



Justice & Safety

A new just culture algorithm
by Professor Sidney Dekker

Is justice really important for safety?
by Professor Erik Hollnagel

**'Human error' - the handicap of
human factors, safety and justice**
by Dr Steven Shorrock



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Dear Reader,


EUROCONTROL and Safety have always been very close partners. Through the different functions and mandates allocated to the Organisation during the last 50+ years, safety has consistently held first place in the priorities of EUROCONTROL and its membership. Together with the Organisation the appreciation and understanding of the member States of aviation safety has matured and expanded. Safety regulation became also subject of EU competencies; safety implementation and oversight have been enhanced with the safety management systems concept, in Europe as well as globally.

The position of the different parties that may be held responsible in the aviation safety domain and in particular their civil and criminal civil liabilities has become much more prominent in today's society, in which corporatisation and privatisation of service provision and air transport are commonly accepted. EUROCONTROL has been very much part of that development through numerous activities varying from developing and refining new safety concepts to support and facilitating their implementation for member States, Service Providers and other stakeholders.

The EUROCONTROL Network Manager Directorate now embodies the vision of the EUROCONTROL member States, the EU and stakeholders on the future of ATM and is responsible for a number of key activities for ensuring an optimised and efficient ATM domain at the pan-European level. Safety is and remains a priority. Almost a decade ago, the above developments, together with a number of serious ATM related accidents resulted in a number of EUROCONTROL initiatives to better interact with and understand the processes related to the protection of safety data reporting and of the reporters themselves.

Recognising the importance of incident reporting to improving safety, **EUROCONTROL set up a Safety Data Reporting & Data Flow (SAFREP) Task Force** in 2005 to address the shortcomings in this area. The notion of and the need for a Just Culture in aviation was recognised. The EUROCONTROL Just Culture Task Force was created few years later in 2009 and the rest is history, as the saying goes. Safety and Just Culture are now one of the key responsibilities of the Network Manager Directorate and its Safety unit.

The initiative of HindSight magazine to devote a special edition to the theme "Justice and Safety" is a very timely one as it addresses the essence of Just Culture concept. What it offers the reader is a broad and colourful picture of well-written and important views from professionals that point you to different directions and solutions. That is not surprising in view of all the interests involved. I see it as an encouragement to concentrate on common and practical goals.

Just Culture appeals to me as another important and certainly ambitious example of the necessity of good networking and recognition of two key functions of any civil society: respect for safety as well as for the administration of justice. 



Joe Sultana is Director of the Network Manager Directorate.

He graduated with an Engineering Degree from the University of Malta in 1975 and joined the Air Traffic Services Unit in Malta in the same year. He obtained ATCO Licences in Aerodrome, Radar and Area Control and was a Watch Supervisor for four years.

In 1982, he was appointed Head of Air Traffic Services in the Maltese Department of Civil Aviation. He became Director of the Network Manager in 2013.



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EUROCONTROL

Just Culture in

Should the competence of an individual be put in doubt after an incident?

There are plenty of articles in this issue of HindSight exploring the relationship between the aviation safety system and the national judicial system. And rightly so, as we do not live in isolation but in a society which has matured over the centuries and has developed norms and corrective mechanisms. Fixing things in the society is a noble goal but I would like to ask you with my Editorial to look also 'in our own garden', to see how safety and justice is balanced in our own organisations.

Enough of the introduction. Let me look at what sometimes goes on in an organisation – a Controller's competence is placed in doubt after his involvement in an incident. This is surprisingly common not as part of a 'history' but as the result of just one 'performance error'.



Internal incident investigation takes place with the intention of enabling improvement – improvement of our technical equipment, operational procedures and training. Recently, there has been a lot of talk about evidence-based training. The essence of this in most cases is to train on the basis of what the evidence shows as the (general) training need and not what it is simply assumed to be important to train. The evidence here is coming from, amongst other sources, safety investigation and monitoring. If it is recognised that safety incidents are a means to inform the design of our training programme then isn't it also natural to think that these incidents can tell us something about the competence of the individuals involved?

Actually this is not quite true. Let us look carefully at what we call competence. ICAO defines competency as the combination of knowledge skills and attitudes required

to perform a task to a prescribed standard. Which of those elements of competence can be judged for an individual after their involvement in an incident?

Are single cases indicative of the possession of skills?

Consider a case where a Controller cleared an aircraft for take-off after he had previously cleared another aircraft for take-off on the intersecting runway. One can conclude that, obviously, the Controller's situational awareness competence 'failed'. Is it necessary to check the 'situational awareness skills' of the controller after this incident? Now what would be your reaction if I tell you that, in this real story, the same controller was involved in almost the same incident scenario approximately 5 years before the incident and no 'competence assessment' of any kind was taken?

An outrage? Perhaps not! Let's look at the numbers. Here are some rough calculations. Assume, for an airport like the one in this case, that the Controller, over 5 years, had 200 shifts a year, each with 5 hours of actual work in the position and an average of 20 departing aircraft. This gives us 100,000 'good' departure clearances and 1 'situational awareness skill' issue. Ten times in a million instructions! What is your problem? There may well be skills problems with an individual controller but incidents in which they are involved are unlikely to inform what these problems are. It is the job of the competence system to identify and rectify issues of underdeveloped individual skills.

Do we question the competence system or individual competence?

In two real events, two trainees, both well-advanced with their on-the-job training, had similar incidents a couple of weeks apart. Both trainees had been through college instruction, Unit training and almost 100 hours of in-position training. In both cases an aircraft was cleared to depart when a vehicle was present on the RESA at the far end of the runway. In both cases, the trainees involved reported not being aware that, for the purpose of a take off clearance, the RESA is considered to be part of the runway – part of the safe distance available. The conclusion from investigation highlighted a gap in the training program – both classroom and on-the-job-training.

Tzvetomir Blajev

Editor in Chief of HindSight
Fellow of the Flight Safety Foundation

doubt

In another case, a series of incidents were recorded at the same airport during the first few days of late-autumn low visibility procedures. Those involved commented that 'their' incident had taken place after almost 9 months of rather different conditions in which an entirely different set of procedures had been in use. Such a situation clearly 'stretches' one's cognitive capabilities and challenges the established routines. The analysis of these events disclosed some systemic issues and suggested that they should be addressed by synchronising the Unit training program with the seasonal variation of visibility conditions.

Here is another example. At a busy international airport, the ATC supervisor agreed that a VFR helicopter flight could take place in order to film the approach lights. The AIR controller was unaware of this plan and so there was no advance preparation or anticipation. The helicopter checked in on the TWR frequency and was cleared for a low approach to the runway at the same time as a departing aircraft was instructed to line up. Consequently, the helicopter reported "deviating to the right during go-around" and in doing so passed 50 feet above and 100 metres to the right of the aircraft which had lined up.

During the investigation, it was found that the Controller involved was unaware of national procedures which prohibit aircraft cleared for a low approach and go-around descending below 400ft when the runway is occupied. The investigation also found that none of the controllers at this airport had received refresher training on low approach or training touch-and-go traffic, because these procedures were not expected at an airport with a high intensity of commercial operations.

Degraded performance is not always degraded competence

What all these examples demonstrate is gap in the controller training programme, systemic problems in respect of knowledge retention and deficiency in the Unit training program. These represent a deficiency in the competence training and assessment system which would affect more than one individual.



So, one should not take a degradation in the momentary performance of an individual as indicative of their level of competence. Competence is about the ability to perform trained behaviours over time. There might be cases where performance drops, but overall the competence is intact. It is certainly possible for a single incident to raise competence issues for a particular individual but, in my opinion, this will be quite rare unless an event is part of a much bigger performance history. Great care should be exercised when considering the introduction of procedures to deal with rare events – there is a danger that the procedure will be gradually applied to all cases since it may become easier to avoid taking difficult decisions and instead put the 'blame' on the procedure.

If it is still concluded that there is a need for a procedure to resolve a potential problem, then it may be helpful to extend the involvement in its design to all those involved in the incident which has triggered the action and to set a clear deadline (maybe 24 or 48 hours) for the local competence committee to come up with a decision. Otherwise the 'competence in doubt' mechanism will start slowly undermining your safety system and eventually turn into 'just culture in doubt'.

Enjoy reading HindSight! ☺

A new Just Culture algorithm

by Professor Sidney Dekker

Creating a just culture in your own organisation can be hard enough – even before you worry about the influence of the judiciary. Here are some steps that you might consider. As you do so, always remember that justice can never be imposed. It can only be bargained. See if you can implement the following “algorithm” of steps that help in such bargaining:



1 Don't ask **who** is responsible, ask **what** is responsible.

In the 1940's, human factors engineers and psychologists started asking what is responsible for errors, not who is responsible. Human factors showed that people's actions and assessments make sense once we understand critical features of the world in which they work. People's actions are systematically connected to features of their tools and tasks. Targeting those features (the what) is an action that contains all the potential for learning, change and improvement. Therefore, the first response to an incident or accident – by peers, managers and other stakeholders – should be to ask what is responsible, not who is responsible.



Professor Sidney Dekker

is Professor and Director of the Key Centre for Ethics, Law, Justice and Governance at Griffith University, Brisbane, Australia.

Author of best-selling books on human factors and safety, he has had experience as an airline pilot on the Boeing 737.

2 Link knowledge of the messy details with the creation of justice

One of the more frustrating experiences by practitioners involved in an incident, is that those who judge them often do not really know what their work is like. They do not know the messy details, they lack technical knowledge, misunderstand the subtleties of what it takes to get the job done despite the organisation, the rules, the multiple constraints. Whether this is a supervisor, an inspector, the police, a judge, a jury – these are rarely “juries of peers.” These groups do not have the same intimate knowledge of the work they are judging, and they may also have incentives to build a narrative that puts the practitioner at a disadvantage. So make sure you have people involved in the aftermath of an incident who know the messy details, and who have credibility in the eyes of other practitioners.

3 Explore the potential for “restorative justice”

Retributive justice focuses on the errors or violations of individuals. It suggests that if the error or violation (potentially) hurt someone, then the response should hurt as well. Others in the organisation might have a desire to deny systemic causes, they might even fear being implicated in creating the conditions for the incident.

Restorative justice, on the other hand, suggests that if the error or violation (potentially) hurt, then the response should heal. Restorative justice acknowledges the existence of multiple stories and points of view about how things could have gone wrong (and how they normally go right). Restorative justice takes the view that people do not come to work to do a bad job. Indeed, most people are willing to work constructively after a near miss has occurred. Restorative justice fosters dialogue between the actor and the surrounding community (e.g. of colleagues), rather than a break in relationships through sanction and punishment.

4 Go from backward to forward-looking accountability

Backward-looking accountability means blaming people for past events. The idea of “holding someone accountable” is used for events that have already happened. It implies some sort of sanction, removal or dismissal. It is not clear what people hope to achieve with this sort of retrospective accountability, other than perhaps instilling a sense of anxiety and focus in others (pour encourager les autres). But this does not work: experience shows that it only motivates others to be more careful with reporting and disclosure. If, instead, we see somebody’s act as a representation of an organisational, operational, technical, educational or political issue, then accountability can become forward-looking. The question becomes: what should we do about the problem and who should be accountable for implementing those changes and assessing whether they work? Forward-looking accountability is consistent with a new type of safety thinking. People are not a problem to control, but a solution to harness. Forward-looking accountability can help people focus on the work necessary for change and improvement, and connects organisational and community expectations to such work.

5 Put secondary victim support in place

Secondary victims are practitioners who have been involved in an incident that (potentially) hurt or killed someone else (e.g. passengers, bystanders) and for which they feel personally responsible. Strong social and organisational support systems for secondary victims (psychological first aid, debriefings, follow-up), have proved critical to contain the negative consequences (particularly post-traumatic stress in all its forms). Implementing and maintaining support systems takes resources, but it is an investment not only in worker health and retention. It is an investment in justice and safety too. Justice can come from acknowledging that the practitioner is a victim too – a secondary victim. For some it can be empowering to be part of an investigation process. The opportunity to recount experiences first-hand can be healing – if these are taken seriously and do not expose the secondary victim to potential retribution or other forms of jeopardy. Such involvement of secondary victims is an important organisational investment in safety and learning. The resilience of second victims and the organisation are intricately intertwined, after all. The lived experience of a secondary victim represents a ‘treasure trove’ of data about how safety is made and broken at the very heart of the organisation. Those accounts can be integrated into how an individual and an organisation handle their risk and safety.

Your organisation’s journey to a just culture will never be finished, even if you implement the algorithm above. Justice, after all, is one of those categories about which even reasonable people may disagree. What is just to one is unjust to another. But by following the steps above, you can help create a climate of honesty, of care, of fairness and of a willingness to learn. If you do that, justice may just come around by itself. 5



Is justice really important

by Professor Erik Hollnagel

Justice follows safety

Justice has in recent years become of increasing importance in relation to safety, although more to safety investigations than to safety management. This has not happened because justice is something that actually improves safety, except perhaps in a very indirect manner. Indeed, the role of justice only begins after safety professionals have done their work. It has rather happened because justice can be the inevitable continuation of safety investigations that determine that the actions – or inactions – of someone have worsened the development of an event leading to a serious adverse outcome.

The number of such cases has been on the rise for several years. The main reason for this is that the technological developments, in aviation as well as in other industries, that were intended to make systems less dependent on human performance and thereby presumably less prone

to failure, instead have made systems more intractable and therefore paradoxically more dependent on human performance. Since the importance of human action thus has increased (not least in non-routine situations), investigations into adverse outcomes now seek extensive information (data) about how people thought and how they acted in a situation – far more than that which can be obtained by ‘mechanical’ means. Investigations have therefore come to depend on the participation and contribution of people. Controllers, pilots, and others may, however, be reluctant to report fully on what they have done for fear of ending up under the radar of judicial authorities, even in cases where they have worked in a prudent and professional manner. This reluctance stifles the flow of information with consequences for both safety investigations and the legal procedures that potentially may follow.

The pragmatic answer to this problem has been to try to remove any responsibility or liability from people who might be involved in incidents by building a just culture, defined as:

“A culture in which front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.”

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Professional interests: industrial safety, resilience engineering, patient safety, accident investigation, and modelling large-scale socio-technical systems. He has published widely and is the author/editor of 21 books, including five books on resilience engineering. Erik also coordinates the Resilient Health Care net and the FRAMily.



for safety?

Achieving this is, however, easier said than done, a fate it shares with most other types of specialised cultures. Attempting to describe, let alone define, just culture is hard, not least because justice is understood differently by pilots, controllers, managers, regulators, prosecutors, and judges. The existence or possibility of a just culture is nevertheless not the issue here, except perhaps to note that it is not a panacea.

What is Justice?

According to the dictionary, justice is the principle of moral rightness in the sense of determining in an impartial manner whether the responsibility for something that has happened can be assigned to a specific person or persons – and in principle also to a social entity such as an organisation. It is a paramount principle of modern societies that no one should be considered responsible except on the basis of

facts. But this principle implies both a belief in the reality of the facts presented and a belief that causal links can be established among them. The latter, known by academics as the causality credo, consists of the following three assumptions:

- Adverse outcomes (accidents, incidents) happen when something goes wrong. Conversely, acceptable outcomes happen because everything worked as it should and because people behaved as intended. This is also called the hypotheses of different causes, meaning that the causes for what goes right are different from the causes for what goes wrong.
- Adverse outcomes consequently have causes, which can be found and treated. Causes are real and can be established as facts – or even as truths. Because effects follow from causes, outcomes are resultant rather than emerging. (Emergent outcomes are not additive and neither predictable from knowledge of their components nor decomposable into those components.)
- Since accidents have causes and since these causes can be found, it follows that all accidents can be prevented.



Is justice really important for safety? (cont'd)

If we accept the causality credo, and the definition of safety that follows from it, then it is reasonable that both justice and just culture play a role. It is also reasonable that society tries to seek justice when serious harm has been done, or try to find out whether there is a case for justice in the sense that someone rightly can be said to be responsible for the harm done. The question that is considered here is, however, not whether this is reasonable, but whether it is relevant and meaningful for safety. There are two different answers to this question depending on the preferred definition of safety.

Safety-I: Freedom from Unacceptable Risk

Safety is conventionally defined as a condition where the number of adverse outcomes (accidents / incidents / near misses) is as low as possible. Since this is the first definition of safety, and until recently also the only one, it has been called Safety-I. It follows from this definition that safety becomes an issue when something has gone wrong. According to the causality credo, when something goes wrong there is a reason, a cause, that can be found. In cases where that reason or cause is an unusual human action or 'human error', it makes sense (under certain assumptions) to see that justice is done with regard to that human action.

In Safety-I, safety is usually linked to an event, namely the event or failure that results in an adverse outcome. But safety can also be linked to a non-event, namely the absence rather than the occurrence of adverse outcomes.

This has been nicely captured by Karl Weick's definition of safety as a dynamic non-event¹. Under those conditions the responsibility of the human is to make sure that nothing goes wrong (hence the dynamic nature of the non-event), and when something does go wrong it is consequently because someone did not do what was necessary or required, i.e. there was an omission of a preventive action (or a loss of control) rather than a failure. In both cases it may be reasonable to pursue what has happened and to involve justice in assigning the responsibility for the action to someone.

Safety-II: Ability to Succeed

But there is also another definition of safety, called Safety-II, according to which safety is a condition where the number of successful outcomes (meaning everyday work) is as high as possible. When safety is defined in this way as the system's ability to succeed under varying conditions, then safety management requires an understanding of why things go right, which means an understanding of everyday activities. The focus of safety investigations must place what exceptionally goes wrong in a context of what frequently goes right. Adverse outcomes are seen as the result of usual actions in unusual conditions rather than unusual actions in usual conditions. Safety-II therefore does not look for specific causes of adverse outcomes, but rather tries to develop an understanding of how people normally do their work effectively and safely. While this clearly is of interest to safety management and safety improvement, it is of little interest to justice. No one seriously wants to prosecute people for doing their work well, even if that means that they did not follow procedures and guidelines to the letter. (It may, of course, still be reasonable to prosecute them in situations where they did not do their work well, although that cannot be done without returning to the causality credo.) The Safety-II view makes clear that what people usually do is done for good reasons even if the outcome is occasionally unintended – and unsafe. Unlike Safety-I, Safety-II does not subscribe to the hypothesis of different causes. It is assumed instead that the reason why things go right and things go wrong are the same. It therefore makes little sense to prosecute people for doing what they normally do, just because it turned out badly.

1- Weick, K. E. (1987). *Organizational Culture as a Source of High Reliability*. California



| | USUAL ACTIONS | UNUSUAL ACTIONS |
|--------------------|----------------------------------|------------------------------------|
| USUAL CONDITIONS | Outcomes: Usually acceptable | Outcomes: Possibly unacceptable |
| | Safety-I: Not relevant | Safety-I: Potentially relevant |
| | Safety-II: Definitely relevant | Safety-II: Relevant |
| | Justice: No interest | Justice: Potentially of interest |
| UNUSUAL CONDITIONS | Outcomes: Possibly unacceptable | Outcomes: Very likely unacceptable |
| | Safety-I: Potentially relevant | Safety-I: Relevant |
| | Safety-II: Relevant | Safety-II: Relevant |
| | Justice: Potentially of interest | Justice: Definitely of interest |

Table 1: Responses to combinations of actions and conditions

Conclusion

The need for judicial process to parallel safety investigations can be seen as a product of a particular view of safety (Safety-I) and of the search for causes that follows from that. This assumes that the hypothesis of different causes is right, and that people can make a moral judgement on whether what they did was right or wrong. But if the hypothesis of different causes is wrong and that instead people always try to do the best they can, then we cannot claim that it is reprehensible to do what they normally do in cases where the outcome is unsafe, unless we also claim that it is reprehensible in the cases where the outcome is acceptable. The logical consequence of that is that we should not allow people to do what they normally do, but instead oblige them to do what we think they should do (to work as we imagine work should be done). The consequences of that are unpalatable, to say the least.

The difference between the two views can be summarised as follows. Safety-I assumes that adverse outcomes are the result of unusual actions under usual – and perhaps also unusual – circumstances. It therefore becomes essential to study unusual actions (a.k.a. ‘errors’) and to complement the investigation with criminal prosecution if there is clear evidence of gross negligence. This is presumed to act as a deterrent and in that way support the improvement of safety. Safety-II assumes that adverse outcomes are due to usual actions under unusual circumstances. It therefore becomes essential to study usual actions or everyday performance in order to understand unsafe outcomes and there is little need of or value in trying to accompany the

investigation with a process of law. Safety can be improved by strengthening or reinforcing what people do well, rather than by obliging them to comply with rules and procedures.

Table 1 shows a matrix with four cells which represent the possible combinations of usual/unusual actions and usual/unusual conditions. Each cell shows the degree of acceptability of the outcome and the extent of concern which this represents to the perspectives represented by ‘Safety-I’ and ‘Safety-II’ and to Justice. It can be argued that it is more constructive – and productive – to ensure the presence of acceptable outcomes rather than the absence of unacceptable outcomes. The conclusion which may be drawn from Table 1 is therefore that justice may play a role in cases where safety is missing (adverse outcomes) but not where safety is present (everyday work).

There is probably not much hope of changing the common basis of justice today, which dates from the early sixth century codification of Roman law in Justinian’s Corpus Juris Civilis. Despite the attractiveness and advantages of a Safety-II perspective, we must realistically accept that it will co-exist with a Safety-I perspective for many years to come. But we can at least begin to be mindful about it, so that we do not do things out of habit but rather because they make sense vis-a-vis our purpose. While finding causes and holding people responsible may be reasonable for society and for the general sense of justice, it is of very limited practical value, if not directly counterproductive, for safety and safety management. **S**

Everything you always wanted to know about **just culture** (but were afraid to ask)

by Tony Licu, Marc Baumgartner & Roderick van Dam

1 Just Culture. What a strange name – What does it mean?

Just Culture signifies the growing recognition of the need to establish communication and training initiatives and advance arrangements between the aviation safety sector, regulators, law enforcement and the judiciary to avoid unnecessary interference and to build mutual trust and understanding in the relevance of their respective activities and responsibilities.

Here is a less diplomatic version: Just Culture is about creating a workable balance between Safety and Sanctions through an important message: Stay away from professionals that make an honest mistake, but someone who consciously takes an irresponsible risk should be sanctioned. It is that simple – it is that complicated.

And yes, the child was named “Just Culture”. Funny name: what is Just? What is Culture? You can write books about that. That is perhaps not a good idea. Look instead at the content and deliverables and check out how well these deliver the job at hand. That is much more important than the name as such.



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2 How is Just Culture supposed to work?

Accidents and Incidents happen. Two main questions always pop up when things go wrong: The first one is: Why did this happen – how can we prevent it in the future? The second one is: Should anyone be blamed, be held responsible for this?

Question one is a safety domain question; question two is asked by national judiciary authorities, by victims and perhaps also by a CEO. Whether we like it or not, both questions are completely legitimate. Both serve a primary (national or international) interest: safety and the administration of Justice

The “divide” between international safety rules and national law pertaining to civil and criminal liabilities forms one of the causes of the difficulties encountered in the safety aviation domain. It lies also at the root of the almost complete absence of communication, let alone cooperation, between those that represent the aviation safety experts and the national state prosecutors. The Just Culture approach respects those limits and explores the – promising – solutions of educating both parties and building trust and understanding towards exercising their tasks in recognition of their mutual responsibilities.



