How much?

by Alberto Iovino

When I became aware of the chosen theme for this issue of "Safety versus Cost", I wondered whether the Editor had made a mistake, or, at least, if it would fit in a "Tales of operational Safety" column. Not because it looked like a hard-to-talk-about subject, on the contrary, it is an important and a widely discussed one. The point was that it instinctively appeared to me to be something distant from operations, something that lives elsewhere – in Head Office and at the desks of senior management and when it is mentioned in an ops room one should start worrying. But whilst working on this article, I found out that I was quite wrong. So, if you wish, let's take a look, and you will decide.

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Human life is said to be priceless. Many people would agree, some perhaps with a degree of hypocrisy. In any case, whatever you think about this valuation, there are many alternatives. The U.S. Environmental Protection Agency (EPA) periodically sets what is called the "value of a statistical life." As the EPA itself clarifies, this is not intended to mean "placing a dollar value on individual lives", rather, it is a figure they use for cost-benefit analysis of new environmental policies.

To keep it (more or less) simple, if you ask a group of people how much they would pay to slightly reduce their individual risk of dying next year from adverse health conditions caused by environmental pollution (so that one fewer death may be expected, on average, among that group during that year), you will come up with an average figure that, multiplied for the number of respondents, will constitute a certain amount – the total amount that the group would be willing to pay to save one statistical life in a year. Between 2010 and 2011, by applying such methodology, the EPA set the value of life at $9.1 million, while other US agencies came to various figures in their different fields ($7.9 million for the Food and Drug Administration, around $6 million for the Office of the Secretary of Transportation).

Needless to say, these are not market prices to use when hiring a professional to get rid of your boss or your mother in law and, by the way, though I would expect such tariffs to be much more reasonable, do be careful about whose hands you put yourselves in. Instead, the goal of these agencies is to base political decisions on figures which they can claim represent - how accurately is anyone's guess - the view of the public on a subject.

In modern aviation safety, we are keen on being systematic and on turning into tangible figures concepts that are intrinsically abstract in the first place. Our approach towards a solution to the 'Manager's Dilemma' (production over protection may lead to disaster, protection over production may lead to bankruptcy) is widely based on setting target levels of safety, which are focused on both the quantity and severity of undesired outcomes rather than on the quantification of the economic value of resultant casualties.

In any case, finding an equilibrium is evidently not easy. With reference to the criminal trial following the Deepwater Horizon disaster, the New Orleans Assistant Attorney General declared that BP showed a company culture of prioritising "profit over prudence". Though the statement was in the first place related to how the company behaved in the aftermath of the oil spillage, it implies an opinion on how he considered they had positioned themselves overall.

A never ending story as it may seem, and while something more can always be done in theory, there has to be some sort of limit to the assumption that putting extra money into safety will make the system safer. On the one hand, sooner or later, the value of staying alive inevitably collides with the value of living, or you end up following the travel tips Snoopy typewrites, sitting on the roof of his kennel in a classic artwork by Charles M. Schulz: "How to avoid carsickness, seasickness and airsickness... Be careful what you eat. And stay home."

On the other hand, as for any kind of investment, those made for the sake of safety are not necessarily successful. In a 2006 book including analysis initially based on an article of his from the early

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nineties, Stephen J. Guastello remarked how "in spite of all the effort and money that goes into accident-prevention programs each year, there is scant information available on the relative merits of the known accident-prevention strategies. Decision makers are thus destined to make important decisions based on unreliable or disorganized information". Through his studies, Dr. Guastello – a Professor in the Department of Psychology at Marquette University in Milwaukee, IL – tried to compile evidence on the subject for a comparative evaluation. With specific reference to the FAA near-miss reporting program he identified, in spite of an established routine analysis of near misses, a lack of progress in reducing accident rates, which he tentatively ascribed to the extent to which action was being taken on the basis of the findings.

In other words, it should not only be a matter of how good one is at identifying problems, a task for which nowadays significant resources are often allocated, but also of how determined the recipient of the data is to find effective solutions and, eventually, to carry them through. If you can think of circumstances in your organisation which would fit such a view, then it is probably time for a thorough reflection on the subject. And then for some appropriate action, of course.

So one final perspective from which to look at this aspect of the subject might be by considering when it can really be said whether a particular 'safety investment' did or did not pay off. As a matter of fact, although some efforts are explicitly intended to achieve improvements in that field, in the case of aviation, a safety effect is embedded in most of the changes that are implemented. Anyway, it may be hard to reliably assess the real outcome of a safety plan, as it should be measured in the presence of an absolute stability in all other variables, which is very unlikely in complex systems. A criticism of Dr. Guastello's model arose from the fact that it assumed that the entire safety program was a single intervention, whereas in reality such a program would be likely to consist of a number of interacting interventions. This does not mean that we should not evaluate our safety performance and the results of whatever we do to try and improve it, rather that special care should be taken to neither overvalue, nor underestimate these efforts.

We have to accept that our endeavors in the field of safety do sometimes fail. Among the reasons why this is true are people not acting, or reacting, in the way they were expected to. In human factors documents, you can frequently find remarks about air traffic controllers being reluctant to change, presented as "scientific evidence" which, in my humble experience, has often, although not always, corresponded to reality. Organisational factors are widely held to be responsible for influencing individual behaviour more than anything else in a high-skill, performance-routine environment like ATM.

Yet, when it comes to thinking of possible weak links in the chain, I see where I was wrong. Actually, a different outlook may be applied to the otherwise well-established concept that controllers are safety professionals, and that responsibility is spread throughout the whole of an organization with everybody

Is 'value for money' always obtained in safety investment?

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How much? (cont'd)

being accountable for his/her own contribution to the achievement of the overall level of safety. In fact, any failure in the proper exercising of such responsibility may be harmful not only because it could directly produce unsafe conditions, but also in that it constitutes an unsuccessful result of an investment which the organisation made in the interests of safety.

The consequences of implementing a new operational procedure but not properly applying it are in the end not much different from those of buying a new piece of equipment and not getting it to work. Whatever effort lays behind them, however relatively big or small the quantity of intrinsically scarce resources involved, they are wasted twice, both because they did not yield the intended results and because they might have been used for something else. We should bear this in mind in our everyday working life. We can challenge the choices our organisation made and we should be prepared to, since that is the road to improvement. But we should also respect them and, as long as they are there, do our best to carry them through, because that is the direction defined for us and to go there we reasonably had to choose not to go somewhere else.

If, in the end, we share the conviction that the path we are taking is the right one, here's an extra good reason to be careful what we do as, needless to say, staying home is out of the question.