety can only be absolutely guaranteed by grounding every single aircraft, no one wants to do that – quite the reverse. Amidst cut-throat competition, we need an impartial body to watch over the acceptable balance of values. The values of commercial air traffic include safety, efficiency, economy, reducing environmental impact, reliability and punctuality. We must have the capacity to identify situations where safety clashes with other values and address those situations. Yet legislation and the capacity of the authorities to take action do not deliver a complete solution. So what should we do?

How can we ensure safety?

At the heart of this discussion is what is commonly called a 'safety culture'. Is this a real thing or just an empty phrase? Having a 'safety culture' can be defined as being willing and able to undertake continuous improvement of the safety of operations. In any organisation, safety must be kept in mind at every level of decision-making. This means taking personal responsibility seriously and especially applies to senior management, who must be willing and able to understand the impact of financial decisions on safety. They must be able to anticipate and manage change. Tools relevant to this include information-based safety management systems (SMS). Both the authorities and enterprises must adopt a risk-based, data-driven method. In the future, occurrence reporting will be more important than ever before. An enterprise that does not want to implement effective reporting culture and practices and instead maintains a punitive atmosphere is turning a blind eye to correctable shortcomings in the safety of its operations and clearly does not really want to know how its resources are actually being used.

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It is of the utmost importance to establish a European consensus about what a risk-based approach means. The European Aviation Safety Agency (EASA) and national aviation authorities have already done a great deal of work on it. The aim is to find common ground not only on the principle but also on the practical ways for implementing a risk-based approach. This involves understanding how an SMS works and how it can be deployed so as to guide the approach to work of every single employee.

What about regulation, then? Is issuing prescriptive official directives somehow old-fashioned now that we have embraced the big picture? The globalisation of regulation is a feature of stiffening global competition, and in aviation a good start has been made. The promulgated regulations in force are generally consistent regardless of where in the world an airline operates or where a licence or rating has been issued. Close international cooperation between authorities in monitoring and regulation development will help ensure that both regulations and practical operations will respond to changes in the sector. Safety standards must be flexible enough to sustain any threats and changes in the operational environment. Organisations themselves must also take their share of the responsibility for delivering safe operations.

Tacit signals – conflict between safety and cost?

We, the authorities, are increasingly receiving tacit signals indicating that there is an ongoing conflict between safety and financial values. What are these signals? They may be links between hazards and occurrences – although it is sometimes difficult to know whether these are isolated cases or part of a growing trend because of variations in reporting. Tacit signals may also be found in reports from the inspectors monitoring aviation activity, and in informed debate in domestic and international media. All these signals help form a picture of current and potential threats in the industry. Traditionally, authorities must base their actions on facts, but authorities also have an important role in prompting public debate. This is why we have begun to analyse the situation in commercial air transport and present our findings. The impact on commercial air transport safety of changes in the operating environment is discussed in a thematic analysis by Mette Vuola, Aviation Safety Review Finland 2011[1], for instance in the column by Director General Compliance, Pekka Henttu and in the commercial air transport section.

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Who is seeing the big picture?

Times are gone when everyone in the aviation business worked for one organisation – the State. Aircraft operators were first to become private enterprises but more followed and more are to come. The airports are now full of many players from different enterprises with sometimes constantly changing workforce. Luggage handlers and fuel suppliers are pressed by their performance targets and are competing for easy and fast access to the aircraft on the stand during shorter and shorter turnarounds. There are slots for airports and there are ATC slots. Who is keeping the big picture? Aviation safety depends on all the aviation actors but how it is ensured in this constant rush and fragmented picture?

Examples of potential conflicts

Commercial air transport has traditionally been a show manned by well-motivated professionals. Will this continue to be the case? The competence of a given employee may be illustrated with the equation C = A (T+E), where C is competence, A is attitude, T is training and E is experience.

In today's cost-cutting world, training is more and more approaching the minimum levels specified by the authorities, which means that the adequacy of these minimum levels is being put to the test. Organisations and authorities should ensure that the minimum requirements are adequate enough to provide a safe operation. The volume of training is not an end in itself; high-quality training content is a tool for threat management. Quality and uniformity of training are of particular importance in bringing hired or contracted employees with potentially diverse training acquired in diverse operating cultures up to the standard required and for keeping the competence of a company's own employees up to date. For example pilots joining a new airline come with the baggage

1- See http://www.trafi.fi/filebank/a/1349727312/07ee62b11df4654567a22c5a58404a7b/10389-Trafi_Publications_25-2012_-_Aviation_Safety_Finland_2011.pdf

Source: Trafi, Photographer: Mika Huisman, Decopic

of ingrained operating procedures, and they must be trained for the procedures of their new employer and for effective cooperation in the cockpit. An estimated 70% to 80% of the hazards and deviations in aviation are principally due to human actions. A large number of these incidents would have been avoidable through good cooperation in the cockpit and crew resource management (CRM). Similar situation is when an air traffic controller or for example ground handling person is joining a new organisation. ATCOs must also be aware of this risk existing in commercial air transport organisations today. Employee attitude has components such as commitment, pride in one's work and participation in their employer's safety culture, all of which can be influenced, both positively and negatively. Although labour costs may account for more than a third of overall expenditure in a typical airline, the management must be aware of the impact of cost optimisation decisions on employee attitudes and above all ensure that the competence of the company's employees is maintained at a sufficient level under all circumstances. Amidst all the streamlining and cost-cutting, fatigue management is also important. It is essential to ensure that both short-term and cumulative fatigue among employees does not spiral out of control, exposing them to human error simply because they are tired.