Roderick van Dam

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Currently, he is President of the International Foundation for Public Aviation (IFPA) and he is Chairman of the EUROCONTROL Just Culture Task Force and a member of the ICAO Safety Information Protection Task Force.



for the proper administration of justice. The Assembly furthermore noted the need to take into account the necessary interaction between safety and judicial authorities in the context of an open reporting culture. A special Safety Information Protection Task Force (SIPTF) was created as a result of these conclusions. In its final report, the SIPTF recommended a number of solutions, among which close cooperation between Safety and Justice and Just Culture prominently figure. As a first result, the new ICAO Annex 19 on Safety Management Systems now contains the definition of Just Culture that also is used by the EU.

The 38th ICAO Assembly of September/October 2013 actually, among other, has now instructed the ICAO Council to take appropriate steps to ensuring and sustaining the availability of safety information required for the management, maintenance and improvement of safety. The Council is asked to propagate the necessary interaction between safety and judicial authorities in the context of open reporting culture, based on the findings and recommendations of the Safety Information Protection Task Force.

The EUROCONTROL Just Culture Task Force has members and observers from US, Australia and Asia and is represented in conferences and workshops globally. Finally: Just Culture has already conquered New York! When Captain Sullenberger was honored by the City of New York after his epic ditching in the Hudson River, Mayor Bloomberg gave him a new copy of the book he had to leave in the cockpit. The title: Just Culture, of course!

I'm not a criminal – why should I ever be prosecuted?

We believe you! In any civil society that respects the Rule of Law, you would be a person that has committed a criminal offense if you are convicted by a criminal court after a lawful process. Lately, the words “criminal” and “criminalisation” are increasingly used in discussions and publications about the interference of the judiciary in aviation accidents and incidents.

The discussion on criminalisation of aviation incidents and accidents shows concerns on the perceived intrusion by the judiciary in the all-important effort to enhancing safety in

Is Just Culture a European thing?

No. For a number of reasons, the Just Culture concept was picked up earlier in Europe, but that does not mean it is restricted to Europe alone. Europe, as a patchwork of sovereign states with sovereign judiciary powers that also have corporatised airlines and service providers has been a good breeding ground for JC. The EU has now enacted JC in its legal order. In ICAO the issue of misuse of safety data and protecting safety reporting has been on the agenda for many years and it has become apparent that a key part of its successful implementation relies on a number of realistic deliverables that will stimulate a further understanding and an active and open coordination between the safety and judicial authorities.

Therefore, in the discussions and findings of the 36th Assembly, the AIG Divisional meeting in 2008 and the recommendations of the ICAO HLSC in March 2010 resulted in resolutions A37-2 and A37-3 of the 37th General Assembly on the sharing of safety information and the protection of safety data. Both resolutions, using the description of the JC initiative instructed Council to strike a balance between the need for the protection of safety information and the need

Everything you always wanted to know about just culture (but were afraid to ask) (cont'd)

aviation. It also shows a tendency to use “criminalisation” as the personification of misdirected and unwarranted activities by the authorities and to argue that the safety domain should therefore be protected from any action by the prosecution. While there are unfortunately sometimes spectacular accidents where a suspicion of misuse seems partly or wholly justified, these cases are relatively too few to insist on total legislative protection.

On top of that: Invoking real or alleged criminalisation of aviation incidents or accidents as a justification for fully protective legislative action does not really work. With hardly any exception, all European or ICAO rules or standards on the protection of safety data and investigative processes in aviation contain provisions that exempt the exercise of the administration of justice by national authorities. What is needed now is the establishment of equilibrium between two equally relevant goals: aviation safety and the administration of justice.

Is my CEO aware of all of this?

We expect so, at least in Europe. If not, he or she should be! These are issues that are very closely related to safety management and related activities that are particularly relevant for any airline or ATC provider. Just Culture at corporate level is very much part of the general JC concept. Corporate activities in the safety management domain include the handling of incident reports and mistakes by controllers and other ATM front line employees. In a corporate environment with an understandable emphasis on safety, but also regarding efficiency and performance-based financial goals, the “corporate culture” will interact with the JC elements as adopted in the company.

This brings us to an important issue; not necessarily a problem but certainly a challenge. Applying JC at corporate level means that there should be a corporate charter or manifest policies to address unacceptable behaviour by staff and management. These could be seen as the corporate “equivalent” of the criminal law principles of gross negligence or willful misconduct. In other words: “Honest mistakes” should not result in sanctions by management, but manifestly irresponsible behaviour will result in sanctions under applicable corporate law.

The challenge lies in assuring that no conflicts arise between the applications of corporate rules that would be based on, e.g., national labour or corporate law with those governing

in national criminal judiciary processes. Corporate sanctions cannot be compared with criminal law sanctions. Unacceptable behaviour at corporate level must therefore be reconciled with applicable criminal rules that govern the responsibilities of the criminal judicial authorities. Assistance for establishing harmonised norms for corporations would be very helpful. Presently, a discussion is ongoing to “revive” the initiative of a European Just Culture Charter that could also be of use to address this issue.

Pilots and Controllers are sent to jail as we speak. Is that Just Culture?

It could be – but only if they were drunk or did whatever it takes to be deemed criminally negligent under applicable criminal law. By the way, it would also apply, apart from the front line operators, to your management or corporation. That may sound a bit rude. But the bottom line is that we have to realise and accept that nobody can be above the law and that if you commit a serious crime you should go to court. Again, under the Just Culture principles grossly negligent or intentional criminal behaviour should be punished; but not so for “honest mistakes”.

It is also clear that such a call can only be made by a prosecutor or a judge. Mind you: When a prosecutor will only prosecute in cases of gross negligence or willful misconduct, the chances for a pilot or controller to be ever indicted for his or her actions will be very small indeed. Such a prosecution policy is already effective in a number of European States and we are working very hard to invite other States to follow these examples.

Just Culture requires understanding and appreciation of the different processes and commitments by both safety people and the judiciary. And let there be no mistake: Just Culture also implies that misuse of criminal processes or ignorance from the part of the Judiciary is completely unacceptable! An equally important part of the Just Culture concept is to expose and stop misuse and ignorance. An initiative to educate and assist prosecutors and judges in the exercise of their responsibilities has already made a very promising start.

What are the disadvantages of JC?

We don’t think that disadvantage is the right term here, as the alternative – full legislative protection – is simply not attainable. There are certainly weak spots as Just Culture is

based on cooperation and the establishment of e.g. restrictive aviation prosecution policies and voluntary reporting schemes. It also requires the basic recognition that pilots and controllers as well as prosecutors and judges can make mistakes. That is not necessary self-evident for all involved...

Just Culture is not a wonder drug against injustice and misuse of judiciary processes. It has been introduced to protect as much as possible the mundane but ever so important ongoing processes of incident or occurrence reporting: literally thousands of daily events that feed into the well established system of using the reports for the improvement of safety and the prevention of incidents and accidents. That requires active and enduring support from all involved.

It is certainly not a disadvantage, but this is also the moment to emphasise the need for close interaction between the available and upcoming legislation in Europe as well as at ICAO level and the Just Culture initiatives. There is no competition here: Just Culture basically continues where legislation stops. It builds on the very affective and widely implemented ICAO rules and of course the well-timed and comprehensive EU regulations on performance review, accident and incident investigation and – still warmly debated – the new occurrence reporting regulation.



"I consider ICAO rules, I consider National Laws, ICAO rules, National Laws, ICAO, National..."

A lot of words - Has anything been done yet?

We kind of expected that question... The answer is a firm yes! Look at this:


Each year at least one general Just Culture Workshop is organised in a European Capital in which safety people, CAA's, EC, EASA, ECA, IFATCA, ECTL and National Prosecutors jointly discuss the pros and cons of Just Culture. These meetings with a 200+ audience are instructive and effective.

The ECTL JCTF has now started the implementation of two main deliverables: -

- One of them is a joint IFATCA and EUROCONTROL initiative with two goals: Expert advice and communication through setting up groups of independent aviation experts in the air transport and ATM domain, which are exclusively available on request to Prosecutors and ultimately a Court. The sole purpose is to providing judiciary with technical and operation expertise and insight. At the time of printing this HINDSIGHT edition two prosecutor expert courses have been held and have also proven to

be very useful for the interaction between both groups that results in further communication and mutual education. Numerous prosecutors and judges from a growing number of States attend, act as teacher and discuss with experts from all over Europe.

- The second is about inviting states to implement a national safety prosecution policy, among other, confirming that only gross negligence and willful misconduct will be prosecuted. Discussions take place in regional focused and well prepared workshops with prosecutors and safety/CAA representatives of 4 to 6 States. IFATCA is also an active contributor in these road shows. A handful events have been held in 2013 three others are lined up already in 2014. First results are very encouraging.

Both deliverables were unanimously endorsed by all EUROCONTROL member States and the EU. The next step will be to submit these deliverables for global consideration in ICAO. Our focus has to lie in the pursuance of the practical goals identified by the Just Culture activities. The real work is only starting now. There is still a long way to go, in Europe and certainly globally. But experiences and responses up to now are outright encouraging. 

Just culture in aviation: dynamics and deliverables

by Tony Licu and Roderick van Dam

What is this?

This article is not another song of praise for the Just Culture concept. Mind you, it is a good one – don't let anybody fool you! But this contribution aims to provide you with the latest insights, deliverables and expectations. It contains a reality check on do's and don'ts in Just Culture, deliverables and – most important – a wakeup call for a comprehensive understanding of the interaction with Air Transport and ATC, both at front line operator, corporate and national criminal law level. Work in progress, certainly, but with plenty of indications where we are going and what to expect and certainly also what not to expect.

ciary, operators and service providers; on pilots and controllers as well as managers.

The myth of total protection

The administration of justice, in particular in the criminal law domain, constitutes one of the pillars of State sovereign functions; they are usually firmly imbedded at constitutional level. The ICAO Convention and the EUROCONTROL Convention and many other international legal instruments, confirm the complete and exclusive sovereignty of a State over its territorial airspace. That cer-

to "protect" the aviation safety domain intervention by the national criminal authorities.

The problem is that invoking real or alleged criminalisation of aviation incidents or accidents as a justification for fully protective legislative action does not really work.

Let's do a quick reality check:

- At this moment in time, most (but not all) States have formally established in their applicable legislation a priority for the Judiciary (Police and Prosecutorial Officials) in the investigation of accidents and incidents;
- Most (but not all) States have legislation that prevents use by the Judiciary of the evidence the investigator has collected and collated; and
- All the regional and global rules and standards (in force or under discussion) related to the protection of safety data and investigative processes in aviation make an exception for the intervention of the criminal judiciary of a sovereign State.

"War is too serious a matter to entrust to military men"

Georges Clemenceau

First off, we need to understand the complicated relationship between the administration of justice and the safety investigation. As in a classical drama, two antagonists are involved: one with the aim of enhancing aviation safety through independent investigation and reporting and the other with the aim of preserving justice by investigating and prosecuting possible perpetrators.

Recognising and accepting the dynamics of Just Culture in Aviation will help us to progress towards realistic deliverables that are based on a sound assessment of the different roles of the legislator, the regulator, the judi-

certainly includes the administration of justice. States are of course free to choose to delegate or pool certain sovereign functions, as is the case with the European Union membership, but criminal jurisdiction, with only a few exceptions, generally remains firmly imbedded at State national level, also in the EU.

The discussion on the administration of justice related to protection of safety reports and reporters of aviation incidents and accidents shows concerns about the perceived intrusion by the judiciary in the all important effort of enhancing safety in aviation. It also shows a tendency

That does of course not mean that there is no role for legislating protection of safety issues. Both at ICAO level as well as in Europe, effective and focused rules and regulations on protection of safety data already exist or are under discussion. But there are limits to what can be addressed by safety legislation. Nobody can be above the law and interpreting acceptable or unacceptable behaviour or actions remains a responsibility for the national judiciary.

Criminalisation crusade

The discussion on criminalisation of aviation incidents and accidents shows concerns on the perceived intrusion by the judiciary in the all-important effort to enhancing safety in aviation. It also shows a tendency to use “criminalisation” as the epitome of misdirected and unwarranted activities by the authorities and to argue that the safety domain should therefore be protected from any action by the prosecution.

This is an important and sensitive issue. Many, perhaps too many, discussions and opinions on Just Culture and the cases discussed evoke examples of highly visible and often tragic aviation accidents, the aftermath of which results in criminal prosecution and convictions of first line operators, managers and sometimes even regulators. In some of these cases, blatant misuse obviously occurred. In others, application of national norms of criminal law differs from those applied in other states or regions. That may not change soon – international harmonisation of criminal law remains a delicate and different issue.

As mentioned above, invoking criminalisation of aviation incidents or accidents as a justification for full legal protection does not really work. All the regional and global rules and standards related to the protection of safety data and investigative processes in aviation create an exception for the actions of a sovereign State in the exercise of the administration of justice. What is needed now is the establishment of equilibrium between two equally relevant goals: aviation safety and the administration of justice.

Just Culture requires understanding and appreciation of the different processes and commitments by both safety people and the judiciary. And let there be no mistake: Just Culture also implies that misuse of criminal processes or ignorance from the part of the judiciary is equally unacceptable! These are mostly highly visible but limited cases almost always only related to serious accidents. Misuse of powers and processes in aviation accidents, by national authorities must be flagged and condemned.

One of the huge added values of Just Culture is its potential to safeguard the ongoing, perhaps inglorious but essential processes of incident reporting. It will be hard to overestimate the importance of that reporting mechanism and the deliverables of Just Culture to help ensure its continuation.

Corporate just culture

The vast majority of EU Member States have now corporatised and, in a number of cases, fully privatised their Air Navigation Service functions. The provision of ATC has now been mandated to dedicated organisations established under national corporate or private law. In particular the financial and operational responsibilities for running an ANSP have become the responsibility of a CEO or senior management as set out in the corporate constitution. A similar process has also taken place in the air transport sector that was regulated and liberalized under the EU legislative system well before ATM in a gradual process that started in the mid-seventies.

For the application of Just Culture principles, the corporate activities related to incident reporting will include the handling of incident reports and mistakes by controllers



Just culture in aviation: dynamics and deliverables (cont'd)

and other ATM front line employees. In a corporate environment with of course up-front goals on safety, but also regarding efficiency and performance-based financial goals, the “corporate culture” will interact with the JC elements as adopted in the company.

That creates an important issue that is not necessarily a problem but certainly a challenge. Applying JC at corporate level means that we have to find the corporate “equivalent” of the criminal law principles of gross negligence or wilful misconduct. In other words: “Honest mistakes” should not result in sanctions by management, but manifestly irresponsible behaviour will result in reprisals under applicable corporate law.

So far, so good. But the challenge lies in assuring that no conflicts arise between the applications of corporate rules that would be based on, e.g., national labour or corporate law with those governing in criminal judiciary processes. Corporate sanctions cannot be compared with criminal law sanctions. We must therefore reconcile the appreciation and description of unacceptable behaviour at corporate level with the applicable criminal rules that govern the responsibilities of the criminal judicial authorities. The administration of criminal law is an exclusive prerogative of a sovereign state that should be respected.

Quite a few well-established corporate Just Culture programs and procedures already exist in Europe. These are good examples and precedents for further initiatives, also in smaller service providers and airlines. A Just Culture policy is not a document but a continuing effort. As in the safety and safety management domain, economic and financial priorities sometimes may challenge the full implementation of Just Culture at corporate level.

The ongoing discussions in the European Parliament and the Transport Council clearly show the need for clear guidance

for operators and service providers, in particular smaller ones that could be invoked in the event of misuse of powers. At the same time, norms for unacceptable behaviour at corporate level and in a non-criminal sense must be reconciled with the qualification of unacceptable criminal behaviour by the national judicial authorities and in particular the state prosecutors and ultimately a court of law in the exercise of their sovereign functions.

Progress report

We have said it before: Just Culture is not the “magic wand” against injustice and misuse of judiciary processes. It has been introduced to protect as much as possible the mundane but ever so important ongoing processes of incident or occurrence reporting: literally thousands of daily events that feed into the well-established system of using the reports for the improvement of safety and the prevention of incidents and accidents. It represents an ongoing daily routine, certainly not as spectacular and awesome as the aftermath of an accident, but absolutely vital for the continued effort to improve safety by learning from mistakes and other relevant occurrences.

Every now and then someone emphatically declares that Just Culture has failed or that at least its success is limited. That may be based on impatience, pessimism or simply wrong expectations. Just Culture indeed represents a culture shift, moving away from “my work is more important than yours” to agreeing to a balance of activities based on building mutual support and confidence. That will take time. It would be time well spent.

The more so as it will be spent on a number of realistic and promising Just Culture deliverables: continuation of regional conferences to discuss the Just

Culture components and seek the support of those involved; the proliferation, again at regional level of the model for an aviation prosecution policy and the formation of a team of experts to support prosecutors and judges in aviation cases. Please note that none of these require any changes in national or European law.

Work is ongoing and looks outright promising. Here is why. Last year, EUROCONTROL and the EU have unanimously endorsed two important initiatives:

- The model for a national aviation prosecution policy centres on limiting prosecuting incidents only in cases of “gross negligence”. It is important to note that “Gross negligence” is used as a generic term for behaviour that may be enacted differently in national criminal law, in particular in Europe. Discussions with many different national prosecutors have shown that most of them would only prosecute only at that level of behaviour. That is quite encouraging for the prospects for implementing the model policy.
- The establishment of a group of dedicated experts to support prosecutors is now in full swing. Pilots and controller organisations as well as the judiciary have indicated their support and appreciation for such a group that would be exclusively available on demand to provide focused information on technical and operational facts surrounding an incident without indoctrination or subjective opinions.

Coupled with other elements of the model policy such as advance contacts or arrangements between safety investigators and the judiciary and respecting formally protected safety information, the first conclusion must be that

we are on our way after a promising start.

What next

Just Culture has been introduced find an acceptable balance for pilots, controllers and management in the exercise of their functions and responsibilities. At corporate level, Just Culture furthermore plays an important role in incident reporting by pilots and controllers and the application of company rules and national contract- and labour law. Just Culture does not replace any safety or criminal rules. It aims to create a balanced interaction at state or corporate level of rules and regulations, policies and commitments and communication and support.

In Europe initiatives are under discussion to establish a Just Culture Charter as a comprehensive repository for all relevant legislation, corporate and judiciary commitments or policies and guidance material relevant to an open safety culture in aviation. It is yet too early to tell whether this will fly, but a workable just culture charter could have the form of a living document with clear political ownership, professionally and independently managed through e-media and with fully updated listings of applicable law and regulations as well as established policies and commitments that are signed off by their respective national or corporate owners for their duration. It should also cater for amendment, extension and, where appropriate, implementation of JC related initiatives and commitments.

Closing remarks

Just Culture represents the fundamental recognition that both the aviation safety drive and the administration of justice will profit from a carefully established equilibrium, moving away

from criminalisation fears. It is based on the understanding that controllers and pilots can blunder and that the line between an "honest mistake" and intentional or reckless behaviour can only be drawn by a judiciary professional. That may be easier said than done, of course. But the time has come to seriously query the added value of those ongoing and generally unsuccessful efforts at International level to fully protect controllers and pilots against judiciary actions by creating standards, regulations and laws that are supposed to shield them against judicial interference.

A balanced corporate and judiciary environment will provide a sound and sustainable basis for a continuation of controller or pilot incident reporting as well as accident/incident investigation. Both sides have in the past shown trends to caricaturize each other as the devil incarnate: The "safety czars", pilots and controllers interests groups by evoking visions of scores of pilots, controllers and managers behind bars and demanding full protection against criminal interference and the judiciary in their ivory towers as the crime hunters with complete disregard for the intricacies and realities of civil aviation.

It is very encouraging to note the consistently high professional standards and dedication of pilots, controllers and other ATC and Air Transport professionals. Almost without exception they represent realistic and hard working men and women that take great pride in their job and quite ready to continue to work in an environment that will provide them with the reasonable expectation that the chances that they would find themselves subject of a criminal process would be very small.

It is equally encouraging that our ongoing contacts and discussions with the judiciary in Europe and beyond

again yield a picture of realistic, reasonable and responsible hard working professionals with a keen interest in the specifics of aviation safety, in learning more about the safety environment while at the same time ready to draw the line when necessary.

The EUROCONTROL Just Culture Task Force JCTF deliverables have now started a dialogue between these parties that should be nurtured and further developed. Both the safety people and the judiciary have to leave their trenches and start working together on their joint interest: keeping aviation safe. Notions or one-liners such as the criminalisation of safety or dismissing prosecution as a threat to aviation safety are not very useful in that discussion. The same applies to prosecutors and judges that claim absolute autonomy.

There is another issue: We have to keep things simple and realistic. It may be very tempting to descend into the realms of the human mind and the motives and conditions governing human behaviour and have visions of eliminating culpabilities and understanding human error. But we still have a long way to go.

This article quotes a famous French Prime Minister: Georges Clemenceau – nickname Le Tigre, who played a crucial role towards the end of WW I and the ensuing peace negotiations. Famous quotes are often used and misused to fit the ambitions of those who use them. Paraphrasing Prime Minister Clemenceau, we would humbly suggest that this case, his wisdom fits all:

Be it the Safety Crowd (including Pilots and Controllers), or the Judiciary, both Aviation Safety and the Administration of Justice are too important to be left to one party alone.

Enter Just Culture. 

Inconsistency under the law

By Captain Ed Pooley

This issue of Hindsight contains, as the Editor intended, a lot of discussion about both the criminalisation of error and the ‘just culture’ which is nowadays recognised as an essential element of the broader organisational culture we need if high levels of operational safety are to be delivered. When these two are put together, some of the debate is about one subject or the other and some about the interface between the two. The result is frequently confusion about both process and effect in both aspects.



Captain Ed Pooley is an experienced airline pilot who for many years also held the post of Head of Safety for a large short haul airline operation. He now works with a wide range of clients as a Consultant and also acts as Chief Validation Adviser for SKYbrary.

Since the nature of the interface is extremely complex, and since in my view the effects in either direction are not always as direct as some people perceive, I’m going to focus here on the evident inconsistencies which characterise the criminalisation end of the spectrum of ‘justice’ in its widest sense.

First we should be clear on two things:

- We are never going to see **formal** harmonisation of the administration of criminal justice between jurisdictions. Whilst there is no great difference in the civilised world, at least in theory, in respect of the guiding principle of fairness and equality under the law, both the statute law of a State and the use of any flexibility afforded under it ultimately reflects the nature of society of that State.
- Aviation cannot and should not expect to be treated as some sort of special case. There are too many other activities out there which also depend on the performance of the professional – but ultimately fallible – human for risk control.

But back to basics! Crime is essentially about intent and consequence. This model fits deterrence and punishment very well. But as we know, unintended human performance failures are rarely about intent and much more often involve either a single and significant ‘instant’ lapse or a sequence of poor situational management. They are, though, still about consequence. Either people died or sustained serious injury and/or there was substantial loss or damage – aka an ‘accident’ (although not necessarily in the legal sense). Or these things were narrowly avoided – aka a serious incident. Although there are always exceptions, it is at least encouraging to note that, even in States where criminal prosecution for serious incidents which have no actual consequence except that an unrealised heightened risk to life or property are possible, few occur.

If intent is lacking, it is sometimes argued that whilst making an example of a ‘perpetrator’ may not affect their individual propensity to re-offend, it will indirectly encourage others in similar roles to ‘be more careful’. I be-

lieve that such a view is at the very least questionable in the context of qualified and trained professionals even though it may have merit in other behavioural contexts. If you accept my view on this, then all that remains is consequence. The criminal law is generally administered on the basis of consequence and on that basis, the worse the consequence, the more that people expect to see responsibility identified and therefore at least one successful prosecution and sentences to match.

