

TRADE-OFFS AND TABOOS

Trade-offs are at the heart of why things go right and wrong. So why are they taboo? We need to talk about trade-offs, says **Jean Pariès**.

KEY POINTS

- **Safety is rarely the number one priority. It is the result of trade-offs and compromises.**
- **There are different kinds of trade-offs that need to be understood.**
- **Trade-offs, and their implications, must be recognised, mapped, tracked and monitored before and during decision-making.**

In safety critical activities such as aviation, nuclear, rail, or the chemical industry, the communication from senior executives frequently includes expressions such as “*safety is our top priority*” or “*we never compromise on safety*”. These are nice slogans, and they may suggest commitment to some. But they do not correspond to reality.

The reality, in fact, is exactly the opposite: safety is always the result of trade-offs. If safety were the absolute priority, we would simply not accept risk, and we would stop aeroplanes, trains, nuclear power plants, and some surgical operations. Safety is therefore a compromise between the social utility of the activity in question, and the risk it generates, which cannot generally be reduced to zero. But this trade-off is usually taboo, like a trade-off between saving patients from cancer or making profits from cosmetic surgery. We tend to be repulsed by balancing something

sacred and something secular. Nevertheless, these kinds of trade-offs happen every day. So the question is: should we reject them, or manage them?

If safety were the absolute priority, we would simply not accept risk, and we would stop aeroplanes, trains, nuclear power plants, and some surgical operations.

If we examine things more closely, this global compromise mentioned above breaks down into several kinds of trade-offs.

Most often mentioned is the trade-off between safety and productivity. It has become fashionable to assert that there is no competition between productivity and safety, because the features that

make an organisation effective, such as rationality of processes, clarity of roles and procedures, honesty, transparency, trust, commitment, empowerment, justice, and so on, also make it safer.

While that may be true, it does not mean that there is not, at the same time, a certain amount of friction. When we ‘run’ faster, we are generally more productive and less safe.

The same goes for the trade-off between safety versus comfort at work. Numerous and well-trained teams, the absence of stress, and a nice work environment, are obviously conditions for both comfort at work and safety. But rigorously following the procedures, remaining alert constantly, stopping to think, checking and rechecking, is stressful in real-world conditions. Grouping or ungrouping control sectors affects the free time of ATC staff, but also safety. Grouping

consecutive days and nights of work to then enjoy several days of rest, or simply enjoy the evening before work, may be favourable to personal life and family, but not to safety.

Then there are the trade-offs between different types of risk. Remember the old argument against wearing a seatbelt: "yes, but in case of a fire I will be a prisoner". Without even realising it, we constantly manage these kinds of compromises. Cognitive compromises between thoroughness and speed of execution, between the details and the big picture, between indecision and impulsiveness, between instability of

Trade-offs must be recognised, made as explicit as possible, and treated as such to keep the system safe enough.

decision and mental rigidity. Tactical compromises between the risk of not strictly respecting the required separation between two aircraft and that of triggering a go-around at peak hour. Between continuing one's activity when one does not feel quite right, and overloading colleagues by leaving one's post. Handling traffic involves tactical compromises.

And then there are strategic trade-offs, some of which are played out across the entire system. Trade-offs must be made between short-term and long-term goals. And between conservatism and innovation: in general, innovating increases risks in the short-term, but decreases them, sometimes considerably, in the long-term. The history of aviation is a good illustration of this, with a momentary rise in the frequency of accidents found during the introduction period of almost every new generation of aircraft. We must find the right setting between the audacity necessary for the future and the prudence necessary for the present.

But the trade-off that I probably find the most important – because it drives the fundamental safety

strategy – and at the same time the most difficult to grasp, is the one that concerns optimisation and resilience, or adaptation and adaptability. Take the metaphorical example of the polar bear. This splendid animal is incredibly well adapted to an extreme environment. But the current rate of global warming is already threatening the existence of this species. Lesson: if you are very well adapted to your environment – 'optimised', economists would say – you are very efficient, but very fragile regarding changes in your environment. Robustness against the unexpected implies 'under-optimisation' – generalists, not specialists, adapt better to change. Hence the fashionable 'optimisation' processes may make operations better (more efficient, more reliable), possibly cheaper, and even safer within their adaptation envelope. Unfortunately, they also make them less 'resilient' outside of their adaptation envelope. And this can be significantly worse for safety.

Well, you will say, safety is the result of different compromises, so what?

The worst thing would be to deny the inevitable nature of trade-offs, even in the name of noble intentions. Trade-offs must be recognised, made as explicit as possible, and treated as such to keep the system safe enough. Whenever a decision is made in the organisation, the underlying decision-making must be clearly explained, without taboos. Decision protocols must be defined – and followed – to protect bottom lines in terms of safety. We must not say, after the decision has been made: "Here we are, now let's address the safety issues." Instead, we must address safety before and during making decisions, asking "What trade-offs are we actually making? What are we sacrificing? How do we compensate for it? What ensures that unacceptable safety lines are not crossed?" Furthermore, agreed trade-offs should be mapped, tracked and monitored, to avoid the accumulation of small setbacks that ultimately lead to the unacceptable. Trade-offs are the very essence of life. Do not make them taboos. Let's manage them instead. **S**



Jean Pariès graduated from the French National School of Civil Aviation as an engineer. Since then, he has worked at DGAC France in air safety regulation, and Bureau Enquêtes Accident. As Head of Investigations, he led the technical investigation into the Mont Saint-Odile Accident, 1992. Currently Jean is CEO of Dédale SA. He has held a Commercial Pilot Licence with instrument, multi-engines, turboprop, and instructor ratings, and a helicopter private pilot licence.
jparies@dedale.net