Everything is in a hurry these days. Everything has to be done faster, and human beings have turned into homo concitatius – the busy human. Airports and their traffic volumes are growing. These flight factories with their network of criss-crossing runways and taxiways send up aircraft at minimum separations; the myriad of sub-contractors in ground operations form the machinery that is supposed to manage rapid turnaround of aircraft and supply air traffic control with a steady stream of flights to manage. Is this machinery running as well as it should be?

Air traffic controllers play a crucial role in managing the busy flow of traffic and in supervising the big picture. Pilots and air traffic controllers are routinely required to operate with a high workload, sometimes continuously, sometimes suddenly. Maintaining situational awareness in a busy situation is the key element in ensuring safety - analysis of incidents reveals that losing sight of the big picture has been a contributing factor in many hazardous occurrences. In a two pilot flight deck, situational awareness requires that at least one of the pilots in the cockpit concentrates on monitoring the environment, even if the other one has something else to do. It is also important to ensure that any important changes which occur whilst taxiing (changes in the takeoff runway or intersection, weight and balance calculations, or takeoff clearance) are dealt with correctly, monitored and cross-checked. Whatever the stress or time pressure may be, taxiing and takeoff are situations that must always be given enough time and space so that every item on the checklists can be gone through without the pilots having to compromise their situational awareness. This emphasises the importance of pacing and of good cooperation in the flight deck. Air traffic controllers have substantial potential for reducing pilot stress and there are also many opportunities for the pilot to reduce controllers' stress; the potential for human error can be considerably reduced if taxi and takeoff clearances are always given using standard phraseology and not until the aircraft is ready and in the right place, and if communication at critical points during the taxiing (runway crossings and line up) is kept to a minimum.

Aircraft turnround is a highly challenging function. Adhering to tight timetables imposes pressure on both airline and service provider employees. Unfortunate as it is, there are cases on record where corners are cut in agreed procedures at the expense of safety. Turnround times must be realistic. The minimum time in which turnaround can be performed under normal conditions must be respected. It should also be remembered that everything does not always go according to plan.

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Passengers off and on, catering, cleaning, refuelling, walk around inspections and any troubleshooting required and the takeoff slot assigned to the aircraft all have potential for taking longer than expected and nothing must be allowed to create pressures to take shortcuts that compromise safety. A constant sense of rush may increase the chance of human error. This threat must be acknowledged, and safety nets and procedures counteracting this tendency must be put in place. A workplace atmosphere must be created in which every employee is encouraged to take responsibility for the safety of their own actions, to keep an eye out for the safety of overall operations and to report any safety shortcomings observed. Employees should never be afraid to 'blow the whistle' when safety is being compromised or if they suspect this. A chain is only as strong as its weakest link. If a link in the chain fails, only a tight enough safety net can prevent incident to escalate into anything more serious. Take as an example the assessment of aircraft de-icing and anti-icing requirements. Crews unfamiliar with winter operations may have a difficult time assessing whether and how their aircraft requires de-icing or anti-icing. Under these circumstances, safety can be ensured by the airline having a robust safety culture in place, encouraging employees to elect the side of caution in unsure situations. The expertise of ground handling services and air traffic control, and intervention by them if necessary, are also important.

Source: Trafi, Photographer: Mikael Häggblom

There has been considerable debate among experts and in the media about aircraft fuel loads having less contingency than was typical in the past. Seeking to achieve savings by avoiding the carrying of excess fuel is perfectly reasonable as long as the regulatory procedures are applied in a way that respects the need for the aircraft commander to use their reasoned discretion to take account of weather conditions or anticipated delays en route. In any case, the prevention of needless tankering of fuel, the provision of predictable approach procedures and the optimisation of air space use all contribute to a more environmentally friendly aviation sector. Weather conditions, unexpected congestion and holdings or other factors that pilots learn to account for with experience may have a crucial impact on what is the 'right' amount of fuel in the situation at hand. The key issue is how the airline responds to extra refuelling and how transparent the debate on this matter is.

In addition to costs, increasing environmental demands, especially concerning noise, are a continuing issue for the aviation industry. Restrictions are often imposed on runway use or aircraft routing because of noise. However, air traffic controllers and their employers need to keep in mind that ultimately the designation of runway must be predicated on safety considerations. Air traffic controllers also need to be aware of the performance of aircraft – speed and climb rate, for instance – in order to be able to assist a smooth and safe flow of traffic whatever the weather. Finally, back to the question about safety versus cost. The only correct solution is when safety, cost and environmental issues are in an acceptable balance.

You as Air Traffic Controllers have the privilege often to see more of the big picture of aviation operations than the other players, you see the other traffic, the other actors at the airport, you are informed of the severe weather development and of airspace restrictions imposed by military and other airspace users. Keep in mind that, today when the cost is pressing all of us and the "picture" is very fragmented, If you are in doubt about anything with potential safety hazard – there is no doubt that you should inform the others!