We know that in a majority of accidents and serious incidents in aviation, some or all of the cause is down to a transitory failure in the performance of those in front line roles. But where, as in almost all cases, these failures were without intent, their context becomes rather important – we need, without diminishing the principle that every mentally competent individual is responsible for their own actions – to be asking who shares responsibility. The first place to look for context (but not necessarily to add to the accused) is those who formed part of the responsible front liner’s team. It’s easy in the case of a pilot in command, it’s the co-pilot (or possibly

members of an augmented crew) who may have attempted to influence matters, may have chosen not to, or may simply not have had superior situational awareness. If such people were ignored without good reason, then that would count negatively¹.

But it goes much deeper than this. The search for potential criminal behaviour is often insufficiently wide. Any person making errors on the front line (and those around them) was there because those who were responsible for using their services to deliver the 'product' they were selling had (in theory at least) validated the level of competency which it was reasonable to expect them to consistently deliver and structured the mitigation of risk accordingly. My experience in accident and incident investigation tells me that there are still relatively few competency-assessment systems in aviation which are capable of providing that assurance. And the responsibility for the existence of such systems is that of both the employing entity

and the managers it appoints to act on that responsibility.

So, if more prosecutors spent more time looking at the context of inadvertent error, there would be a shift away from the front line victims to their managers and, where the criminal law makes it possible, also to the employing entities. The latter is of course where deterrence really becomes effective, since running a business carelessly can attract such large financial penalties that the very survival of the business is threatened. Of course, since criminal guilt for any offence can be shared, such a shift of focus would not entirely remove the possibility of prosecution from front liners but it would certainly reduce it so that the balance of responsibility could be fairly reflected in the sentencing after any successful prosecution.

So what about this proposition of context transferred to reality? Let's look at a few examples where it was ignored so that only the pilot(s) or controller(s)

involved were prosecuted:

- Instead of making an en route diversion whilst there was still enough fuel on board to safely do so, the experienced pilot, having misunderstood the way the FMS worked, continued to a more distant airport confident that it was attainable despite contrary suggestions for earlier diversion from his (very) junior colleague. Fuel was exhausted but a skilfully managed glide just enabled the aircraft to crash land short of the runway but inside the airport perimeter with no fatalities or serious injuries to the occupants [[http://www.skybrary.aero/index.php/A310,_Vienna_Austria,_2000_\(LOC_HF_AW\)](http://www.skybrary.aero/index.php/A310,_Vienna_Austria,_2000_(LOC_HF_AW))]

Aftermath: the pilot in command, a German national employed at the time by a German airline, was prosecuted in Germany for "negligent interference with air traffic", convicted and given a sentence of ten months probation increased on appeal to six months imprisonment.



1- Of course, I appreciate that the potential position of a controller (or an aircraft engineer) who is 'on task' without the benefit of dedicated (human) monitoring is more problematic.

- A trainee controller operating under the supervision of an OJTI who was also acting as TWR supervisor but who was not actively supervising – in LVP predicated on lack of manoeuvring area visibility from the TWR visual control room (but not low surface visibility) was fed inaccurate information about runway occupancy by an Assistant Controller and, having failed to validate it became distracted from the imperative of situational certainty by self-imposed pressure to take advantage of an about-to-expire departure window and cleared an aircraft to take off on the about-to-be-occupied runway. A high speed RTO was made and a collision narrowly avoided. The subsequent investigation found that both the normal method of working and the supporting technical infrastructure was deficient and made extensive recommendations accordingly.
[http://www.skybrary.aero/index.php/B763/_B744,_Amsterdam_Netherlands,_1998_\(RI_HF\)](http://www.skybrary.aero/index.php/B763/_B744,_Amsterdam_Netherlands,_1998_(RI_HF))

Aftermath: The Trainee Controller, their OJTI and the Assistant Controller were prosecuted for “the provision of air traffic control in a dangerous manner, or in a manner that could be dangerous, to persons or properties”. The Assistant Controller was acquitted but the other two controllers were convicted and sentenced to a small fine or 20 days imprisonment in default. On appeal, all three controllers were found guilty but their action was reclassified as an “infringement” rather than as an “offence” which simultaneously had the effect of removing any possibility of a penalty but also any possibility of an appeal.

- Approach Control acceded to a request from the pilot of a twin jet on an IFR Flight Plan who claimed that he had the field in sight to make a visual approach. The pilot subsequently flew the aircraft into unseen terrain killing all on board. The subsequent investigation showed that the pilot could not have had the field in sight when this had been claimed and that radar cover on the more direct routing taken would have rapidly become intermittent.
[http://www.skybrary.aero/index.php/C550,_vicinity_Cagliari_Sardinia_Italy,_2004_\(CFIT_HF\)](http://www.skybrary.aero/index.php/C550,_vicinity_Cagliari_Sardinia_Italy,_2004_(CFIT_HF))

Aftermath: Both controllers were convicted of “multiple manslaughter and causing air disaster” on the basis that, under the general provisions of Italian law, they had a duty of care towards pilots in respect of terrain clearance which they had not met even though the direct responsibility for terrain clearance was internationally recognised as being assigned to the pilots and only a relatively minor technicality in specific ANSP procedures had been breached. The conviction and a suspended sentence of two years imprisonment was twice upheld at hearings before superior Courts.

Now let’s look at a few examples where nobody, front line or other person or entity, was prosecuted in broadly comparable circumstances:

- After a failure to carry out engine shut down procedures with the care reasonably expected for such a critical action after evidence of en route engine malfunction, the ‘good’ engine was shut down instead of the malfunctioning one and a diversionary descent commenced. The subsequent attempt to get thrust from the malfunctioning engine on final approach as flaps and landing gear were deployed failed and the aircraft crashed killing or seriously injuring most occupants. Both pilots survived with major injuries.
[http://www.skybrary.aero/index.php/B734,_vicinity_East_Midlands_UK,_1989_\(HF_LOC_FIRE_AW\)](http://www.skybrary.aero/index.php/B734,_vicinity_East_Midlands_UK,_1989_(HF_LOC_FIRE_AW))
- The runway controller cleared a vehicle operating on a different radio frequency to enter the runway for bird patrol purposes via a third party but then forgot about it and cleared an aircraft for take off. The aircraft achieved good clearance over the vehicle and there was no actual risk of collision. Subsequently, the independent investigation found a context for the error which indicated ANSP runway occupancy procedures which varied markedly from ICAO and EAPPRI guidance and from equivalent processes at other busy European airports.
[[http://www.skybrary.aero/index.php/B733/_vehicle,_Amsterdam_Netherlands,_2010_\(RI_HF\)](http://www.skybrary.aero/index.php/B733/_vehicle,_Amsterdam_Netherlands,_2010_(RI_HF))]



■ ATC radar acceded to requests for descent below MSA and manoeuvring of a demonstration flight on an IFR Flight Plan. The aircraft crew ignored TAWS 'PULL UP' Warnings in IMC and terrain impact followed killing all on board. It was subsequently found that the controller, who was busy and without an assistant or a supervisory presence had mistakenly read from his displays that the aircraft involved was a military fast jet rather than a transport aircraft manufactured by the same company. Since the fast jets were known to regularly operate in a designated military exercise area in the vicinity, he assumed that despite a declared level of FL100, a descent in the area filed on the flight plan might be expected in order to make use of a designated military exercise area in the vicinity. It was also found that no MRVAs had been defined and that the MSAW aural alert had been de-activated. However, since terrain in the area where the accident occurred had not been input, no visual MSAW alert would have occurred either.

[http://www.skybrary.aero/index.php/SU95,_manoeuvring_near_Jakarta_Indonesia,_2012_\(CFIT_HF_FIRE\)](http://www.skybrary.aero/index.php/SU95,_manoeuvring_near_Jakarta_Indonesia,_2012_(CFIT_HF_FIRE))

I can assure the reader that a more in-depth look at examples that did and did not end up as prosecutions would merely substantiate the charge of inconsistency both within and between States. So what can be done about this if my earlier assertion that there is no possibility of **formal** harmonisation is correct?

Well, the answer is that there is clearly a lot of scope for encouraging **voluntary convergence** in the way that criminal justice is applied to human error in any occupation where risk management depends on human performance and there is no conscious intent for action or inaction to materially increase the chances of an unsafe outcome. At the heart of this is the concept of "the public interest". This is the principle by which a prosecutor who has accumulated enough evidence to have a high probability of securing a conviction then applies a final test of "is this prosecution in the public interest?" which must be satisfied before a prosecution is begun. This is a complex intervention (currently excluded by statute in many civil law jurisdictions) which seems to be most successful when it is facilitated not by a set of rules but by formalised comprehensive guidance to prosecutors². Interestingly, States that build in a consideration of public interest before bringing a prosecution also allow the police

There is clearly a lot of scope for encouraging **voluntary convergence** in the way that criminal justice is applied to human error in any occupation where risk management depends on human performance and there is no conscious intent for action or inaction to materially increase the chances of an unsafe outcome.

or judicial investigation which must precede the determination of whether a prosecution may be warranted to be abandoned at an early stage on a similar basis by not requiring the completion of a thorough investigation into every possible 'crime' where it seems that the cost of a prosecution would significantly outweigh its benefits.

So how can we encourage this enlightened convergence as far as aviation is concerned? I think that one of the most useful – and relatively simple – actions would raise awareness of inconsistency in the treatment of professional pilots, controllers and aircraft engineers. Leaving this (at best) to the superficial and transitory interest of the specialist media is not enough. I propose that it is time to, as a minimum, make widely available the evidence on which each prosecution is based alongside a transcript of the final Court Judgement³, both presented in English. An open access online repository is needed and I suggest that SKYbrary would appear to be the obvious choice. But this project will need help from both lawyers and aviation people in all the countries where cases have been heard as well as the services of translators. **S**

2- For example, the 'Code for Crown Prosecutors' applicable to all criminal prosecutions in England, Wales and Northern Ireland: http://www.cps.gov.uk/publications/docs/code2013english_v2.pdf

3- It is critical that the basis for the verdict reached and any sentencing that follows is available exactly as given. A summary is not sufficient to understand the thinking of the Court.

The friend by Bengt Collin

Wednesday 6 May 1987

My best friend is Fredrik. We normally see each other every day, today is no exception. We either play outdoors or at my parents' house, never home at Fredrik's place. While I am the only child, Fredrik has one younger brother and two older sisters. His parents don't like us being there, they never say so but I can feel it.

Fredrik arrive at 10am. The weather is sunny and warm, we move outside to play. We can't agree on what to do, finally we decide to start with Fredrik's proposal, then continue with mine; land hockey played with ice hockey sticks on the walkway in front of my parents' house. After we finished Fredrik's boring thing, he said he should return home for lunch. He would never have lunch with his family at 11am! OK, I tell him: "If you leave now, I will never play with you again". Fredrik left. A promise is a promise.

Thursday 7 May 1987

Fredrik arrived at 10am as usual. I always keep to my promises. Fredrik left disappointed, I will never play with him again.

Tuesday 14 December 2004

I am looking forward to getting my first tower controller licence. The volume of traffic at the airport is not large, but



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involved in operational ATC safety activities.

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at peak hours it can be quite challenging. The job is interesting and my colleagues seem to be OK, although I haven't seen much of them yet.

After finishing my training at the ATC Academy, I started the local on the job training two weeks ago. Today we have classroom training. The classroom is different – the room is relatively neutral, with grey floor and light green walls. In the first corner to the right from the entrance someone put a statue of a cat. It is yellow.

The teacher explains low visibility operations, mostly focusing on how to maintain the throughput in poor visibility. "We have a labelled surface movement radar", it's called advanced SMR" the teacher explains. "Sometimes the throughput is slightly reduced in CAT II conditions, but that is because of the increased distance between the landings, it has nothing to do with the ground movements". "The advanced SMR is nowadays called A-SMGCS".

I ask how it works. Does the system label aircraft automatically and how about vehicles? "We label the departing aircraft and also the vehicles manually" the teacher continues looking at the cat statue rather than me. "This is no problem really, you will see for yourself when we get up in the tower".

Friday 6 May 2005

Today I receive my full rating for the tower. It's a sunny warm day, I am very happy to finally be allowed to work on my own. At the end of my shift we will have a short feedback session with the training department.

My last instructor, Peter, was a bit different to my earlier ones. He will retire in a couple of years. Peter has a reputation of being able to "move the traffic"

– you'll never see any long queues for departing traffic when he is in charge of the runway. He tells me to not be too serious of how to label the aircraft, "the labelling is not really reliable anyway". He also instructs me to leave the stop bar for the departure holding in the off position. "I know we should use stop bars H24, but the HMI will drive you nuts, believe me", he adds and laughs. Peter is a nice person always full of anecdotes.

At the feedback session I do not mention anything about Peter's different views on how to handle the traffic and equipment. Being a completely new controller I do not like to start a big discussion, after all, perhaps Peter's way of working is the best way of doing things – he should know with all his experience.

Wednesday 7 September 2005

The two Inspectors from Headquarters arrived Monday lunchtime two days ago. I gather from Peter as we and two other colleagues have a coffee together that the common view of the Inspectors is, if not entirely negative, along the lines of "they do not know anything". "They haven't worked operationally for ages, besides that they do not know how we have to make shortcuts to maintain the throughput", explains Peter. The other controllers agree – Peter has a strong character.

As I understand it, the purpose of the visit is to help us rather than check for mistakes, but I could be wrong. How do we really operate the traffic, do we have the correct procedures and more important, do we follow them.

Thursday 8 September 2005

"I still do not understand how you can maintain the throughput in low visibility", one of the Inspectors asks. The



full report is expected in around two months' time so this is just some preliminary thoughts and questions in a briefing for ATC and the airport.

There are five people at the meeting. Apart from the two Inspectors from the headquarters, the other participants are the ATC Manager, the ATC Operational Manager and a representative from Airport Management. The room is a small rather warm room without windows. The Operational Manager's mind is far away. He is thinking of his upcoming vacation in Malta which will be nice and warm.

"According to ICAO Document 4444, the SMR is only there to assist the controllers' external view, not to replace it", the Inspector continues. The ATC Manager looks on his Operational Manager waiting for a reply. Nothing happens. The silence is broken by the Airport representative; "Why be so strict, after all it is about avoiding delays, something that everybody knows is important". "We need to think about our reputation. If we start delaying flights, our airlines may look for other options, other destinations and the finances are tight". "We always do things safely", the Operational Manager adds. "Efficient doesn't mean unsafe, safety is our top priority" the ATC Manager continues.

After the two Inspectors had left, the airport representative asks how this would affect them in the future. She

was really worried. "Forget about it" the ATC Manager replies. "When we get their Report we read it, reply that we appreciate all the good advice and then continue as before. We have always done that". "Besides that the operational personnel are completely uninterested in anything written on a piece of paper -can they read?" The ATC manager laughs. The others laugh too.

Monday 3 October 2005

Fredrik, my old friend from my home town, started his on the job training today. I didn't know he had also become a controller, it is a complete surprise to me. We have had no contact whatsoever after he left that day in the '80s.

He is transferring from a small airport in the south and I understand he has moved here with his wife and two kids. He will have the same instructor I had, Peter.

Friday 9 December 2005

One thing that confuses me is that we don't use the conflict warning system for the runway. Our union representative advised us today at a meeting to keep it switched off. "It gives a lot of nuisance alarms. If you miss a real one and a serious incident happens, you'll never have any guarantee that it won't be used against you". "Better to be safe than sorry" the union representative continued. Outside the mist and drizzle continued, this will be a long winter.

Thursday 30 March 2006

The weather is still terrible – drizzle and fog. Outside we can't see anything but grey cloud. The aircraft and vehicles are somewhere down there but fortunately we have our ground radar – although it is full of distorted returns due to the weather.

I am working as the ground controller. Fredrik is in charge of the runway. It is in the middle of the morning peak with a lot of arriving and departing traffic. The supervisor tells us that he has received a alert about the function of the threshold lights. He says that a vehicle needs to check out exactly what the problem is. Strange – why can't they check the lighting systems without entering the taxiways and runway, especially during low visibility operations? It must be possible to do that. The assistant controller in charge of vehicles and incoming phone calls replies to a call from a vehicle asking for clearance to enter one of the taxiways parallel to the runway. I can hear the call, we do not use headsets. "It's OK", I tell the assistant controller before he asks for permission. "Thanks" he replies and gives the clearance to the vehicle.

I have two departing aircraft taxiing out which are well behind the vehicle. I can see it on one of the many screens in front of me. Peter is busy. I can over hear the transmission from an inbound flight. He passes the spot wind and gives a landing clearance. The vehicle is driving north towards the holding point.

Case Study
The friend (cont'd)

"Tower, an aircraft just passed close above me", we can all hear the upset voice from the vehicle driver. "Where is he", the assistant controller shouts out loudly in the tower; it's a question for nobody, just an expression of desperation. "He should wait at the holding point".

Everything is silent in this situation. It's like everything has stopped momentarily. Or perhaps it's because we don't know really what's happened. "I'm vacating the runway at the holding point" the vehicle driver transmits.

Friday 7 April 2006

"We from the management have absolutely nothing to do with this serious incident". The Operational Manager is in a meeting with the Inspectors from Head Quarters who have come to find out what has happened. "When we received the full report of your visit last year, we put a copy in the tower for the controllers to read". "They are required to sign to confirm that they have read and understood it. That has been our standard procedure for years". "They should know not to handle this amount of traffic during these weather conditions as you clearly pointed out in your excellent report".

No one say anything, everybody waits for someone else to speak. They can hear the distant sound of voices from the coffee room down the corridor. "Can you confirm that the stop bars were working properly" one of the Inspectors asks in a quite friendly way. "And what about your alerting system", she continues. "Can you please explain to us how it operates"?

Monday 10 April 2006

When thinking about it today, I believe I saw something on the screen entering the runway at the threshold. Perhaps it was the vehicle? I hadn't alerted Fredrik, why should I have done, after all the runway was his responsibility. I never forget people who do not keep their promises..... **S**

Case Study Comment 1 by Eileen Senger

Being a controller for upper airspace, I can only assume how the situation with the inspection vehicle should have been handled. But there are certain points in this story that apply to all of us working in the field of aviation safety, be it as controller, pilot or infrastructure or company manager. I have only picked out a few.

Let's start with the impression that within this ATC provider there does not seem to be an open culture for voicing one's opinion. In the interests of safety but also the working environment, it is only beneficial to create a proactive space where young minds with little seniority but a fresh view and fresh ideas are especially encouraged to speak up, share their opinion and think out loud. There should always be the chance to raise questions

about current procedures, systems or working habits – if not face-to-face then even more ideally in an anonymous system. There should be a clearly understood structure so that every individual



knows who is their contact person for questions or concerns. The protagonist in this story is asking himself the right questions and identifies the offer for help from the visiting Inspectors as such, but because of his junior status, he prefers to keep a low profile.

The story also shows just how important it is to have your training of any one individual carried out more than one instructor and preferably several different ones – different in personality and different in working style. In this way, the trainee will not copy one (possibly bad) behaviour but can 'cherry pick' what they like best from each one. There are frequently



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many different ways of dealing with a particular problem, as well different opinions about the working styles of colleagues. A trainee should always be encouraged to give their opinion and point out anything they see as conflicting guidance to their instructors. Instructor Peter may be well-respected and a leader, but as a member of an older controller generation he doesn't appear to care too much about soft skills. He would be one of those colleagues sitting at the Team Resource Management Workshop with his arms crossed in front of his body muttering that he thinks this is b...shit for softies and all he cares about is sitting on position and moving traffic. Fortunately,

the recognition that a shallow hierarchy and a basic knowledge of human factors are important ways to improving safety has been widely promoted in many ATC providers and airlines.

The claim that safety is put first has to be brought to life and led consistently by the example of senior management. If the top of the company does not live up to its own professed standards, how can they expect the bottom to do so? As it operates at the ATU Unit in the story, it is just an empty shell held up to protect the management against any criticism. Everyone is busy safeguarding their own position and making sure that if something

happens they cannot be held responsible or, in consequence, legally liable if it comes to that. Colloquially we call this butt-covering. The Inspectors are visiting to check the prevailing way of working and the procedures in use for flaws but this only seems to be a paper exercise. They say that they are there to help but neither the airport representative nor ATC management are interested in giving them any real chance to point out deficiencies and recommend improvements to deal with them. The findings of the visit are on paper so they are covered, they distribute it to staff and shove the problem down the line. Such behaviour always occurs at the expense of the weakest link, invariably the people on the front line who have no Master's in management or in law just a hands-on, very practically-oriented education. And the weakest of those are the newly qualified controllers.

RECOMMENDATION:

All of us have been in situations where we were faced with the possibility that if we had spoken out we might have made ourselves look ridiculous or seem stupid. Because our idea seemed odd or because we didn't understand something and someone had to explain it again. If this is combined with any personal animosity between colleagues, be it from a situation years ago or because it's just someone you've never been on the same wavelength with, the only thing that can save the situation is our professionalism. Check again if you are in any doubt. Speak up if you are in any doubt. That is the only real way to cover your butt! ☺

Case Study Comment 2

by Captain Dirk DeWinter



Captain Dirk de Winter

is has over 11,000 hours flying time over the last 22 years. He started as a cadet pilot with SABENA in 1987 flying Boeing and Airbus aircraft. Before starting his flying career Dirk obtained an academic Master degree in Electronic Engineering at the University of Brussels. Since January 2009 Dirk has been working part-time in EUROCONTROL Agency.

Training can never be a friend of “non-adherence”, how about management? The behaviour of many professionals is significantly determined by both the curriculum which determines what training they receive and the attitude of their trainers.

The behaviour of Peter, the trainer, in this case study is a classic example of “non-adherence” and “practical drift”. Being close to retirement he has reached his maximum experience level. He knows best – no need to label aircraft or use the stop bars since that might interfere with the goal he sees. He firmly believes his primary duty is to maximise traffic throughput. All these ‘nuisance’ procedures must have been developed by those ignorant ‘admin people’. He’s the real operational guy. He has been working like this for many years now with great results. Nothing has ever happened to him, so his work method must be safe. Yet we know he was just lucky that nothing that would have needed the procedures he willingly omitted had ever happened.

Our lead character is young and inexperienced so he looks up to his instructor Peter. He’s reluctant to challenge him – with his reputation and experience he must be right.

The training he received must be confusing for him. The local on the job training was

not consistent with his initial training at the ATC academy. The first instructor there had avoided answering his questions leaving some ambiguity in his understanding of the procedures. Peter, his second instructor, is providing negative training. Instead of highlighting the importance consistently applying safety critical procedures such as the 24hr use of stop bars, he focuses on moving the traffic. He even ridicules the two inspectors from the Headquarters, why would he need their help?

As expected the two young trainees operate just as their instructors have taught them during their on the job training. They display the same “non-adherence” and “practical drift” behaviour. Safety critical procedures are omitted to keep the traffic moving. One day a situation develops that passes through the reduced number of safety nets and an incident happens.

Management is very surprised. How could this have happened? All the procedures and the safety nets are in place. The recommendations from the Headquarters Inspection were distributed to all staff and they signed for receipt.

But are all the recommendations in respect of procedure actioned? Signing for receipt is an administrative verification but does it mean the procedures will necessarily be applied in operations? Such a more difficult assurance process was clearly not in place. What is more alarming is there was no audit

of the training being delivered. The local on the job training was not using or promoting the standard procedures or Best Practices for runway safety. This meant the routine non-adherence to standard procedures was being passed on to the next generation of controllers. They learn by example don’t they?

Was Management aware of this practical drift? Probably not. The ATC manager was not very receptive to the advice from the Inspectors “...we appreciate all the good advice and then continue as before...”. The Airport Manager was focused on the delay the proposed procedures would generate in low visibility conditions and the financial consequences. The existing procedures had been in place for many years now and had enabled the movement of a high volume of traffic without any incidents. So the procedures must be safe. The fact that management was not aware that the staff had to cut corners to achieve the traffic throughput was very convenient. In case of an incident their part of the job was done, they had published the procedures to be followed ...

RECOMMENDATION:

Training Staff have a “role model” function. They should not only selected because of their teaching skills, but also for their way of strictly applying the standard operating procedures and focus on safety in general. S

Case Study Comment 3

by Job Brügggen

Lonely for not speaking up about lack of use of the stop bar in peak hours. Lonely when the awkward questions finally arrive and nobody is giving an answer, or – worse – the blame is put on somebody else which the narrator is clearly very uncomfortable with. Yet, the narrator is clearly also part of a closely-knit community and acts completely naturally as part of it. He respects the clear existence of a hierarchy in the group, gives credit to seniority and does not ruffle the feathers of the leaders in difficult times. Very human, very normal.

The whole process cannot be a surprise to anyone familiar with the ATC world. Students are selected to 'match' the current controller community. Students are taught to fall in line with everyday practice. The student will be listening attentively to the people around him and accepting the role models provided by the bosses – he wants to be a controller, after all. The end result is a validated controller who behaves exactly as he has been taught to.

It would be easy to state that safety culture needs a boost here. Probably the operational people themselves think their safety culture is excellent. But 'drift into failure', or 'normalisation of deviance' are the descriptions that come to mind when reading this case. Management should take an active role here in knowing what is going on and not accepting any deviances from what are agreed procedures. "Er, yes we know declared capacity of this sector is 40 movements per hour but experience has shown we can safely push 50 or sometimes even 60 movements per hour."

Who is finally accountable for such decisions? Would that be the CEO?

This is quite a sad case. The narrator must feel lonely. Lonely for abandoning his friend. Lonely for not getting explanations where he thinks it is normal to get explanations. The statue of the cat. The labelling system. The purpose of the Inspectors' visit...

Yes it would, but he handed responsibility for this to his ATC Manager. The CEO still has to make sure that the ATC Manager follows the agreed procedures in his company. He needs to have the means to verify that the ATC Manager does follow them. And of course the ATC manager needs to make sure that the Operations manager follows the procedures and so on to the level of the controller. Going back up the corporate ladder, safety performance reporting is not just about the number of incidents, but about how well the process is being managed and controlled. I would not be surprised if this particular (fantasy) CEO only gets serious incidents reported and is informed about the running of his (safety) management system only by how many audits have been carried out.

It would be a capital mistake in this case, to put blame on the controller, the narrator, Peter, or Fredrik. They are just products, as they are expected to be, of the blueprint of the company.



Job Brügggen is the safety manager of ATC The Netherlands (LVNL) and is particularly known for his activities in Just Culture developments. He was one of the first to demonstrate the detrimental effect of prosecution of air traffic controllers on incident reporting. In 2003 he re-created the CANSO Safety Standing Committee and chaired it for six years. He is currently leading the effort for the FAB Europe Central safety management activities. He also advises in the health care industry on safety matters with a particular focus on Just Culture and safety leadership.

People are not acting badly with intent, they just conform to what they think is expected of them. Give them room to action their good safety intentions over their normalized behaviour of deviance. They can be helped by taking safety performance monitoring seriously.

RECOMMENDATION for this virtual company is simple. Start at the top. Investigate how the CEO has dealt with his accountabilities and handed this down to his managers. Is that all clear and simple? Does that include the priority for safety over capacity? Study how they subsequently take this into their divisions and how they report to their CEO. How is safety performance reporting included in this? Can the CEO reasonably expect to be aware of all situations where he may ultimately be called to account? What measures is the CEO able to take to put things right? Does he indeed do that or is it only theory? On the lower level, the recommendation would be to enable monitoring of 'adherence to procedures'. Confront the workforce with the results and demonstrate that procedures are there for a purpose and you expect them to be adhered to. Safety Culture at work in its purest and simplest form. 5



'HUMAN ERROR'

The handicap of human factors,

by Dr Steven Shorrock

"Oh my God. I told those guys at safety that it was dangerous and one day we would lose concentration and pay for it. I already told those guys at safety that it was very dangerous! We are human and this can happen to us. This curve is inhuman!"

We are human

These are the distressed words of the injured train driver moments after the train derailment in Santiago de Compostela, northern Spain on 25 July 2013. The driver can be heard pleading in sorrow, hoping for the safety of the passengers, "I have turned over. My God, my God, the poor passengers. I hope no-one is dead. I hope. I hope." Seventy-nine people died.

In the aftermath of the accident, initial investigations ruled out mechanical or technical failure, sabotage and terrorism. That appeared to leave only two possible explanations, 'human error' or 'recklessness', or both. When society demands someone to blame, the difference – whatever it might be – can seem trivial. What followed was a display of our instinct to find a simple

explanation and someone to blame. Soon, the explanation and the blame pointed to the driver. The Galicia regional government president Alberto Nunez Feijoo stated that "The driver has acknowledged his mistake". Meanwhile, Jorge Fernandez Diaz, Spain's Interior Minister, said that there "were reasonable grounds to think he may have a potential liability" and confirmed he could face multiple charges for reckless manslaughter. While safety investigations are ongoing, the driver faces preliminary charges of 79 counts of homicide by professional recklessness and numerous counts of bodily harm.

Several claims appeared about the driver in the media, often without relevant context. It was reported that the driver "admitted speeding"¹. The speed limit on the curve was 80kph and the train's black boxes showed that the train was travelling at 192kph moments before the crash. The implication was that the speeding was reckless. The media pounced onto an old Facebook post by the driver. One post, reported by Spanish media and attributed to the driver, stated: "It would be amazing to go alongside police and overtake them and trigger

off the speed camera", accompanied by a photo of a train's speedometer at 200 km/h (124 mph). This may be an unwise social media post, but such speeds are normal and fully permitted on the high-speed line sections.

However, there appears to be no evidence that the 'speeding' involved conscious disregard for, or indifference to, the dangers of the situation or for the consequences of his actions. This would have been an extreme act. Rather, it seems that the driver was unaware of the context. This hypotheses invoked 'human error' explanations, though carelessness was implied. It was reported that the driver himself told the judge that he was distracted and suffered a "lapse of concentration" as he approached the curve². Just minutes before the derailment, the driver received a call on his work phone. The ticket inspector told El Pais that he had called the driver to instruct him to enter an upcoming station at a platform close to the station building to facilitate the exit of a family with children. The call lasted nearly two minutes; a long time when you are travelling at 192 km/h. Renfe employees are not allowed to use phones except in case of emergency, but ticket inspectors have



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1- Spain train crash driver admits speeding in emergency call recording, Telegraph, 06/09/13
2- Spain train crash: Driver told judge he was 'distracted', Telegraph, 06/09/13
3- Spanish train wreck driver got warnings before crash, Reuters, 02/08/13
4- Reckless' Train Crash Driver Held By Police, Sky News, 26/07/13

safety and justice

no access to the train cab. The driver told the court he lost a sense of where the train was during the call, and believed he was on a different section of the track. It was also reported that the "driver got warnings before crash"³, having received three warning signals. By the time he had engaged the train's brakes, it was too late.

As is common in accidents and incidents, front-line staff immediately blame themselves, which does not mean they are to blame. Spanish press stated that immediately after the derailment, the driver allegedly said to officials at the railway station 3km from the crash "I ***** up, I want to die. So many people dead, so many people dead."⁴

In this case, the justice system will now need to determine if the driver's actions crossed the line into 'recklessness'. It is another issue as to whether or how justice will be served. But one only needs to look into the context of this accident to see that 'human error' or synonyms such as 'lapse of concentration' or even 'carelessness' do not seem reasonable to explain this terrible event. And if that is all it takes for such an outcome, then it could surely happen again. The 'human error' explanation does not seem to serve safety, so what does it serve? Perhaps it partly serves society's need for simple explanations and someone to blame, while absolving society itself for its demands.

Human error or an inhuman system?

Shortly before the train crashed, according to reports, the Spanish train had passed from a computer-controlled area of the track to a zone that requires the driver to take control of braking and deceleration. Furthermore, there was no automatic braking system on the curve in question, the European Rail Traffic Management System automatic braking program stopped 3 miles

south of where the crash occurred. This placed responsibility on the driver significantly to reduce speed at a crucial time. The sharp bend was known to be "dangerous" and has previously been subject to debates and warnings. According to Spanish journalist Miguel-Anxo Murado, "There were arguments for having that section of the route remade completely, but Galicia's particular land tenure regime makes expropriations an administrative nightmare. So the bend was left as it was, and speed was limited there to 80km/h." The driver's recorded phone call indicated that he had foretold such an accident in a warning to the company's safety specialists:

'HUMAN ERROR'

The handicap of human factors, safety and justice (cont'd)

"I already told those guys at safety that it was very dangerous. We are human and this can happen to us. This curve is inhuman." The judge is now reportedly expanding the preliminary charges to include numerous top officials of the state railway infrastructure company, Adif, including rail safety senior officials, for alleged negligence⁵.

Reminiscent of the Chernobyl inquiry, a small number of media reports broadened the focus to what might be called reckless expansion in society more generally: "I can't help feeling that, at some profound or superficial moral level, we also played our part in the tragedy as a society; that this was the last, most tragic episode of a decade of oversized dreams, fast money and fast trains", said journalist Miguel-Anxo Murado⁶. If this stretches the argument, it at least gives a counter-balance to the 'human error' or 'recklessness' explanations of this tragic event.

The error of psychology

There are thousands of pages of research in the psychology and human factors literature on the issues mentioned so far, including the 'reversion to manual' problem of automation, distraction, 'multitasking', situation awareness, and safety culture. But the popularisation of the term 'human error' has provided perhaps the biggest spur to the development of human factors in safety-related industries – with a downside. When something goes wrong, complexity is reduced to this simple, pernicious, term. 'Human error' has become a shapeshifting persona that can morph into an explanation of almost any unwanted event. It is now almost guaranteed to be found in news stories pertaining to major accidents.

This is very unsatisfactory to many psychologists and human factors specialists; the implication in research and practice was that human error is 'normal' and systems must be designed

to avoid, reduce or mitigate error. But in the context of safety and in justice, 'human error' has been taken to mean something different – a deviation from normal, from rules, procedures, regulations and laws.

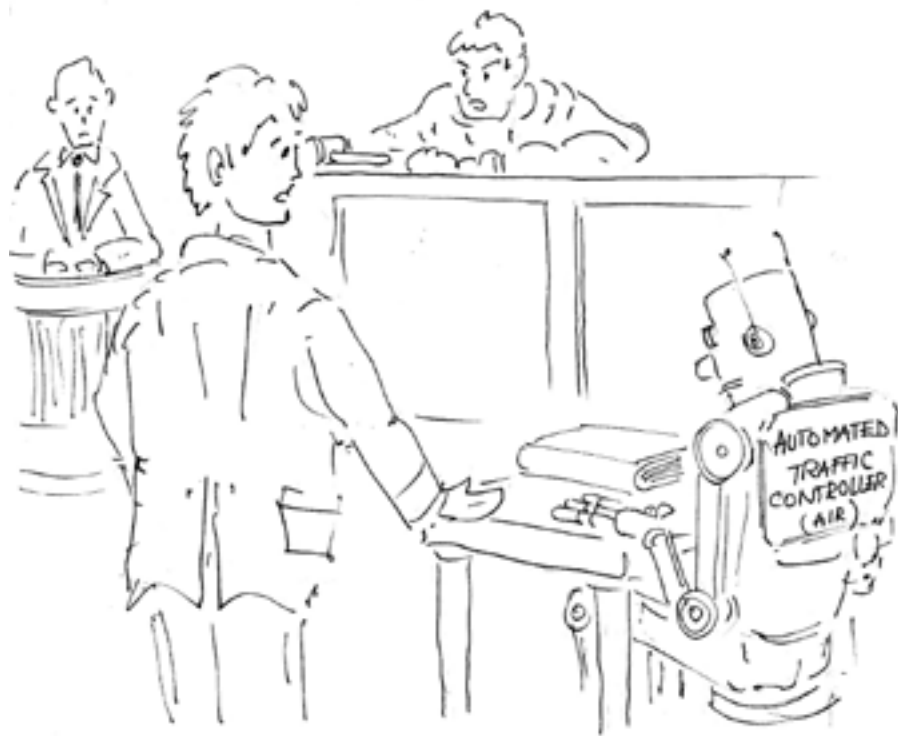
The demise of error

Despite decades of research, there has been little agreement on the meaning of the term, or whether it has any real meaning at all. While 'human error' has intuitive meaning in simple systems and situations, there are problems with the use of the term in complex systems such as ATC. These are now well documented in the literature, and the concept fell into disrepute^{7,8}.

After being fascinated by the concept since studying psychology in the early 1990s, I gradually and reluctantly accepted these arguments in the first few years of the 2000s. Reading the works of leading thinkers in the field, I abandoned the term. My own reasons followed the arguments of those Erik Hollnagel and others.

- **'Human error' is a mostly a post hoc social judgment.** A 'human error' can be hard to define in advance of it happening.
- **'Human error' requires a standard for 'correct' performance.** In ATC, there are many ways to get an acceptable result.
- **'Human error' points to individuals in a complex system.** System behaviour is driven by the goals of the system and the system structure. Controllers provide the flexibility to make it work.
- **'Human error' stigmatises actions that could have been heroic in slightly different circumstances.** The line between a 'heroic action' and a 'human error' often depends only on the end result.





**"Human Error Your Honour! Human Error...
That's what expert said... How then we can blame this poor Automaton
for something which is beyond his own nature..."**

- **'Human error processes are mostly vital for task performance.** You may find sometimes that you hear what you expect instead of what is said. However, without expectation, radiotelephony would be very inefficient.
- **'Human error' is an inevitable by-product of the pursuit of successful performance in a variable world.** The conditions of performance are often vague, shifting and suboptimal. The ability to adapt and compensate comes at a cost.

Still, the term 'human error' is used frequently in human factors and psychology. But over recent years, some practitioners have abandoned the use of the term, except to refer to the term itself. They recognise that the term itself is damaging. While psychology and human factors did not intend some of the simplistic meanings ascribed to the term, the genie is out of the bottle.

"Don't call me handicapped!"

Over roughly the same period, the term 'handicap' became seen as offensive in some English-speaking countries⁹. One reason is that it has been mistakenly associated with the phrase 'cap in hand', referring to beggars. This is a false etymology. The myth is that in 1504, after a brutal war in England, King Henry VII passed legislation that begging in the streets be legal for people with disabilities. In fact, handicap was shortened from 'hand in cap'; a game played in the 1600s with two

players and a referee that combined elements of barter and lottery. The game involved equalising the value of an exchange.

The word grew to refer to any action that worked to make a contest more equitable. From 1754, the word was used to describe horse races where weights were added under the saddle of faster horses. Subsequently, faster runners were made to start behind slower runners. The word evolved further to mean a physical limitation, first used in 1915 in the context of children. People of older generations may still use the word 'handicapped', and with good intent. But in several Anglophone countries, the term is unwanted and seen as unhelpful in any of its meanings. It has been replaced by 'disabled people' and 'people with disabilities'. Different terms have different connotations and encourage different ways of thinking.

'Human error' as handicap

Perhaps 'human error' has become the handicap of human factors. Semantically, 'human error' and 'handicap' have multiple meanings that have taken different evolutionary paths. 'Human error' as used nowadays often implies causality and agency (even guilt) with reference to adverse events. While the terms may be used with good intent by some, the plaintiff cry "That's not what we mean!" cannot undo modern connotations.

Metaphorically, just as weights were used in handicap racing to weigh down or limit a horse, 'human error' has limited the appreciation and application of human factors. Many people focus on the so-called 'human factor', rather than socio-technical system interactions, which is the real focus of human factors. 'Human error' limits our understanding of safety, and the term is captured by the legal system and translated to carelessness, or worse.

Socially, as the term 'handicap' is potentially stigmatising of disabled

5- Train crash judge summons track safety managers, *Leader*, 10/09/13
 6- Spain train crash: human error over decades, not just seconds, *Guardian*, 25 July 2013
 7- Hollnagel, E. and Amalberti, R. (2001). *The Emperor's New Clothes, or whatever happened to "human error"?* Invited keynote presentation at 4th International Workshop on Human Error, Safety and System Development. Linköping, June 11–12, 2001.
 8- Dekker, S.W.A., (2006). *The field guide to understanding human error*. Ashgate.
 9- Don't call me handicapped! *BBC News*, 4 October, 2004.

'HUMAN ERROR'

The handicap of human factors, safety and justice (cont'd)

people or people with disabilities, the term 'human error' is stigmatising of people caught up in systems failures, even if some 'mitigating circumstances' (such as fatigue) are permitted.

Left with a 'human error'-shaped hole in my vocabulary several years ago, I found an alternative concept thanks to Erik Hollnagel: performance variability.

Perhaps most importantly, both terms imply deviation from 'normal'. In the case of 'human error', for complex tasks such as air traffic control there is often no normal or ideal that can be precisely and exactly described (see Hollnagel, 2009). As is visible after only a few hours observing and talking to controllers, what controllers actually do depends on many things. These include traffic demand and the context and conditions, such as staffing in the ops room, who you are working with, the state of the procedures, the shift system, and the equipment in and out of the ops room. In fact, work by Chris Johnson on degraded modes of operation¹⁰ suggests

that 'normal operation' is in fact abnormality; we get used to operating in various degraded modes of operation. This means that people must continuously adapt and respond to the context and work demands. What can be expected is variability and diversity, not deviation from a standard.

Words shape worlds

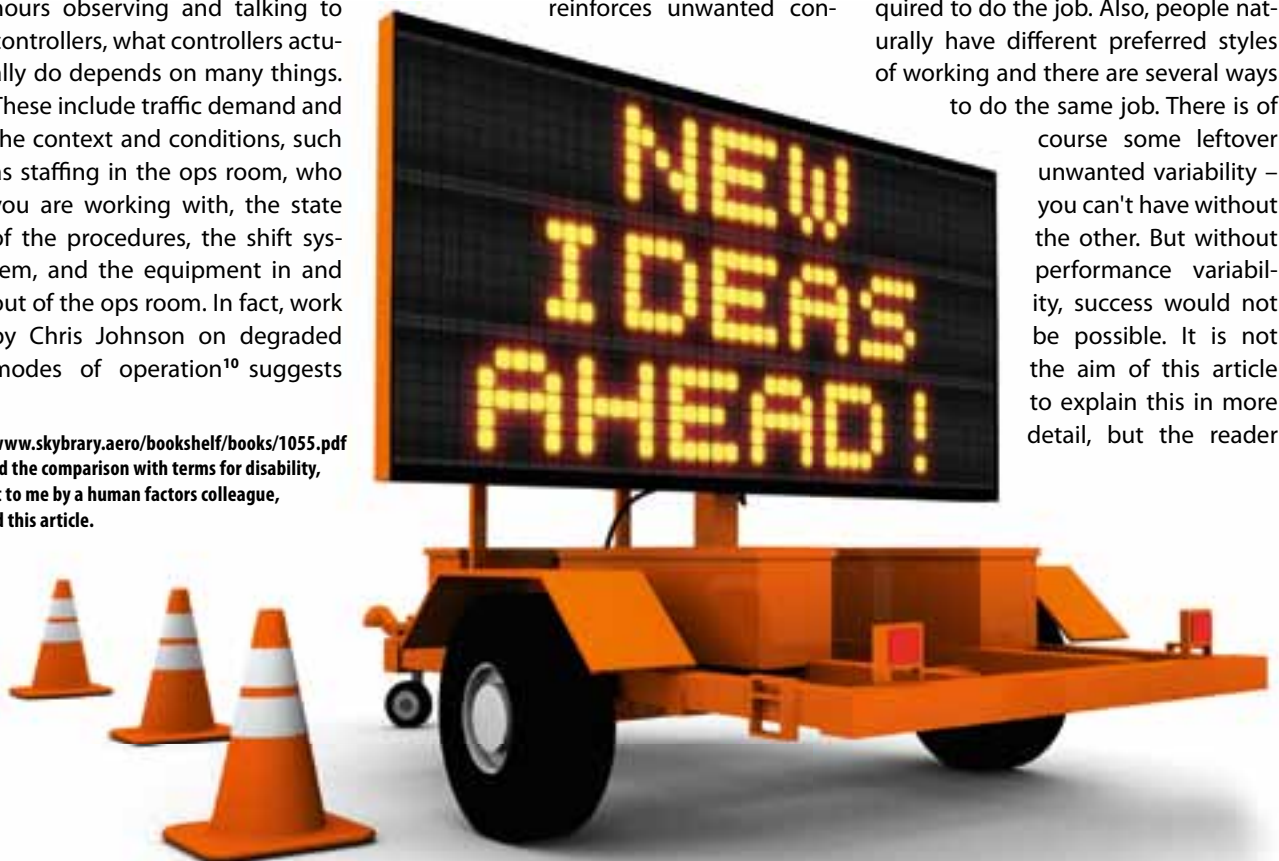
Does it all matter, if we still use the term 'human error' when we know what we mean? Do we risk falling onto a euphemism treadmill, skipping from one term to the next?¹¹ The argument presented here is that it does matter. Our language affects the way we view the world and how we approach problems. Even if we know what we mean when we talk about 'human error', and even if it does seem to fit our everyday slip-ups and blunders in life, the term reinforces unwanted con-

notations, especially when we are talking about complex systems. While we cannot put the genie of human error back in the bottle, we can use a new vocabulary to create a new understanding.

Left with a 'human error'-shaped hole in my vocabulary several years ago, I found an alternative concept thanks to Erik Hollnagel: performance variability. This is not simply a replacement term but a new way of thinking that acknowledges the reality of how systems really work. Performance variability, both at an individual level and at a system or organisational level, is both normal and necessary, and it is mostly deliberate. What controllers actually do varies, because it has to. We have to make efficiency-thoroughness trade-offs, as well as other tradeoffs. This flexibility is why humans are required to do the job. Also, people naturally have different preferred styles of working and there are several ways to do the same job. There is of

course some leftover unwanted variability – you can't have without the other. But without performance variability, success would not be possible. It is not the aim of this article to explain this in more detail, but the reader

10- See <http://www.skybrary.aero/bookshelf/books/1055.pdf>
11- This risk, and the comparison with terms for disability, was pointed out to me by a human factors colleague, which prompted this article.



HERE IS THE NEWS

is encouraged to explore this further (see Hollnagel, 2009).

More generally, if we wish to understand and improve how systems really work, we need to enrich our vocabulary with systems concepts, and use these in preference of simplistic notions of failure directed at sharp-end operators. This is not to say that people are not responsible for their actions – of course they are. But normal variability in human performance is not 'recklessness', and labeling either as 'human error' is not helpful.

It's time to evolve ideas

'Human error' has long outlived its usefulness in systems safety, and has now become the handicap of human factors, safety and justice. We can't expect society to change the way it thinks and talks about systems and safety if we continue in the same old way. It's time to evolve ideas and think in systems, but for that to happen, our language must change. Overcoming 'human error' in our language is the first hurdle. **S**

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Rackheath gas blast caused by human error, report finds – "An explosion that badly damaged a Norfolk industrial estate was caused by a gas cylinder switched on in error, an investigation has found." BBC News, 20/09/12.

'Tiredness' & 'human error' led to wrong procedure, consultant tells medical inquiry – "The consultant at the centre of the Medical Council inquiry into the wrong operation being performed on a two and a half year old girl, has said "human error" and being "quite tired" led to him writing down the wrong procedure in the medical records." RTE, 18/09/12.

Experience on task in a just culture

by Captain Dirk DeWinter

Should we be more forgiving towards experienced pilots in a Just Culture? Many presentations in the Flight Safety Foundation Go Around Safety Forum hosted by EUROCONTROL earlier this year cited the inability to meet approach stabilisation criteria by the required height as one of the main reasons for go-around initiation.

There can be many “external” reasons for this such as unexpected shortcuts; runway changes or wind changes. Experienced pilots can often anticipate and mitigate these obstacles better than less experienced ones. Enhanced Crew Resource Management (CRM) techniques such as Threat and Error Management (TEM) have been particularly developed to assist less experienced pilots with their anticipation skills. The aviation industry tolerates the fact that inexperienced pilots tend to cause more go-arounds because they are expected to learn from the experience.

But experienced pilots can also be “caught out” and be unable to meet the stabilisation criteria at the required ‘gate’ height. Here personal pride may begin to play an important role. The experienced pilot may find it difficult to admit he’s been caught out and will often try every trick in the book to get stabilised and may even continue beyond the gate height because he believes that with his experience he can still put it right.

This problem often shows up in the content of air safety reports (ASRs) and in Operational Flight Data Monitoring (OFDM). Whilst inexperienced pilots often initiate more go-arounds, experienced pilots are frequently involved

in continuing unstable approaches and in resulting significant safety incidents.

Why do these experienced pilots act this way? Is it indeed because of personal pride as suggested above or because of “must-land-it-is” – trying to make the schedule and ‘doing the right thing’ for the interests of the Company? How should a Company that has committed to a just culture react to this non-compliance with the stabilised approach criteria? Should an experienced pilot be given more ‘credit’ than his inexperienced colleague?

All pilots learn from experience. While Captains may prompt their First Officer early in an approach when they sense it is not going the right way, I believe that there is little learning value in this. More learning value may be obtained when they execute a go-around and recognise why and where the approach became unstable. Even a short post-flight debrief could provide more useful information and pointers.

So what will the First Officer conclude when his experienced Captain continues to land from an unstable approach? The majority of approaches defined as unstable are followed by normal landings, although the safety margins are significantly reduced and

the industry consensus remains that a stable approach is a pre-requisite for a safe landing. What will this First Officer do the next time he finds himself flying an unstable approach?

Companies have tools such as OFDM, LOSA, line checks and recurrent simulator checks to verify that their Standard Operating Procedures (SOPs) are being complied with. However, the ‘role-model’ function of experienced Captains should not be underestimated. Their knowledge and experience should give them a better appreciation of the reason behind a safety-critical SOP such as adherence to stabilised approach criteria.

Just Culture is often described as an atmosphere of trust in which people are encouraged to provide essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour. A pilot who breaches a single significant SOP or displays a serial disre-

CHECK LIST

- experienced pilot
- approach stabilisation
- go-around initiation
- can avoid safety incidents
- 'role model'

guard for less significant examples of them as a deliberate act cannot expect immunity. However, if the deviation was neither premeditated nor intentional and would not have come to light except for a voluntary safety report by the pilot concerned, then a remedial training package is more likely to be appropriate than punishment.

While both experienced and less experienced pilots are equally protected under the just culture philosophy, I conclude that the aircraft commander, because not only his rank but his corresponding experience and function as a "role-model", has less right to plead unpremeditated or unintentional non-compliance with safety critical SOPs such as stabilised approach criteria. So in their case, the corrective measures should be focussed around training which will also make them better role model for more junior pilots. **S**



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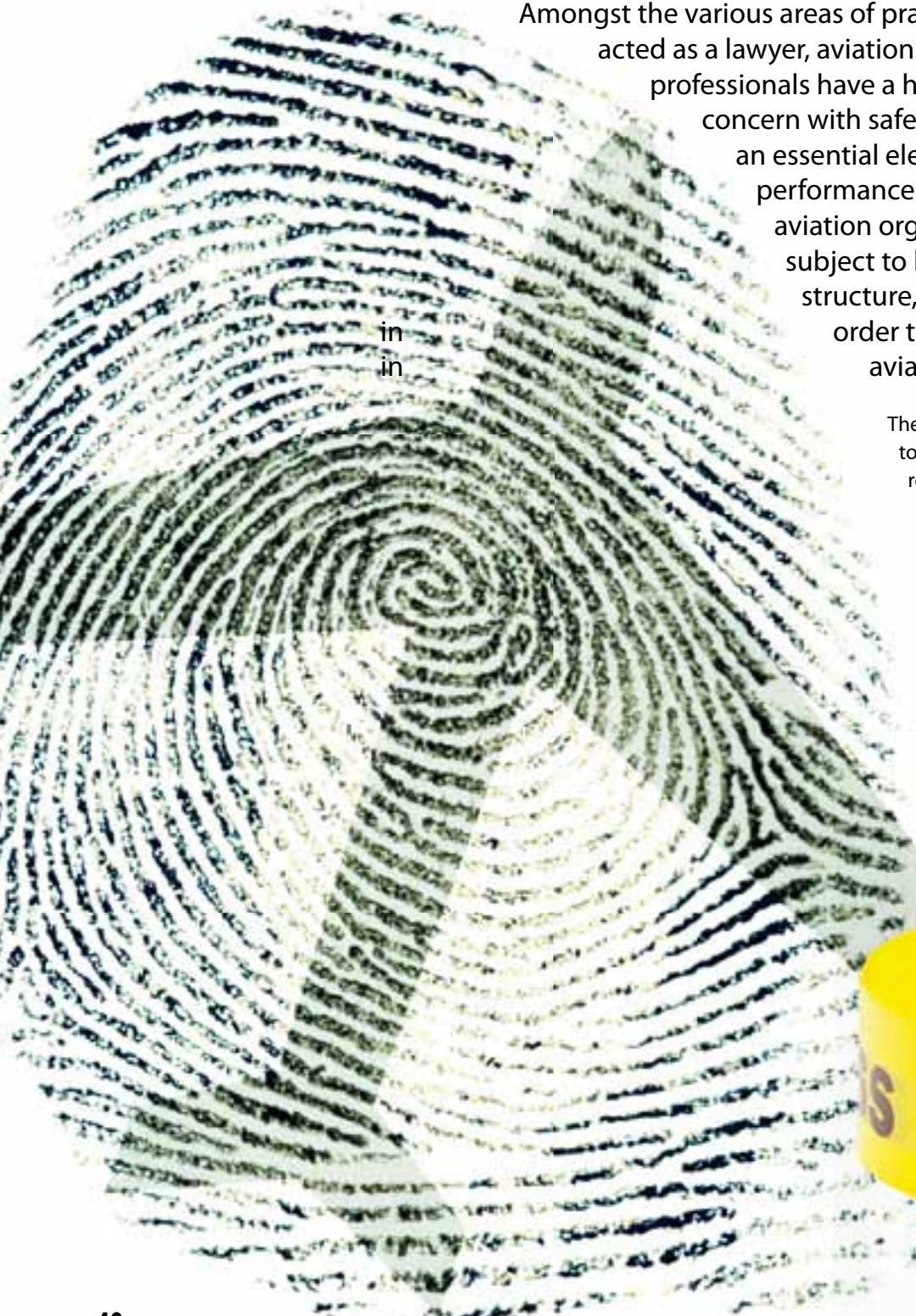
Just culture versus criminalization - moving forward

by **Jerónimo Coelho dos Santos**

Amongst the various areas of practice in which I have acted as a lawyer, aviation is the one where I believe professionals have a higher and more consistent concern with safety, which they consider an essential element for the proper performance of their activity. In fact, aviation organisations themselves are subject to legal criteria pertaining its structure, management and resources order to support operational safety aviation.

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These preliminary observations may help to understand the astonishment and even rejection of aviation professionals regarding the criminalisation of what they refer to as 'honest mistakes'. This individual and collective behaviour of aviation professionals should not be mistaken with the pursuit of a 'status of impunity'. Actually, aviation professionals accept and claim that unsafe acts resulting from gross negligence or intentional actions should be punished because the aviation industry cannot tolerate practices that seriously violate safety standards.



Aviation professionals have for a long time claimed that the law should clearly distinguish between a non-punishable level of activity in the form of 'error', from another level where unsafe acts should be punishable.

By not punishing the negligent acts of aviation professionals (the so-called 'honest mistakes') aviation safety is strengthened through the reinforcement of a positive culture based on an environment of trust, free reporting of safety occurrences, analysis and dissemination of 'lessons learned' for the benefit of safety.

Some professionals and others working in aviation take the view that the usual model of justice in which an offender is punished in order to avoid relapse (deterrence) and in order to show others that they must use due diligence to avoid suffering the consequences of their actions (general deterrence) is not appropriate to their industry.

They say that the proliferation of criminal investigations into the actions of aviation professionals reduces reports of occurrences and, therefore, lessens the chances of preventing future repetition of similar unsafe situations.

What matters is to work out how to achieve both safety and the rule of law at the same time. The problem can be considered in an interrogative manner:

1. **Could the Law accept that conduct which violates professional due diligence should not be punished?**
2. **If the answer is affirmative, where should the line between punishable and non-punishable acts be drawn?**
3. **Once this problem is solved, how should the line be defined? By law rules or through law enforcement?**
4. **Regardless of how the question is solved, who draws the line, i.e. who qualifies a specific conduct occurred as punishable or not punishable?**
5. **All these questions raise the most relevant issue – is it possible and desirable to establish a common legal framework at international level?**

Let's look at each of the points.

1 Criminal laws define intentional conduct by describing it. Additionally, some conduct of this type is also punished when the person acted with negligence. And within the latter, the law distinguishes between punishable and not-punishable conduct depending on the degree of negligence. If the law in all fields of human behaviour already drew lines between the type of conduct deserv-

ing and not deserving of punishment, nothing would prevent us from making the same distinction regarding the aviation professionals' breach of their duty of care.

2 This brings us to the second question: where to draw the line between punishable and non-punishable behavior. This is one of the most difficult questions to answer because violation of due diligence could endanger lives, limbs and property and, in extreme, can result in the actual loss of lives, personal injury and damage to property. Should



Just culture versus criminalization – moving forward (cont'd)

the answer to the question, 'where to draw the line' take into account the effects of the person's conduct or exclusively its context? It is possible to address the 'draw the line' issue at two levels in a criminal justice policy:

- **When the legislator is concerned with which outcomes are punishable.** The law could opt just to punish conducts that lead to injuries or damages, or the latter and harmless conducts that create danger to people or property. In some legal systems criminal law still punishes the creation of abstract danger (theoretical, not actual danger). In such cases the professional is punished without actually endangering people or property because the law selects the 'safety of aviation' itself as the value to be protected. It can be said that the law criminalises the conduct that creates the danger of endangering lives and property in the course of aviation.

- **When the legislator is concerned with which conducts are punishable.** In this case, the criminal law determines whether or not to take legal action according with the culpability of the person. Some crimes depend on the intention to inflict harm or cause damage whereas some others could be the effect of the breach of a duty of care or through the disregard of the rights or the safety of third parties, i.e. acting with negligence. Regarding negligence, it is still necessary to distinguish gross negligence from negligence. The solutions and legal concepts differ between States but some sort of definition of different degrees of culpability of conduct is always present.

The challenge for policymakers is, thus, to find the balance in achieving both public interests at stake: to ensure aviation safety and to punish those who commit a crime. One answer seems clear from the perspective of aviation professionals: punishment for the creation of danger without serious consequence should not occur. The creation of hazards to air navigation without endangering life, limb or property, severely compromises aviation safety yet, on the other hand only marginally satisfies the collective interest of punishing professionals who have failed their duty of care.

Decriminalisation can not be an adequate solution to crimes which cause actual dangerous consequences. Nevertheless, before action which leads to this is taken, the right balance between the public interests concerned, flight safety and criminal liability, should be determined by the context of the professional conduct rather than its outcome. In other words, we must decide whether to punish any conduct that violates due diligence

or whether all such violations must be punished, choosing, for example, not to punish those who acted negligently and punish those who acted with gross negligence and/or intentionally.

In my opinion, the issue can be addressed at three levels, that of the individual State, at a regional level or globally. At the individual level, action can be immediately taken at State level to promote the change of national criminal law in accordance with the most appropriate solution for the protection of individuals against danger and harm, with regard to civil air navigation and air transport development and reliability, which will not prejudice the increase of operational safety. Specifically, States should enact criminal provisions for aviation professionals, a more limited list of offences than apply generally so that they are at least excluded from prosecution for crimes of theoretical (abstract) danger whilst still being liable to prosecution when causing actual (concrete) danger and death/serious injury or major damage as a result of gross negligence or intentional disregard of the rights or the safety of others. A more comprehensive approach, regional or global, involves international organisations to compromise States to adjust their criminal law to common principles that safeguard the growth and safety of international civil aviation. This path would be the best way to enhance a positive and safe environment in international civil aviation, but the cultural roots of different legal systems and different levels of political and social development in the globe mean that such a solution would be difficult to implement. Nonetheless, at a regional level, where States share a common legal system and similar levels of political and social development, the acceptance of an obligation to harmonise criminal law may be less difficult to achieve.



Jerónimo Coelho dos Santos

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3 Law enforcement has, by definition, to observe the law. Within the range that the law permits, measures can be taken to limit the inquiries into the actions of aviation professionals with a view to their prosecution. For example, the use of instructions to the prosecutors, instructions which may have a greater or lesser extent according to the legal system involved. There will be more freedom to give instructions under common law legal systems and less under civil law systems. This process can at least create a more stable legal environment in each State but will not guarantee harmonisation internationally so the lack of confidence of aviation professionals and agents in the justice system at that level remains. So, the solution that best brings certainty and confidence in the system is the stipulation of criteria in the law and not by giving instructions to the judiciary.

4 In a particular situation, who will decide whether conduct is punishable or non punishable. In general, States give investigative power to the police and the decision on whether to charge people with an offence to Prosecutors. Assessing the conduct of aviation professionals when there is evidence that the conduct is punishable or when the outcome legally requires opening an investigation (e.g., if there are deaths) are powers that belong to police and to law officers.

Whilst the mere beginning of a criminal investigation may bring uncertainty and, consequently, have a negative effect on the just culture environment, it is also true that the decriminalisation of crimes of danger (at least crimes of abstract danger), and the strict punishment of gross negligence and intentional misconduct are scenarios



Just for laughs, let's consider basing your defence on that "mumbo jumbo" aviation law you spoke of...

that provide a high level of certainty for aviation professionals.

The grey area is the distinction between negligence and gross negligence, but most conducts do not offer doubts on whether the negligence is simple or gross. On the other hand, the concepts of negligence and gross negligence are not identical in all States and it is this difference which brings us to the last of the questions.

5 The difficulties of establishing an international legal framework are at two levels: the differences between criminal laws and the disparity in the application of criminal law. A standardisation implemented through international law requiring States to accept an external definition of what conduct should be criminalised is not accepted by States.

Instead, a process leading to the adoption of a Convention – under the auspices of ICAO – which sets up the principles governing the prosecution of the conduct of aviation professionals,

aimed at harmonizing national criminal laws would be difficult but in my view achievable.

Such a solution can also be developed at the regional level, but whilst the geographic restriction of the solution would be a breakthrough, it would also be insufficient given the eminent nature of international commercial air transport and of air navigation services.

In conclusion, the adoption of an international Convention whose main guidelines are the decriminalisation of danger and the exclusion of simple negligent acts of aviation professionals from liability to prosecution, would be, in my opinion, the best solution to increase just culture, aviation safety and justice. **5**



Why we need positive examples in our just culture

by Job Brügger

“Just Culture? Sure! Management checks whether the result was due to gross negligence or if it was an honest mistake. So then we either punish or let them off the hook.”

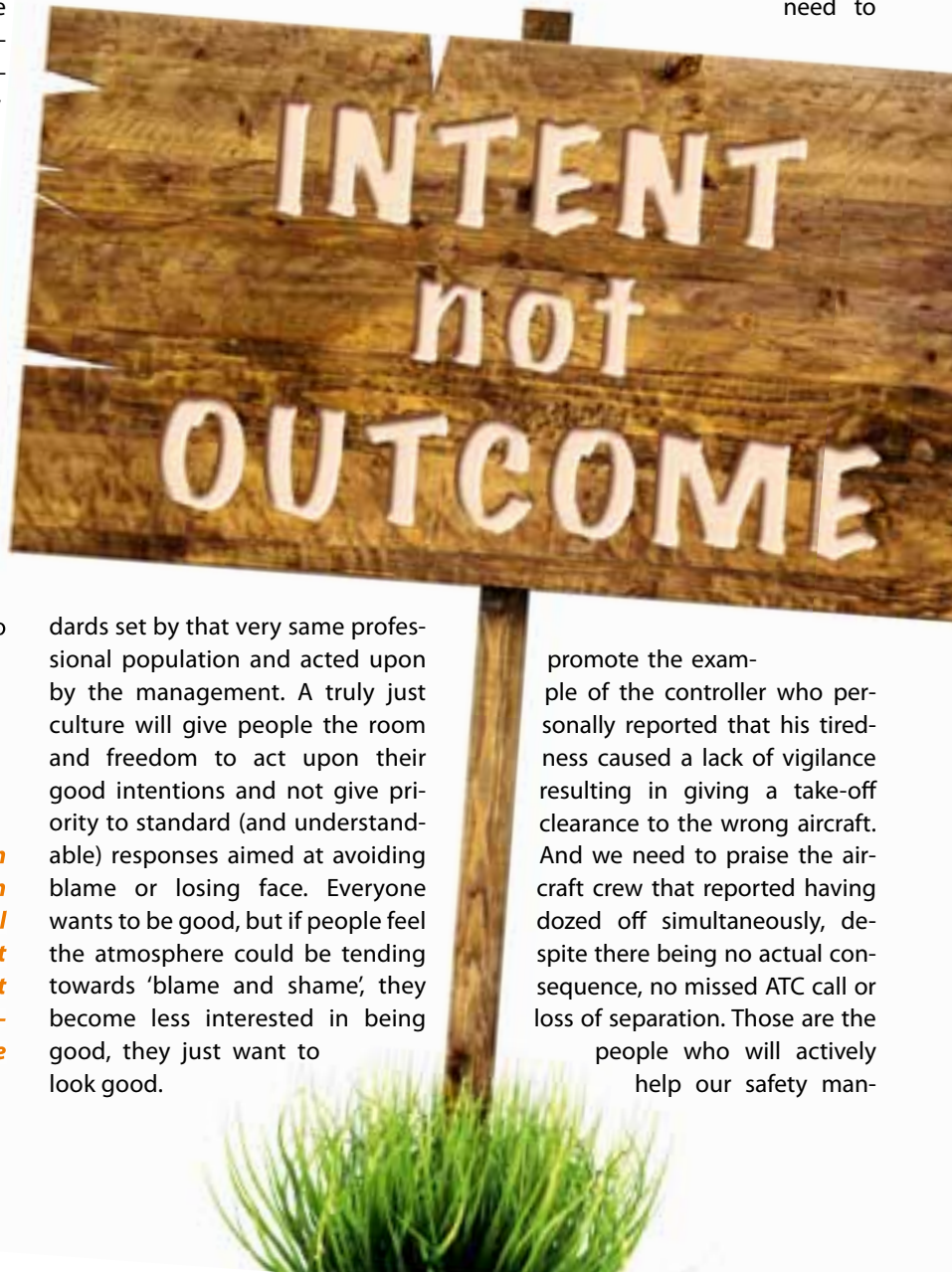
It is wrong guys. That is not how you create a just culture. Firstly, you should not look at the result, but rather at the action, even better the intent behind the action. Secondly, apparently the options are to punish or let them off the hook (so they were on the hook in the first place?), making very clear that the focus is on determining whether or not somebody is to blame. How ‘just’ would that feel to you? If you’re lucky, you’ll get a ‘get out of jail free’ card, if not, you’re busted? And thirdly, ‘management checks whether...’ is very questionable. Management is already holding all the trump cards, so now they also get to decide if you made an honest mistake or acted with gross negligence? How ‘just’ would that feel, especially if you knew that the relationship with your management was already tense, perhaps over a union conflict or a personal issue? It is all focussing on the negative side and that is what I want to correct with this short article.

It does not hurt to quote James Reason’s description of Just Culture:

An atmosphere of trust in which people are encouraged, and even rewarded, for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour. [J. Reason, 1997]

‘Just’ would be the culture if the professional population was able to perceive, even better: experience, that the entire range of behaviour of professionals would be assessed fairly, based on stan-

Thus we need to have examples of people demonstrating the desired behaviour. We need to commend the controller who admitted to having made a mistake, causing a conflict between two aircraft. We need to



dards set by that very same professional population and acted upon by the management. A truly just culture will give people the room and freedom to act upon their good intentions and not give priority to standard (and understandable) responses aimed at avoiding blame or losing face. Everyone wants to be good, but if people feel the atmosphere could be tending towards ‘blame and shame’, they become less interested in being good, they just want to look good.

promote the example of the controller who personally reported that his tiredness caused a lack of vigilance resulting in giving a take-off clearance to the wrong aircraft. And we need to praise the aircraft crew that reported having dozed off simultaneously, despite there being no actual consequence, no missed ATC call or loss of separation. Those are the people who will actively help our safety man-

I would bet that providing the right examples on the positive side is, in the long run, more effective than providing examples on the negative side.

agement system to work and provide the opportunity for improvements by reporting what happened and explaining why.

Taking that a step further, even more desirable would be to have professionals on your staff who are actively involved in spreading “the right stuff”. People that are not afraid to lose face over a silly error on their part and because they handle such a situation professionally, they achieve exactly the opposite: they gain credit and respect. Controllers that actively involve themselves in the safety management system and work in investigations, safety surveys or promotion activities. Telling the youngsters how easy it is to make a mistake and how to act upon it. Teachers are what we need! Better still: people that improve the very system you are applying to guarantee the safety in your organisation.

So you can see that the subject of Just Culture to me is not about where precisely this magic ‘line’ is drawn. There is no line. Every event is unique and there are various shades of colour (to avoid writing ‘grey’...). A Just Culture is about stimulating the whole workforce to grow in the direction of ‘better’ attitude and performance. The organisation itself must want to strive for continuous improvement and that automatically implies that the positive role models will be needed to provide the examples to follow. The graphic below tries to express eight different classes of human behaviour; that is about the number you can still manage without making it too complicated. No one person will ever fit precisely one of the boxes, but it gives you an excellent picture of where you should be heading. Of course there will be people that need correction and coaching. But I believe the organisation should provide role models for the workforce to adopt so that people really can perceive the ‘atmosphere of trust’ that is needed to grow the right culture.

I would bet that providing the right examples on the positive side is, in the long run, more effective than providing examples on the negative side. Only a very small portion of our professional community demonstrates (gross) negligence and we all agree we have no place for them. It is not worth much of your management time. The majority of the people intend to perform well. We need to give them the credit and status that fits their intentions and actions and give them the positive role-models that a good Just Culture needs. **S**



Job Brügger is

the safety manager of ATC The Netherlands (LVNL) and is particularly known for his activities in Just Culture developments. He was one of the first to demonstrate the detrimental effect of prosecution of air traffic controllers on incident reporting. In 2003 he re-created the CANSO Safety Standing Committee and chaired it for six years. He is currently leading the effort for the FAB Europe Central safety management activities. He also advises in the health care industry on safety matters with a particular focus on Just Culture and safety leadership.



Figure 1 – Eight different classes of behaviour (Brügger & Kools 2013 from www.safetyandjustice.eu)

A just culture in aviation – who is an expert?

by Dr Francis Schubert

For many years, the aviation community has been engaged in a passionate campaign in support of a "Just Culture", with limited success to date. Paradoxically, the failure to establish a genuine Just Culture can be partly blamed on the aviation community itself, which has occasionally seemed to be fighting the wrong battle. A recurring attitude has been to object to the very principle of judicial action against aviation professionals on the ground that criminal prosecution does not serve safety.

True as the last part of the argument may be, it misses the point: the obstacle which blocks the establishment of a Just Culture is not that aviation professionals may find themselves subject to criminal prosecution but the fact that they are often prosecuted for matters that do not appear to meet the conditions for such an action.

sufficient for a conviction. In addition to factual criteria a Court will consider the behavioural context, especially in respect of negligence. Demonstration of negligence is a requirement which exists in one form or another regardless of the judicial system in place. Legal text books typically define common negligence as "the failure to exercise the standard of care that a reasonable prudent man would have exercised in a similar situation." Negligence exists in various grades, ranging from simple to gross negligence – the latter being generally described as a conscious, voluntary act or omission in reckless disregard of a legal duty and the consequences for another party. In simple terms, deciding whether the condition of negligence is met in a particular case consists in evaluating whether the behaviour and actions of the individuals involved are acceptable under the specific circumstances of the case. The particular context and environment in which the event under investigation occurred must be taken into consideration. Negligence in respect of aviation safety occurrences must consequently be measured against the standard of care applied by a reasonable air traffic controller or a reasonable pilot, and not by a reasonable person unfamiliar with the realities of the aviation industry. A

behaviour which may seem questionable from the perspective of "the man in the street" will often be reasonably explained and justified, once all the practical elements of the aviation operational context are understood.

In those countries where the applicable legislation permits criminal prosecution not only in the case of an accident, but also in the event of an incident in which a significant risk to safety resulted, the existence of a real danger must often also be demonstrated. Here again, providing evidence of a dangerous situation is a delicate process which requires an extensive understanding and practical experience of the operational and technical reality of the aviation environment. A situation which may appear risky to the layman, will in fact often remain fully under the control of the individuals involved or at least within the margins of the safeguards available to prevent such situations degenerating into genuinely dangerous events. Courts have sometimes concluded that danger existed where aviation practitioners had failed to identify any real risk.

The definition of a Just Culture, which has been developed jointly with the aviation community, does not chal-

At the core of the Just Culture debate lies the subjective evaluation of key legal concepts, such as negligence and the existence or not of a concrete danger.

To qualify as a potential criminal offence, a safety occurrence requires the fulfilment of clearly-defined factual elements such as the death of or serious injury to people as the consequence of an accident. But the demonstration of these factual elements is not



Dr. Francis Schubert
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challenge the principle of criminal prosecution. A Just Culture is one in which "... front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated". In practice, the overwhelming majority of safety occurrences in aviation do not meet the conditions for gross negligence and few of them even meet the condition for simple negligence. In addition, only a relatively small number of incidents represent real danger. The tension between the judicial system and the aviation community arises from the fact that prosecution – and sometimes conviction – has occurred following events which in the view of aviation professionals did not justify that action. The purpose of a Just Culture in aviation cannot be extended into a judicial immunity for aviation professionals but it can help to ensure that only the tiny minority of cases which reasonable aviation professionals themselves accept are not tolerable are prosecuted.

The question of who draws the line between negligent and acceptable behaviours and between a dangerous and harmless situation has also been debated at length and the answer is clear: that authority belongs in the first instance to the prosecutor and ultimately to the Courts. The goal of

a Just Culture is not to transfer the task of evaluating these legal concepts to the aviation community. But judges and prosecutors will in most cases lack the knowledge and practical experience required to appreciate an aviation safety occurrence from the perspective of a reasonable aviation professional. In order to perform this task,



A just culture in aviation – who is an expert? (cont'd)

they need credible experts who have the ability to objectively evaluate the behaviour of aviation professionals. Of course, the judicial system already relies on aviation experts and these are usually recruited from within the aviation community. Paradoxically, some of the most devastating testimony against aviation professionals comes from their own peers. While the aviation community screams for a just culture, its representatives often provide many of the elements which will support a successful prosecution.

safety occurrences. Such experts need to understand both the practical reality of aviation and the principles that apply to the administration of justice. In respect of ATC, EUROCONTROL and the International Federation of Air Traffic Controllers Associations (IFATCA) have responded to this idea by setting up a training program run by representatives from the judicial system from various countries and aviation specialists. The ultimate objective of this joint initiative is to assemble a list of experts who are capable of provid-

tives from the judicial authorities of various countries. Such participation will certainly increase the ability of the judicial authorities concerned, if not to appreciate the details of an aviation safety occurrence, at least to integrate the need to reconcile the legal reading of a case with the practicalities of the aviation environment.

Second, at the moment the planned list of court experts has yet to be created. Obviously, attending a training program alone will not be sufficient to turn any “subject matter expert” into a more legally aware version of such an expert. The accomplishment of the just culture training program should be a requirement to join the list, but a credible selection process still needs to be developed and implemented. A broad selection panel could be established to achieve that. The participation of representatives from judicial authorities should be a prerequisite to guarantee that the selected candidates not only show a sound understanding of the practical features of the aviation industry, but also the ability to objectively deliver their input.

Finally, the proposed list of court experts remains informal. In order to acquire the level of credibility and authority needed to satisfy judicial authorities, the list of aviation experts will require a higher level of formality – some means of accreditation. One option could be for EUROCONTROL to become, on the basis of a formal decision of its Commission, the repository of the list of court experts. By doing that, the Member States of EUROCONTROL would be taking a major step towards the establishment of a Just Culture in aviation. **S**

Part of the solution to resolve the “just culture deadlock” could be the systematic training of Expert Witnesses...

Part of the tension arises from activity parallel to that which is the responsibility of the judicial system, at the level of the safety investigation which follows a safety occurrence. Since it is not the purpose of safety investigation reports to apportion legal blame and responsibility, these documents are often written from an operational and technical perspective, without any consideration to the conclusions that may derive from reading from the judicial system. Yet in some jurisdictions, the whole of these reports is admissible as evidence in support of criminal proceedings. In the process, prosecutors and the Courts often draw conclusions from these reports that were not necessarily intended by the experts who wrote them.

Part of the solution to resolve the “just culture deadlock” could be the systematic training of Expert Witnesses so that they better appreciate the potential differences between professional and legal readings of the facts surrounding

ing unbiased and balanced advice to the judicial authorities. The availability of such expertise can be valuable to a Court in reaching a decision to convict as well as in deciding how to sentence a convicted person following a criminal trial. But the involvement of such trained experts at the very first stages of a criminal investigation may, at least in civil law jurisdictions, be able to significantly contribute to the establishment of a Just Culture by helping to avoid unnecessary prosecutions.

This program has been successfully tested and has now been run several times with the attendance of a wide panel of participants. Lessons can now be drawn which should help raise the just culture concept to the next level of practical implementation.

First, benefits from the training program can already be anticipated from the fact that the courses were attended not only by aviation expert candidates, but also by representa-

Just culture in the real world: flight safety and the realities of society

by Paul Reuter

For years, the aviation industry has tried to establish a solid safety culture, which allows pilots, air traffic controllers and other aviation safety professionals to share information about errors or mishaps in an environment based on trust – one which neither entails blame nor leads to unjustified criminal prosecution.

Paul Reuter

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dered flow of safety information and the quest of society for accountability.

When we look at society – indeed at all societies and cultures throughout the ages – we see that the need for a set of rules, understandable to all, is a pre-condition for individuals to peacefully live together. One of those rules, deeply rooted in the consciousness of most Societies, is that no wrong-doing should go unpunished. For thousands of years, this system of rules and punishment has worked, more or less successfully, to keep us all “in check”.

With the advent of first the Renaissance and later the Industrial Revolution, European society became much more complex. With the 20th century advances in fields such as medicine, transportation, energy, etc. another phenomenon came to light – complexity. As a result, cause and effect in engineering, work processes, systems, machines and organisations became much less clearly definable.

From a human perspective, it slowly became clear that no matter how well-trained, well-skilled and motivated an individual may be, humans operating in highly complex and dynamic environments are bound to miss information, misinterpret data and make mistakes. If you add economic pressure and inadequate proce-

dures to the equation, then you get even greater opportunities for error. Finally, the human being itself is a delicate system which is thrown quickly off balance by stress, fatigue, sickness or other circumstances.

Despite this, if something goes wrong, the usual reaction of society will be “It's his/her fault. He/she should accept the consequences”. This “instinct” to attribute blame – while a perfectly understandable societal reaction – is extremely counterproductive for aviation.

Whilst those efforts are genuine, welcome and much needed for the benefit of safety, the aviation community has somehow failed to make its case clear. It has also failed to fully consider one of the basic assumptions of both society and individuals – that should something terrible happen, there “must” be someone who is responsible for it and “justice must be served”. A whole set of initiatives, among which the proposed new EU Occurrence Reporting Regulation currently being progressed, bring all that thinking and a whole range of reasonable arguments out in the open. This Regulation may finally be an opportunity to come closer to a workable solution, which will satisfy both the need of the aviation community for an unhin-





Just culture in the real world: flight safety and the realities of society (contd)



A fear of punishment will only put more pressure on safety professionals and could have the perverse effect of concealing information that could have been vital to protect others from making a mistake or recognising a problem.

They said in Orientation course that we'd spend a lot of time in dark, confined spaces... but I didn't imagine they meant this when I chose to be an Air Traffic Controller...

A fear of punishment will only put more pressure on safety professionals and could have the perverse effect of concealing information that could have been vital to protect others from making a mistake or recognising a problem. The fear of prosecution or punitive action at Company level after reporting an occurrence is still very much present today and it sometimes discourages aviation professionals from sharing details of the mishaps they have been involved in which would not otherwise have come to light. Anxiety that (social) media will single-handedly 'investigate' and pass or imply judgement on them for a mishap is even greater.

While most of us in the aviation community understand the dangers associated with blame and punishment, and have crafted safety strategies that try to counter those threats as much as possible, we sometimes see our best efforts thwarted when CVR recordings are leaked in the media or when pilots and air traffic controllers are prosecuted even before the reports of independent investigations are published. The influence of social media on accident investigations should also not be underestimated. People are by nature quick to judge and, with social media accessible to (almost) everyone, society is often provided with almost real-time commentary as events unfold

with videos, photographs and even a variety of theories on who got it wrong. In the fast-paced world of today, this can sometimes put unhelpful pressure on the necessity for a thorough investigation process.

But a focus on determining "what went wrong and how" without adequately examining the context in which it went wrong, may stem from the view that accident rates give a good indication of our safety performance. But since accidents today are so rare that I suggest that they should be seen as one-off events rather than meaningful indicators of safety. I do not mean that we should stop investigating them, just that we should pay even more attention to smaller everyday incidents which can be the precursors of an accident. We also need to know

1- The Prosecutor Expert Course's main objective is the formation and training of independent Air Traffic Management (ATM) or aviation experts available to advise prosecutors and judges in case of criminal investigations resulting from aviation incidents or accidents.

about people doing the right thing, where people went beyond the specifics of their training and used skill and judgement, to avoid unsafe outcomes. We also need to know about honest mistakes since, most of the time, there are some systemic issues related to these mistakes. Only this information will provide a reliable and complete view of where we are today in terms of safety performance. Yet, obtaining this information is only possible in an environment which “lives and breathes” Just Culture.

In my view it is paramount that society in general and the aviation industry

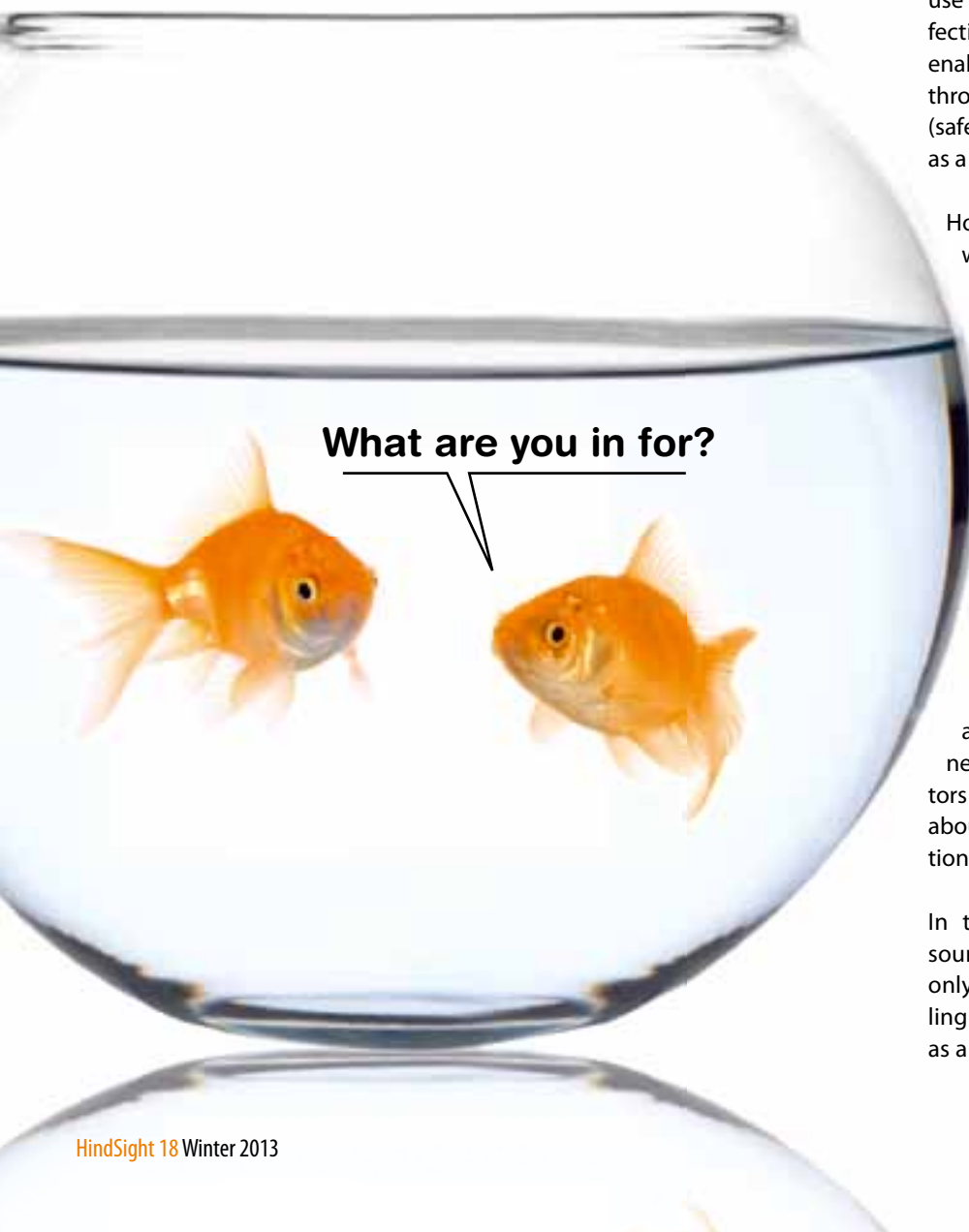
in particular understand the need to proactively communicate and share safety information and be able to rely on a certain level of protection to do that. The judicial system should not presume that we are circumventing our responsibilities, the media should not fear information blackout or censorship, the travelling public should not worry that we could “get away” with something without being held accountable for it...

That is why initiatives such as EUROCONTROL's Just Culture Task Force (JCTF) and the efforts undertaken by professional organisations to define

and implement Just Culture principles are so important. Initiatives such as the Prosecutor Expert Course¹ – where stakeholders, such as EUROCONTROL, IFATCA and ECA join forces and actively seek interaction with the Judiciary by providing aviation expertise – are also helpful in breaking down the walls between those stakeholders and judiciary. The involvement in this initiative of some judges and prosecutors across Europe shows that there is a genuine interest in gaining a better understanding of the aviation industry's safety systems. It appears that if enacted, the EU Regulation on Occurrence Reporting will provide better protection for reporters from inappropriate use of their safety information. Only an effective occurrence reporting scheme will enable us to achieve safety improvements through pro-active learning from any (safety) event, which will in turn allow us, as a society, to prevent future accidents.

However, we should acknowledge that we are only at the beginning of our struggle and that the road to a stronger Just Culture environment, within and outside aviation, is likely to be long and winding. We need to redouble our efforts and initiatives to get the message across: Just Culture is neither about immunity, nor about impunity, it's about safety. That's the message we should all have in mind when approaching other stakeholders. We expect the media to not attribute blame, but the media expects clear information from us, those customers affected by safety events and issues need explanations and safety regulators need clarifications. An open dialogue about our needs, fears and misconceptions is the way forward.

In the end, an environment built on sound Just Culture principles will not only benefit our industry, but the travelling public as well, and ultimately society as a whole. **5**





Just culture and American jurisprudence

by Tom Lintner and Tom Dunlap

The importance of operating a just culture in supporting safety occurrence reporting has sometimes been associated with the use of criminal prosecution after human error accidents and serious incidents in European aviation. In contrast, the United States does not often see criminal justice invoked in controversial circumstances after aviation accidents but it does have a unique culture in respect of the resolution of claims of corporate liability for the consequences of aviation accidents in the Civil Courts, where the penalties are primarily financial.

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Tom Dunlap

Whilst there are very significant differences between the two ways of dealing with liability, we believe that there are some interesting comparisons to be drawn between the mechanics of this system and the criminal prosecution of individuals after accidents or mishaps.

How a US Aircraft Parts Manufacturer minimizes legal liability

In the United States anyone can be sued almost any time for almost anything. While the claim may ultimately fail and at times even be frivolous, this does not remove the burden of legal fees incurred from defending a claim from a parts manufacturer or, indeed, any business. Contrary to the situation in many European countries, the United States allows 'contingent fees' which means a lawyer does not have to be paid by a claimant before filing their claim, but can instead legally take a proportion of the recovered amount (typically 33% to 40%). Further, the United States has the so-called "American Rule" for attorney's fees which means that, even if the claim is dismissed, as long as a low mini-

mum threshold of factual pleading is reached, the losing party does not generally owe the successful party's legal fees (unless there is a contract or statute to the contrary). This process is radically different to those seen in European legal systems and makes the bringing of claims much more likely.

When considering legal liability, there are several underlying questions to consider:

1. What legal and thus financial exposure to claims does a business or individual have?
2. What is the legal definition of a "defective" product?
3. How can a claim be defended or the risk of one being made reduced?

Planning for mitigation of legal liability is like drafting a will – it inevitably brings up issues that are not enjoyable, but nevertheless have to be confronted. Time, in either instance, is rarely on your side (despite the admonitions of the Rolling Stones that time in fact "is on [your] side"). Once people

die their heirs are hurt, angry and looking for someone to blame. The more pockets they can reach into to assuage their hurt and loss, the better they and their lawyers feel about a chance of recovery. From this the need to defend yourself and your business well before this happens arises.

In civil litigation the claimant must show that the defendant had a duty to them and that the defendant, as a result of their negligence, caused injury to the claimant. Quite simply, someone who is hurt – mentally, physically, or financially – must prove that it is more likely than not that the actions or omissions of another caused that hurt. Additionally, there are some instances where a parts manufacturer could be held strictly liable, meaning that a claimant need not prove actual negligence because such negligence is automatic as a matter of law. This makes parts manufacturing a particularly challenging arena in which to prepare for the eventuality of litigation.

Applying the foregoing, if a piece of equipment or part failed then, as a practical matter, the manufacturer is liable for any resultant injury unless they can prove that their part did not cause the injury, or that the part involved had been modified or improperly maintained, or that it had advised the user of the risks and limitations of the part which the user had then ignored.

It's important at this point to offer a perspective on 'honest mistakes' in this example. If for example, during the manufacture of a part, or a piece of equipment, there is admissible evidence that someone said, "you know, this might cause a problem," and they are ignored – or

worse, someone else says, "nah, impossible," that would be a potential example of gross negligence which would significantly increase the level of damages payable to a claimant.

Once an accident occurs and there is either injury or damage, it falls to the injured party to prove someone or something beyond their control caused the damage. This is the beginning of the "Blame Game."

Ironically, the aviation community has made significant contributions to enhancing the sophistication of the Blame Game with our focus on accident investigations where we claim – correctly – the goal of the investigation is to prevent a similar accident. Unfortunately, we conduct these investigations with a focus on finding who or what failed – because that's the easy part – and we have created a culture that actually supports the Blame Game mentality.

To truly enhance safety, which will entail finding out WHY something happened and WHY someone performed as they did – which is significantly more difficult than discovering WHAT happened – we need to alter our culture to move away from the Blame Game, while acknowledging our contribution in creating it, and further recognizing that playing the Blame Game is counter to the concepts of just culture.

Just culture and american jurisprudence (cont'd)

So let's assume there was an accident with an injury and damage to an aircraft. Let's further assume the claimant injured party believes that the accident was caused by a faulty or defective part which that they believe they were not adequately warned about.

To be successful with a legal action the injured party must:

- Prove negligence by the manufacturer or,
- Demonstrate that because there was a defect in the product or with the way it worked as part of a wider entire system, there is strict liability.

When we ask the question "is a product defective," we encounter examples of complexities of legal criteria. In the U.S. liability in the form of breach of duty is generally a matter of State law which, laws which while they vary, have in the past often imposed "strict product liability" on any product that was "unreasonably dangerous" for use by an ordinary consumer. Clearly, a standard that is anything but clear in an industry like aviation where the term "ordinary consumer" is hard to define and the nature of the business, soaring above the clouds in a metal container, is viewed by many as inherently risky.

This confusion in aviation – and a number of other areas – has led the majority of the US States to adopt a more rigorous standard for strict liability which requires that:

- a product "fails to perform as safely as an ordinary consumer would expect when it is used in an intended or reasonably foreseeable manner", and
- does so where the "risk associated with the design of the product outweigh the benefits of the design."



"I've had enough of your blame game... Next time ask Lady Fortune for advice..."

Whilst this new standard helps, there is still significant room for manoeuvre and therefore for legal argument.

Applying this standard in the parts manufacturing arena, the injured party – the claimant – must show that:

- The product/part was defective when it left the defendant's control;
- The product/part was used in the intended manner or in a reasonably foreseeable manner;
- The product/part caused the claimant's injury.

Furthermore, U.S. law generally imposes a duty on a manufacturer to warn an end user of risks. If the claimant believes that they were not warned about the risks of using a product or part or that it is "so complicated that it needs better instructions in order to use it safely" then the manufacturer

can be held liable for "failure to warn" in one of two ways, by failing to provide one or both of:

- **General instructions** like operating limits, weight and CG limits, etc.
- **Specific warnings of danger** like emergency procedures, placards in a cockpit, warning labels on equipment, etc.

While representing a tiny fraction of the issues involved in a U.S. civil litigation case, the reader can immediately see how the stage is set to focus on "who did it" and how "they" failed and what must be done to "correct and compensate" for the resulting damage.

While the prospects of litigation are daunting, frightening and, like death and taxes, perhaps ultimately unavoidable, an organisation can mitigate its risk and ultimate financial exposure by

being proactive. We propose that proactive legal review of operational procedures, regulatory compliance and internal quality assurance are the keys to promoting a safety culture and just culture, before an event occurs.


To mitigate the risk of civil litigation in the U.S. we suggest that organisations do the following:

Perform an initial exposure, liability and operational awareness assessment with a qualified U.S. attorney and aviation safety organisation to ensure your aviation business:

- Reports malfunctions, failures or defects in their products internally and to the proper authorities on a timely basis;
- Makes required design changes to preclude unsafe conditions and correct non-compliance when found;
- Complies with state, Federal and other operational audit requirements;
- Develops and maintains a "Continuing Operational Safety Plan";
- Maintains all original certification information, including computation and testing data;
- Strictly observes all corporate legal formalities, including annual meetings, books & records requirements and financial reporting;
- Reviews and audits internal disclaimers and contracts annually to keep up with changes in the law;
- Runs a tight ship.

We invite the reader to see similarities between these suggestions for parts manufacturers and the practices needed in any aviation business in respect of

safety management and risk mitigation.

Just Culture, like Safety Culture, is seemingly common sense but it nevertheless often clashes with the all too biased human tendency to fail to prepare in advance and instead to deal with avoiding responsibility and accountability after the fact. Ultimately, successful implementation of just culture requires a behavioural foundation – and the acceptance of responsibility – before an accident occurs. Just culture arguments offered after-the-fact will only appear defensive and be counter-productive to the overall goal of a balanced approach. It can be done but "The longest journey begins with a single step." 





Getting the benefit from just culture – Still some way to go...

by Ian Weston

In June 1972, a Hawker Siddeley Trident aircraft, G-ARPI, crashed very shortly after take-off from London's Heathrow airport.

Whilst the accident killed nobody on the ground, all 118 occupants were fatally injured and the aircraft was destroyed. A detailed investigation found that the crash occurred after the aircraft had entered a stall from which recovery was impossible following an inappropriate crew response to an inappropriate crew-initiated change of wing configuration. During the investigation, one of the things that became apparent was that full disclosure of related incidents on the Trident fleet had not occurred and where it had, full use had not been made of them.

The investigation into the crash led to a number of recommendations, the most notable of which was that cockpit voice recorders be required on all British registered aircraft with a maximum operating weight of more than 27000kg. However, it became apparent to the newly established UK Civil Aviation Authority that as the responsible safety regulator, they had no automatic awareness of safety occurrences unless they were deemed serious enough to warrant an independent investigation in accordance with ICAO Annex 13 or were reported as a mid air collision risk. It was therefore decided that there should be requirement for all specified safety events to be reported to the Authority by the individuals involved and the Mandatory Occurrence Reporting (MOR) Scheme was launched in 1976.

Reporters were given the assurance that the prime aim of the Scheme was the advancement of flight safety and that, except in cases of gross negligence, the CAA would not institute proceedings in respect of unpremeditated or inadvertent breaches of the law that had come to its attention only because they had been reported under the Scheme. The CAA also made it clear to employers that, except in cases where action was needed in order to maintain flight safety, or in circumstances that could be considered to exhibit gross negligence, they would expect employers to refrain from disciplinary or punitive action which might inhibit reporting. The MOR Scheme has been refined and reinforced over the years and now incorporates the requirements of the EU Directive 2003/42/EC on occurrence reporting in civil aviation. The success of the Scheme can be gauged by the fact that the occurrence database now holds details of over 250,000 incidents and updates are regularly passed to the ECCAIRS project. The CAA continues to stand by its original assurances, now reinforced by statute, relating to unpremeditated or inadvertent breaches of the law.

The concept of what is now referred to as "Just Culture," which the MOR Scheme embraces does, however, cause problems. EUROCONTROL's definition of Just Culture (A culture in which front line operators are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.) is widely accepted across the aviation spectrum but in the UK, for

example, those who breaches any civil aviation safety regulations can be prosecuted under the criminal law. Whilst most of the civil aviation community can see the benefits and, in some cases demand that aviation professionals are not subject to criminal sanction, others, especially those who have either been bereaved or injured as a result of an aircraft accident, may take a different view. Certainly, the civil aviation community cannot consider itself to be above the law and, therefore, a careful and considered approach needs to be adopted to allow Just Culture to play its part. Nevertheless, even once established, care needs to be constantly applied as it only takes one event for trust that has been built up over the years to be undermined.

In England and Wales, criminal prosecutions are only undertaken after reference to the Code for Crown Prosecutors. This document gives guidance and advice to prosecutors as to where a prosecution may or may not, be appropriate and it has never been the case that sufficient evidence alone has been sufficient grounds for suspected criminal offences to be the subject of prosecution.

The benefits of a Just Culture would seem to be common sense to an industry such as civil aviation that has an enviable safety record. Nevertheless, not only are there some disbelievers in our industry but there is a greater reluctance to accept the concept in the wider world. In order to gain a wider acceptance, evidence of the benefits is needed so that it can be presented to those yet to be convinced especially those in regulatory and judicial posi-

tions of power. Despite the amount of MOR data collected, such evidence is not necessarily easy to find and two serious incidents that occurred in the UK in the 1990s show that significant safety improvements still tend to follow independent investigations of serious incidents.

In June 1990, a British Airways BAC One Eleven aircraft suffered an explosive decompression whilst climbing through 17,000ft outbound from Birmingham UK when a flight deck wind screen failed.

Although the aircraft remained controllable the commander was sucked out of his seat and became wedged half inside and half outside the aircraft where he remained until the aircraft had landed some 22 minutes later. Demonstrating very considerable skill, the co-pilot made an emergency descent and diverted to an aerodrome on the south coast of England. The accident investigation conducted by the UK Air Accidents Investigation Branch (AAIB) focused primarily on the airworthiness cause of the event, it also noted that there had been shortcomings in the ATC service that was provided to the flight following the decompression and subsequent declaration of a "Mayday." The controller who had initially been providing that service had not given the co-pilot the help and assistance that would have been appropriate. During the subsequent interview of the controller he accepted that he had

been overwhelmed by the event and had felt unable to cope. This interview was given in the knowledge that the UK operated a Just Culture policy and the controller was able to provide a full and frank description of his thought processes and actions without fear of prosecution or punitive action. That a previously well thought of aviation professional could fall victim to serious failings during an emergency situation gave rise to serious concerns. The investigation found that for various reasons, the ANSP ATC training package approved by the CAA as Safety Regulator had not prepared the controller to deal with emergency situations and that this weakness had not been highlighted during his subsequent service. Therefore one of the eight safety recommendations made by the Investigation called for controller training in both the theoretical and practical handling of emergency situations during initial training and for it to be subsequently enhanced by regular continuation and refresher exercises and appropriate action followed.

The second incident occurred in February 1995 to a British Midland Airways Boeing B737 climbing out of East Midlands airport en route to the Mediterranean.

In this case the aircraft received indications of rapid loss of engine oil contents on both engines followed quickly by indications of low oil pressure on both engines. When the commander initially requested an immediate return



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before moving on to investigating air accidents and incidents and was later selected to join the UK CAA's Senior Management Group leading the Safety Investigation and Data Department which included responsibility for the MOR Scheme. A great supporter of Just Culture principles, he made full use of them when he later directed the CAA's public prosecutions department. Retiring in 2010, he now sits as a member of Eurocontrol's Just Culture Task Force and supports their work by assisting in various courses and seminars.

to his departure airfield, the controller, a trainee on the sector, granted the clearance as requested but pointed out that another suitable airfield was considerably closer. This was accepted by the commander and the flight then was given all necessary clearances, assistance and information and a safe landing was made nine minutes later. The controller's mentor chose not to intervene and reported later that "he was doing as good a job as I could have done." Once the aircraft was on the ground it was found that engineering work on the aircraft the previous evening had required the removal of the borescope plugs on both engines which had then not been replaced allowing almost all of the engine oil to escape. The AAIB Investigation Report noted that "ATC on all frequencies but particularly the initial London frequency had provided all the assistance that (the aircraft) but with no extraneous distractions" The controller had apparently received the continuation training that had been introduced as a result of the BAC One Eleven event only a few days before. It could be argued that the successful outcome of this potential disaster and the saving of well over 100 lives can be attributed to a great extent to the application of the principles of Just Culture. **SI**



Why is it necessary to criminalise negligent behavior?

by Sara Panelli and Massimo Scarabello

Approaching the complex topic of the relationship between incident or accident safety investigations and the justice system from the opposite standpoints of the professionals involved, the observer could easily reach the conclusion that the two domains live in parallel universes and that no communication between them is possible.

Sara Panelli

since 1996 prosecutor in Turin, dealing with negligent behavior causing disasters, conducting criminal investigations in several cases of aviation accident and incident, participating in the trial for examination and cross examination of witnesses, expert witnesses and accused persons.



If one considers the subject just from the point of view of aviation professionals, it is tempting to think that the justice system should not take any interest in aviation incidents or accidents, provided that nothing more than an “honest mistake” is involved in the process that led to that outcome.

To be intentionally provocative, let's think of a system where the State decides not to punish negligent behaviour at all. Is this a safer system because all the individuals involved are focused on safety and do not have to worry about the “legal” consequences of their conduct? Do we seriously believe that all the people who could be possibly involved in the causation of an event will act in a better (i.e.safer) way just because the applicable rules of conduct are not enforced by law? In other words, is it acceptable to society as a whole that some areas of human activity where misconduct could lead to disastrous consequences are not controlled by the law? The answers to these questions, in our view, are negative and the reason for this will be more easily understood if we try to go through the process of criminalising such non-intentional behaviour.

lation than why, in some cases, negligent conduct is considered criminal, even if the penalty is less severe because the offence is considered less severe. So we will look first at the fundamentals involved in criminalising negligence. When society becomes industrialised, a lot of practical benefits are achieved, but at some cost. We consider that reliance on technology and system complexity generate an increased risk of carelessness and thus the criminal law, through the legislative framework behind it, must decide whether it is necessary to adjust rules of conduct and the criminal response to negligent behavior in order to protect societal interests.

This is the reason why some argue that the role of criminalizing negligence is deterrence. This can be referred to specific deterrence (for the individual who committed the crime) or general deterrence (to serve as an example to others). Critics have argued that deterrence is useful in the case of willful conduct but not for negligent behavior. The subject in the latter case is not aware of the consequences of their conduct and so he cannot be persuaded by the punishment of others not to do what he thinks it is not harmful. But it is generally accepted that punishing someone's misbehavior encourages external conformity to a rule. Thus, punishing careless conduct will

Massimo Scarabello

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After the degree in Law, he wrote some articles in Criminal Procedure and worked as a volunteer assistant in Criminal Procedure at the University of Genova. Very fond of aviation and aviation matters, he is actually attending at a course to get PPL.



It is definitely much easier to understand the reason why a State is interested in pursuing, and punishing, criminal behaviour such as willful vio-

reinforce the notion that society dislikes such conduct and will encourage people to take precautions to lessen the risks accompanying inadvertent behavior.

However, the point at issue is "must all negligent conducts be punished?" When does the State pull the trigger of a criminal prosecution against someone? It is up to the legislative system in place to guide the determination of this point. Some systems require gross negligence, others permit punishment for ordinary negligence whenever such conduct harms or prejudices substantial and primary interests. A fundamental role may be played in such cases by interpretations given by the Judiciary. In the Italian system, for example, different types of negligence are defined based on the state of mind of a person in respect of their awareness of the consequences of their action – 'mens rea' in legal language. If a person was inadvertently careless in doing something and didn't comply with generic or specific rules appropriate to the matter involved, there is the simplest type of negligence. What if a person could envisage and predict the consequences of their behavior? They still do not want that event to occur, but they act nevertheless, because they are sure they will be able to avoid the harmful outcome. This behavior is punished more severely. And when a person acts carelessly and is aware that a harmful outcome may occur as a consequence of their action, it is considered willful conduct.

This said, it's time to examine the system of procedural rules that, in Italy, may lead to a conviction and punishment in negligence cases. What is the Italian legal framework with regard to



"accidents" and "serious incidents"? A Public Prosecutor may be faced with two scenarios:

■ **An accident with victims and/ or injured people**

In this case our law contemplates the crime of manslaughter (Article 589 of the Criminal Code punishable with a sentence of 6 months to 5 years imprisonment, increased up to three times in the case of death of several people) and culpable injuries (Article 590 *ibid* punishable with an alternative sentence or up to three months imprisonment or of a fine, excepted the case of serious injuries punishable with a heavier penalty).

■ **An accident without victims or injured people, but nevertheless endangering public safety¹**

In this case, our law contemplates the crime of culpable aviation disaster (Art. 449 para. 2 *ibid*, punishable with a sentence of 2 to 10 years imprisonment).

If a crash causes the death of the passengers and also endangers public safety, for example, because it overflies a populated area and crashes there, manslaughter and disaster charges will be brought concurrently.

Even though these may be negligent crimes, because the Italian State has established significant penalties – albeit to be precisely determined by the Court taking into account the facts of a case – there is no option for a prosecutor but to open a case and investigate.

The Italian system is based upon the principle of mandatory prosecution whenever there is evidence of crime. Thus, the prosecutor is obliged to investigate any case where they become aware that a crime may have been committed, there is no discretion. And as soon as possible, the names of those suspected of committing the crime to be investigated will be recorded. The purpose of the investigation is to look

¹ for example, because the crash takes place near a town or a village

Why is it necessary to criminalise negligent behavior? (cont'd)

for evidence of a crime and to seek who is responsible for that. In brief, given that a crime is comprised of an objective element which usually involves three components – conduct, event and causality and a subjective element which refers to a determination of willful conduct or negligence, the prosecutor will have to search for evidence of each of these elements in order to validate the existence of the crime.

If take the case of an aircraft crash resulting in the death or injury of passengers, the death and injuries constitute the event of the crime of manslaughter or injuries. First of all, the investigation will focus on ascertaining the causes of the death in order to understand what has happened. It is often the case that the prosecutor will requires an autopsy on each of the victims. Such a procedure may establish useful details not only about the cause of death, but about how the accident/incident occurred. For instance, it may emerge that the passengers and the pilot became aware of a problem prior to the crash of the aircraft because the autopsy reveals fractures in their limbs caused because they threw out of the aircraft in a desperate attempt to save themselves. The autopsy may also reveal the weight of the bodies, which along with that of the victims equipment (e.g., ski equipment in case of heli-skiing activities) can support the safety investigation by helping to understand if the maximum transportable weight had been exceeded or if there was an improper weight and balance as a result of the loading of the aircraft. We believe that it is therefore clear how the criminal investigation can provide useful information to help reconstruct the accident and consequently, the safety investigation could benefit from it. The cooperation between judicial and safety investigations could and should enrich both the relevant areas of competence.

Usually, the prosecutor does not have the technical skills to reconstruct what led to the crash of an aircraft. He will therefore appoint and rely on experts to carry out all necessary examinations and analysis.

Once the facts of the event are known, the prosecutor will have to identify the dynamics of the accident in order to understand the nature of the conduct which has caused the crash of the aircraft. In order to do that, they will first need to examine the various different components of the wreckage. Both for the prosecutor and for the safety investigator, it is fundamental to ensure

that there is no interference with the site of the accident so as to preserve relevant evidence and control any access to it.

The prosecutor may therefore seize, as evidence, the area and the wreckage, in order to proceed to recover its components and understand the causes of the event. This seizure to prevent tampering with the site and aircraft components, is useful also to the safety enquiry when they do not (as in Italy) have their own powers of accident site control.

Usually, the prosecutor does not have the technical skills to reconstruct what led to the crash of an aircraft. He will therefore appoint and rely on experts to carry out all necessary examinations and analysis. In accordance with EU Regulation No. 996/2010, appropriate exchange of information shall occur between the judicial and the safety authority during the entire period during which Court-appointed experts are involved, in order to ensure joint participate in the examination of the parts of the aircraft. We believe that





the exchange of information and opinions between experts will lead to more reliable conclusions about the dynamics of an occurrence and the identification of the type of behaviour which has given rise to it so that the judicial authority can make a proper assessment of the subjective element – in the aviation domain, the extent of culpability

An analysis of Article 12 of EU Regulation No. 996/2010, discloses not only the need for the "coordination" of investigations as set out in its title, but also an invitation to "co-operate". Indeed, in the third paragraph of the article, it is stated that "Member States shall ensure that safety investigation authorities, on the one hand, and other authorities likely to be involved in the activities related to the safety investigation, such as the judicial, civil aviation, search and rescue authorities, on the other hand, cooperate with each other through advance arrangements". Cooperation is certainly easier to achieve when both authorities understand the complexity of the matter and the mutual implications of their work.

Therefore, notwithstanding the use of appointed experts, it will certainly be useful to inform and train members of the judiciary in the technical aspects

of the aviation domain, so that when dealing with a plane crash case, they are aware how to engage with other investigation activity. Similarly, we consider that those involved in aviation could benefit from knowing the approach used in any judicial system they might encounter after an aircraft accident. On the one hand, this will help them understand when they could be held liable for certain events and on the other to be better prepared, if necessary, to become experts acting in support of a prosecutor or a Court judge.

How advantageous is this exchange of information can be demonstrated by the conclusions from recent Just Culture seminars, where the two specialist areas, aviation and the judiciary, had the opportunity to compare their points of view. The joint conclusions were that:

- 1) On the one hand, it is not possible to think that Just Culture grants a kind of immunity from criminal investigation to aviation professionals;
- 2) On the other hand, given that the activity in the aviation field is extremely complex, the judiciary must be very careful in its evaluations.

These conclusions were reached following a debate about a specific case (Uberlingen) where, from a criminal point of view, it emerged that rather than a failure of front line operators to deliver on their responsibilities, it was shortcomings in the organisational system which were to blame and therefore liability lay with the management.

In the end, whilst all these technicalities may clarify 'how' we – the judiciary – work and possibly interact with the aviation domain, they do not clarify 'why'. It is perhaps time to stop being too focused in our own domain and begin considering the common interest, the one that derives directly from the origin of the modern society. In doing so, let's try to look at the two systems as means to pursue the same goal, which is a safety and a protective context, where all those involved, not only those who undertake professional duties but ordinary people who are subject to the behaviour of others, can rely on professionalism and be sure that if something goes wrong, they are not left alone and that the State, with the same, required, professionalism of those in charge of the investigations, will carry out all the necessary activities to find out if there is someone to blame for the unwanted result. 5



Justice and safety

by **A.C.(Fred) Bijlsma**

The aviation world is, by nature, international, dynamic and very sensitive to safety. The world of the prosecutor and the courts is, by nature, national, resistant to progressive change and very sensitive to the rule of law. These are two distinct worlds that seldom meet. Between these two worlds there is the world of Just Culture Task Force.

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The aviation world is, by nature, international, dynamic and very sensitive to safety. The world of the prosecutor and the courts is, by nature, national, resistant to progressive change and very sensitive to the rule of law. These are two distinct worlds that seldom meet. Between these two worlds there is the world of Just Culture Task Force. Just Culture addresses the often complicated relationship between the propagation of aviation safety and the administration of Justice at national level. No wonder that their interaction, or perhaps more correctly the lack of it, generates difficult and often passionate discussions with associated allegations on the 'criminalisation' of aviation.

This contribution addresses the prosecution part of the Just Culture equation. It describes the practice of the Dutch aviation prosecutor, the underlying criminal law elements and also expresses some views on the way forward towards a workable balance between safety and the administration of justice.

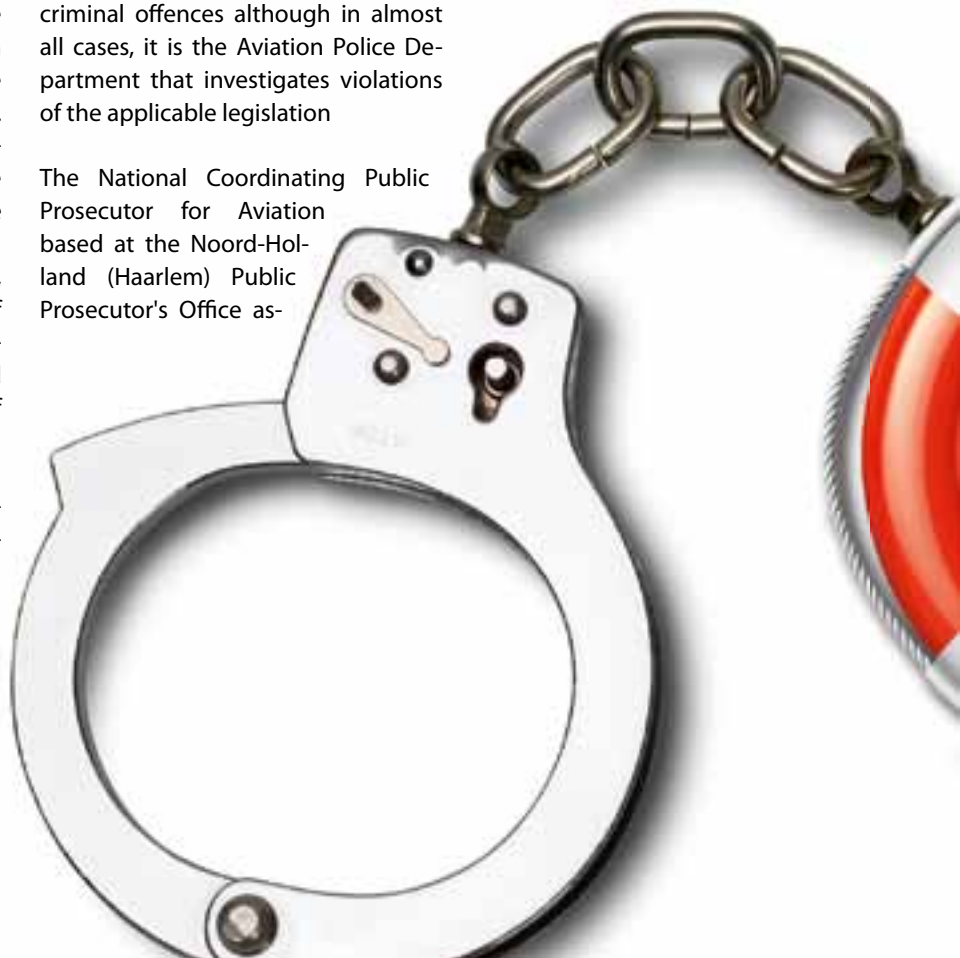
Prosecution of aviation cases in the Netherlands

In the Netherlands, the Aviation Division of the Inspectorate for the Living Environment and Transport (ILT) of the Ministry of Infrastructure and Environment and the Aviation Police Department of the National Police Services Agency are charged with the supervision of the compliance with the Aviation laws. All officials assigned by Section 141 of the [Dutch] Code of Criminal Procedure are, in principle, charged with the investigation of criminal offences although in almost all cases, it is the Aviation Police Department that investigates violations of the applicable legislation

The National Coordinating Public Prosecutor for Aviation based at the Noord-Holland (Haarlem) Public Prosecutor's Office as-

sesses all the civil aviation cases occurring in the Netherlands and advises the local Public Prosecution Service. In the exercise of that function, the aviation prosecutor takes into account the so-called "Instructions with regard to criminal investigation and prosecution in the event of the reporting of occurrences in civil aviation".

As from 1 January 2007, the legislative changes introduced by EC Directive 2003/42 on occurrence reporting have become effective. The objective of the



Directive was to contribute towards the improvement of aviation safety by a better process for the reporting, collecting, storing and disseminating critical information. This is presently the responsibility of the Occurrences Analysis Bureau of the Inspectorate for the Environment and Transport. The European Commission has since launched a proposal for a new Occurrence Reporting Regulation that is presently subject of discussion in the European Parliament and the Transport Council.

Another obvious player in the Netherlands related to this subject is the Dutch Safety Board. This Board is the independent investigator for a wide array of safety related events and was created in 2005, replacing different domain-specific investigation bodies. It should be noted that a basic assumption of the Dutch legislation is that a judicial investigation and an



I am not sure if I got it right: is this guy collecting data for Safety Management or the Prosecutor's Office??

investigation by the Dutch Safety Board into the same event are on an equal footing. The Public Prosecution Service and Dutch Safety Board have therefore concluded a cooperation protocol.

Legal framework

The original Penal Code dates back to 1881. The original Code of Penal Procedure dates back to 1921. Through the years both Codes have been amended and modernised. In addition, there is the Aviation Act and various regulations based thereon, both of which are subject to continuous change as necessary. International developments (ICAO, ECAC, EU, EASA etc.) often happen in quick succession so that the Dutch legislator can hardly keep up.

A Dutch Public Prosecutor is not only a public prosecutor, but has also a lot of competences which in other European countries may be vested in investigating magistrates or judges. When a Dutch Public Prosecutor applies those competences, they will

only be subject of judicial – and therefore independent – review afterwards.

In respect of aviation incidents, in the Netherlands – in principle – only accidents, serious incidents (outcomes which were almost-accidents), serious danger and systematic minor offences due to design or gross negligence are prosecuted. In any case, a criminal investigation is instituted in these situations.

'Gross negligence' means, according to Dutch law, a considerable degree of culpable imprudence (insufficient precautions, consciously taking an irresponsible risk, physical and/or psychological unsuitability). Accidents and serious incidents very often occur as the result of events that have – or might have – led to disastrous results. When mistakes are involved, they can often be labeled as 'honest' mistakes that would not qualify as criminal behaviour.

However a small, but highly visible, number of cases raise questions on the relevance and motives of some criminal prosecutions and court cases. The most important question in this



Justice and safety (cont'd)

respect is in my opinion “who will determine whether a mistake was made by a qualified professional acting in a responsible manner” and whether this behaviour clearly constituted gross negligence, willful conduct or criminal intent. Such a determination can only be made by a professional in the judiciary – a prosecutor and ultimately a court of law. It cannot be made by a chief pilot or a control room supervisor and these professionals have to realise that nobody can claim criminal immunity in any civilised country.

When it concerns civil aviation, these basic responsibilities, particularly those assigned to the Public Prosecution Service, may not just be set aside at the discretion of the Public Prosecutor. The “Instructions with regard to criminal investigation and prosecution in the event of the reporting of occurrences in civil aviation” is revised and re-published every 4 years by the Board of Procurators General. Such a directive can be seen as a demarcation of the “manoeuvring space” of the Prosecutor. Ultimately a judge or court may review whether a prosecutor has acted within the powers allocated to him or her.

Mutual Confidence and Understanding

After the implementation of the EU occurrence reporting requirements in the Netherlands Civil Aviation Act, the Ministry of Infrastructure and Environment started a what was termed a case study discussion group in which the aviation service providers (airline companies and air traffic control), the Aviation Police Department and the Public Prosecution Service participated. One of its goals was to promote mutual confidence as a basis for learning from and understanding each other

since confidence in each other's professionalism and independent role is not something natural. In other words, not only does the Public Prosecution Service accept an aviation sector that looks and judges critically, but the other way round, does the aviation sector accept the role of the Public Prosecution Service?

Initially, this discussion addressed – using artificial examples – collaboration and the trust. Since then, the group's participants have begun to discuss real incidents and debate whether they should be forwarded to the Public Prosecution Service. Up till the end of 2012, this had happened in three cases. In each case, a criminal investigation was initiated, but the investigations did not lead to a prosecution.

Successful working together and the reconciliation of the interests of safety and justice can be achieved by developing mutual trust. In a recent case the prosecution service decided not to act. In December 2012 two Boeing 747 were approaching Amsterdam Airport Schiphol. They approached each other one from the north, the other from the south at landing speed, at the same height. The newspapers headed ‘almost disaster’. The prosecution service did not act because we decided first to

look at the report from the Dutch Safety Board and secondly, because of our good relationship with Amsterdam Air Traffic Control and main carrier at Schiphol Airport who was the operator of one of the aircraft involved and could demonstrate their application of an effective Safety Management System.

In case of an aviation accident various bodies begin an examination of the facts:

- Those directly involved who wish to learn from their findings how to improve safety.
- The Dutch Safety Board which looks after public responsibility and may issue recommendations in order to improve safety.
- (only where appropriate) The Public Prosecution Service acting thereby repressively and also making public responsibility possible.

At this point, I would like to emphasise that the assistance of the expertise from the aviation police is indispensable for a prosecutor. This assistance of an expert group from the nationwide police department is of great value not only because of their knowledge of aviation technology, but also because of their knowledge of aviation regulations.



To that effect, a Cooperation Protocol has been agreed upon with the Dutch Safety Board. The cooperation agreements have also been laid down for the Public Prosecution Service in an instruction. The agreements in the cooperation protocol have been adopted by the Chairman of the Dutch Safety Board and the President of the Board of Procurators General. This protocol contains far reaching agreements about – for instance – the mutual sharing of data. Both the Instruction and the Protocol are public and may be consulted on various websites.

To Prosecute or Not to Prosecute

The Dutch Public Prosecution Service is not obliged to prosecute. This is the principle of expediency/opportunity. The basic assumption of the principle of expediency/opportunity is that a Public Prosecutor decides himself (independently) whether a punishable offence is being prosecuted (or not). The principle of expediency is an important feature of the Dutch law of criminal procedure.

It means that the Public Prosecution Service holds the discretionary power to decide not to prosecute a punishable offence if such is desirable. Ap-

plicable legislation stipulates that the Public Prosecution Service may decide not to prosecute "on grounds derived from the general interest". The Public Prosecution Service may for instance drop a case when the case is too insignificant, if reliance on a statutory defense probably will succeed, if there is insufficient evidence, if the interests of the suspect and/or (his) family would be harmed excessively by the prosecution. Dropping a case is called "dismissing a case" or "abandonment of prosecution" by the Public Prosecution Service.


The basic assumption of the principle of expediency/opportunity is that a Public Prosecutor decides himself (independently) whether a punishable offence is being prosecuted (or not).

Also in the Netherlands the public demand to blame someone is growing stronger. The Public Prosecution Service has to take that into consideration. In the aviation the Public Prosecution Service is more often confronted with a report. The Public Prosecution Service has to ensure that a decision is made, thereby taking into account the right of complaint of the person reporting. For, the decision of the Public Prosecution Service to drop charges may be submitted to the Court of Appeals, which may instruct the Public Prosecution Service to prosecute.

As opposed to the demand to blame someone there is the confidence in the professional and his organization. Safety incidents are not something airline companies and air traffic control are in need of. And no one will deny that a pilot, in any case the ones employed by the civil aviation and the air traffic controllers are professionals.

Concluding remarks

The keyword in my opinion is not the rules (legislation). A good basis for cooperation, or perhaps better – a basic attitude, if you want – is mutual confidence and communication. Central in this concept is 'transparency and honesty', even if you are in disagreement with each other. Because that does not necessarily means you can not work together. I am convinced that in this way, the Dutch Public Prosecution Service in the Netherland has contributed as a prosecuting body to the safety of civil aviation.

I hope that this contribution will be followed elsewhere in Europe, not just geographically, but in the end in the specific areas where the application of Just Culture may lead to an open communication and a balanced weighing of interests. Aviation with its international profile is the domain where both the safety and the 'administration of justice' may profit from the role of pioneer of particularly the Royal Kingdom and the Netherlands. Within the aforementioned boundaries I therefore expect that the Dutch Public Prosecution Service will continue to support the activities of EUROCONTROL Just Culture Taskforce within Europe and –maybe– also outside of Europe. 





Justice & safety: the art of making mistakes People sell washing machines – robots fly aeroplanes?

by Heli Koivu

In my country, there's a saying from which people get comfort at the moment of personal failure – "don't worry, even cruise liners sink!" I've never liked the phrase. If used, then how can you ever comfort the captain of the sunken liner?

Every morning us sleepy mortals hop into our cars, try not to forget our home keys, try to avoid hitting other motorists and struggle to navigate in traffic. We go on to work selling fridges, to teach or work in power plants, perform brain surgery, drive bullet trains, chemical tankers or pilot commercial aircraft in challenging weather conditions. Still, are we able and likely to make mistakes when at work?

There are many jobs in which making a mistake is not critical – nobody is hurt or killed or there are no

great economic or environmental losses. However, there are many occupations carrying a high risk potential and in which mistakes made by employees can have catastrophic results: loss of life, environmental damage or negative financial effects. To err is human. It is unfortunate that contrary to this saying some people still live under the misconception that the opposite is true.

Just culture & honest mistakes – valuable data source?

I offer a couple of definitions for the term "Just Culture":

"Atmosphere of trust in which people are encouraged (even rewarded) for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour" (James Reason 1997).

"A culture in which front line operators or others are not punished for actions, omissions or decisions taken by them that are commensurate with their experience and training, but where gross negligence, willful violations and destructive acts are not tolerated. This is important in aviation, because we know we can learn a lot from the so-called 'honest mistakes'" (Just Culture Guidance Material for Interfacing with the Judicial System, EUROCONTROL 2008).

Companies working according to just culture draw a distinct line between proper and improper behaviour. Employees working in commercial transport must pass strict tests to ensure that they have certain characteristics, for example the ability to work under pressure, to suit the job. Only after

sufficient and proper training are the chosen individuals ready to perform in their jobs. Even these trained and highly skilled professionals make mistakes in their work and at home. This is where the capability of an organisation to manage risks involving human factors comes in.

Does the organisation have the elements of a safety management system (SMS) not only documented but also in place and implemented in actual operations? Is the atmosphere such that mistakes are not hidden but openly and systematically reported, analysed and used as an information source for learning, mitigating measures and safety improvements? Easy-to-use occurrence reporting systems together with effective data recording systems (such as aircraft FDM-data when required) enable the effective safety analysis, risk assessment which facilitate continuous improvement of safe operation. Continuous improvement and SMS need also enough resources to succeed.

Employee competence consists of training, experience and attitude. The competence of an individual employee can sometimes be crucial barrier between an incident and an accident especially in the organisations with an underdeveloped safety culture and a



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poorly implemented SMS. Safety culture is after all an important safety net ensuring safe operation in any complex and changing operational environment. Nowadays cost and time pressures are increasing. There is multiple redundancy in aircraft and ATC technical systems. Is there enough back up in human operation and are the organisations supporting it?

The Media – a friend or a foe?

I once gave an interview in which I highlighted the need of confidentiality in occurrence reporting and the importance of these reports as the base of maintaining and improving flight safety. The article was well written up by the reporter apart from the unfortunate title which stated in huge bold letters "The hidden serious incidents in aviation".

Too often, the emotive response of the media and the general public to dramatic accidents with losses of life concentrates on a single employee and his or her actions instead of trying to build the big picture of real causal and contributing factors and the question why an accident occurred. One also sees articles about accidents where all the emphasis is placed on finding the guilty party in the case. The false logic in many occurrences is that punishing the employee that has made a mistake improves safety. It is also – incorrectly – thought, that by punishing someone for a honest mistake, future mishaps can be prevented and that it acts as a deterrent to other employees. It seems to be a soothing thought to assume

that there is a concrete reason for the accident and thus one can control safety in an absolute manner.

Unfortunately one can not simplify the concept of guilt. In some cases it might be applicable when the cause of the accident has been the gross negligence or intentional or unlawful conduct of an individual. Intentional violations are difficult to anticipate, although a well-functioning safety culture reveals undesirable attitudes or behaviour before the situation becomes more severe. In a just culture – based working environment, the employees have the courage to defend their point of view on safety issues in a conflict and also disagree with their superiors. Professionals in transport system normally intend to do their job well. In other words; who would want to be part in an accident?

CRM in the aeroplane cockpit – the way they work as a team – is an everyday example of the importance of the spirit of trust. Within good safety

culture, the crew works as a team, not as two or more individuals. A Captain and a Co-Pilot support each other and take responsibility for ensuring that flight management is achieved by real teamwork so that if one pilot is not at his/her usual peak performance, safe operation is not endangered. In a spirit of trust, positive feedback and advice or interventions to avoid mistakes are given and taken. On the contrary, the opposite atmosphere and/or too stiff a hierarchy in the cockpit, on the bridge of the cruise liner, in the ATC tower or in another safety critical working environment has too often been a causal or contributory factor to an accident or serious incident. Unwillingness to lose face or unwillingness to confront the more senior colleague can be surprisingly common especially in the surprise of a real situation. At its worst the consequences have been fatal.

Luckily, I also have lots of positive experiences with media. Media has an important role in influencing both good and bad attitudes. Conscientious

Justice & safety: the art of making mistakes

People sell washing machines – robots fly aeroplanes? (cont'd)

journalists have often written good and educational articles about general aviation, road traffic or boating accidents. In those articles they have highlighted safety issues as seat belts, life vests or dangers of drinking and driving.

Hospitals have turned to aviation in order to seek ways to reduce their unacceptably high rate of mis-treatment cases. Reporting mistakes, openness and learning from mistakes rather than allocating blame, as well as protective mechanisms like check lists have been tried with good results. This has also been recognised in the media. Even though the importance of just culture and open occurrence reporting have been understood in aviation, old habits and thought processes die hard in some organisations, cultures and public opinion. In addition seafaring is going through a great cultural change towards a more open way of learning from mistakes at the moment and needs occurrence data which right now is really scarce. The railways also have a lot of improvement to make in this area despite the fact that reporting on occurrences is mandated in railway regulations. The media could help bring about better operating cultures by highlighting these important themes.

Supporting reporting culture within the organisations

Safety costs, but accidents cost exponentially more. There is no real price tag for human suffering. In addition expensive investment is destroyed in accidents. Many companies wouldn't be able to cope with all the consequences of a major accident without bankruptcy. Even though companies have sometimes continued in business after an accident, the loss of image has been enormous.

But accidents can also happen to a so-called 'good' airline, shipping or railway company. Sometimes it all goes wrong even though the operator is fully compliant and has implemented SMS effectively. Still, there is no doubt that weakness in an SMS and poor safety culture often go hand in hand with a reduction in 'safety performance'.

I can not help wondering at the extent of denial in some companies; they would rather risk their fleets worth millions, almost like they'd be tossing a coin – to exaggerate just a little bit. Having evolved no safety culture or open communication, the management will surely not know what is actually going on and how their expensive equipment is being used. Sub-contracting or even chain-sub-contracting, contract workers and short term employment bring their own challenges to the culture of reporting. Companies must make an extra effort to get short term or contractor employees report on lack of safety or even mistakes they have made themselves. In those companies where occurrence reporting has become an integral part of the work culture employees willingly and actively document their mishaps after a duty period when mishap occurred.

Who is responsible for an accident?

How far does the responsibility extend when an accident takes place; where are the limits as to who is not responsible – do we need to lay blame? Ultimately an error made – sometimes when fatigued – by a pilot, air traffic controller, ship's captain or train driver may lead to an accident. Fatigue is one of the most difficult issues in occurrence reporting. For example, according to regulations, it is forbidden to fly when fatigued. However, every pilot

knows how high the threshold of declining a flight mission due to fatigue is. Sleeping problems, children being ill and other temporary reasons for insufficient sleep can cause fatigue. Everyone must decide for themselves on a case to case basis, if they are fit to fly. On the other hand, organisations should put effort on ways to control especially cumulative fatigue.

If an employee reports having been flying or working while tired when it is not allowed in the first place, there is an obvious problem. Authorities sometimes get occurrence reports where the reporter suggests that fatigue has been a partial reason for the incident. The regulators and the regulated need to keep to ensure that duty time limitations allow safe operation and sufficient rest periods.

When reporting fatigue, as well as other of kinds reports that may criticise the workings of their organisation, there is a danger that the organisation may consider the issue as contractual rather than safety. Here, careful attention must be given to finding out as objectively as possible whether a real safety issue exists. If, for instance, cumulative fatigue of poor training methods are considered to be a partial factor in an occurrence, but regulations have in principle been followed, then who is responsible? How far does the liability reach in the companies?

Another interesting question from the point of view of a regulator is FDM data. The benefits for improving flight safety in operators are indisputable but pilots in some airlines are still suspicious about its use. Regulations define the principles of the use of the data, but this does not guarantee results and, whilst it takes time to build the confidence of people about such



programmes and their link to occurrence reporting, it takes only one case of abuse to lose it. This applies also to the results of accident investigations, where the only goal is to improve safety.

Businesses exist to turn a profit. However, the profit should not be made without considering the risks involved. When costs are cut there is the danger that an increase in risk will prejudice safety. Businesses should aid the recognition of their risks with open internal dialogue to avoid the limits of safety limits being found via an accident. We also have to tolerate a degree of variation in personalities. It should also be accepted that an employee who criticises a company is not normally looking for trouble, rather he or she might have something important to offer about company practices and safety.

Gathering evidence for the functioning SMS or for prosecution?

EU Regulation (996/2010) on the investigation and prevention of accidents and incidents in civil aviation defines accident investigation data protection principles at the European Union level. In Finland's Safety Investigation Act (525/2011) Section 39 (Dissemination of confidential information) and section 40 define the protection both information and the persons involved with safety investigations.

At the moment there is important ongoing work on proposal for a Regulation of the European Parliament and of the Council on occurrence reporting in civil aviation. When ready, the new regulation will amend Regulation (EU) No 996/2010 and repeal Directive No

2003/42/EC on occurrence reporting in civil aviation, Commission Regulation (EC) No 1321/2007 (implementing rules for the integration into a central repository of information on civil aviation occurrences exchanged) and Commission Regulation (EC) No 1330/2007 (implementing rules for the occurrence data dissemination to interested parties). This work, when completed, will strengthen just culture principles and protection of the reporter and harmonise practices across all EASA – countries. In order to get good results, open dialogue about the proper use of data and just culture principles is essential. Also, adoption of just culture should be the same in different countries and in future in different transport sectors. In addition to protection of the individual reporter, there must be adequate protection of report databases in companies. Companies which have a well-functioning SMS and good reporting culture continuously gather a lot of safety data. Sometimes, after an accident has happened, the causal factors might have already been visible in the data. They might just be un-noticed or the intended mitigation hasn't delivered. Who is able to judge whether company should have seen the accident coming through a SMS? More and more national civil aviation authorities are beginning to conduct their oversight using a risk-based approach. They are

the ones who are continuously estimating companies' willingness and capability to manage their safety risks.

In Finland the principles of the European Regulations and Directives and of ICAO Annex 13 are implemented in Safety Investigation Act (525/2011) and Aviation Act (1194/2009). Just culture – principles and protection of reporters are mentioned, for example, in the Aviation Act, Section 134, Use of occurrence information:

"The authority must not take legal action based on an unplanned or involuntary infringement, of which the authority becomes aware only because a report is submitted in order to comply with the provisions of section 131, unless the matter involves non-compliance with obligations which can be considered as gross negligence, or involves acts punishable under the Penal Code. Operators shall not discriminate against employees who make reports concerning incidents of which they may be aware."

Similar text is currently being proposed for an amendment to the Finnish Railway Act.

The aviation authorities in Finland are taking just culture principles and the protection of safety information very seriously. This is not proving easy – too often the truth lies in a grey area and sometimes international co-operation is also necessary. But even if it is sometimes difficult the work must be done in Finland, in Europe and also globally. Only with open safety culture including just culture-based occurrence reporting and effective accident investigation has the aviation industry achieved such good results and made aviation the safest way to travel. So we can at least say that the whole aviation community is guilty of that. **S**

One of Europe's rare criminal prosecutions of controllers who were working an aircraft which became the subject of a fatal accident occurred in Italy in 2004. Many who are far from the State of Occurrence of this accident and the controversy surrounding the subsequent prosecution will be aware of it.

THE 2004 CAGLIARI ACCIDENT AND AFTERWARDS

The successful prosecution has been seen in Italy and elsewhere as a classic example of how difficult it can be in some countries for a 'just culture' to survive the need to balance safety improvement with the wider need of the judicial system to deliver an equitable interpretation of the law.

In this issue of Hindsight, we have first a summary of the circumstances which led to the accident and the findings and conclusions of the independent investigation into it carried out in accordance with the principles of Annex 13 by the agency responsible, the ANSV (Agenzia Nazionale per la Sicurezza del Volo). This is followed by a summary of the criminal prosecution of two military air traffic controllers which followed and by two commentaries on these prosecutions from an air traffic control perspective.

The accident investigation

by Captain Ed Pooley

This account summarises the findings, conclusions and safety recommendation of the ANSV Investigation carried out under ICAO Annex 13 principles with the sole objective of preventing accidents and incidents and specifically excluding any assessment of guilt and responsibility. It is based on the Final Report of the Agency which was published on 1 July 2009. This was not made available in English translation but a copy of the full report in Italian, an unofficial and partial translation into English and a longer English language summary than provided here may be found on SKYbrary¹

During the evening of 23 February 2004, a Cessna 550 Citation being operated out of Milan by Vienna-based air taxi company City-jet Luftfahrtgesellschaft and flown by a crew of two Austrian pilots was chartered at short notice for a medical mission. A donor heart for transplant had become available in Rome and a suitable recipient was initially located in Catania. During departure from Milan, the Catania patient became unavailable and the flight positioned instead to Cagliari Elmas. There, a three-man medical team was boarded and flown to Rome Ciampino in the early hours of the following day, where the aircraft landed at 0051Z. On arrival, the aircraft and crew were to await the return of medical team with the donor heart.

With the medical team and their 'cargo' on board, the flight departed Ciampino at 0400Z. The flight proceeded uneventfully in good weather conditions and shortly after the aircraft had been cleared to descend to FL 090, it was transferred to Cagliari APP, which passed the destination weather and runway in use – 32. Shortly afterwards, the aircraft was advised that the ILS-PAPA procedure for runway 32 should be expected. This procedure begins at the CARVOR at 5000 feet and involves flying the

256 radial until a right turn is made onto the ILS LOC. The chart used on the following page shows the MSA for the sector in which the aircraft flew was 5700 feet QNH and of course why the procedure required inbound aircraft to first fly to the VOR. When acknowledging this clearance, the aircraft commander who made all radio communications during the accident flight, advised that should the airport be acquired visually, then a visual approach would be requested.

Shortly afterwards, having just vacated FL 100 for the cleared altitude of 5000 feet QNH with 28 nm still to run on track to the CAR VOR from the north east over the sea, the aircraft commander called field in sight. After verifying that the aircraft would maintain own separation from obstacles, Cagliari APP approved the request. The aircraft began turn to the right and began to track towards a 4nm final for runway 32 which was continued until the subsequent impact with terrain. Shortly after this, Cagliari APP called Rome ACC to check the position of the aircraft (because there was no corresponding return on their radar display) and having been advised that it was leaving FL 072 about 22nm from Cagliari, transferred the aircraft to (Cagliari) Elmas TWR with the proviso that descent should not continue

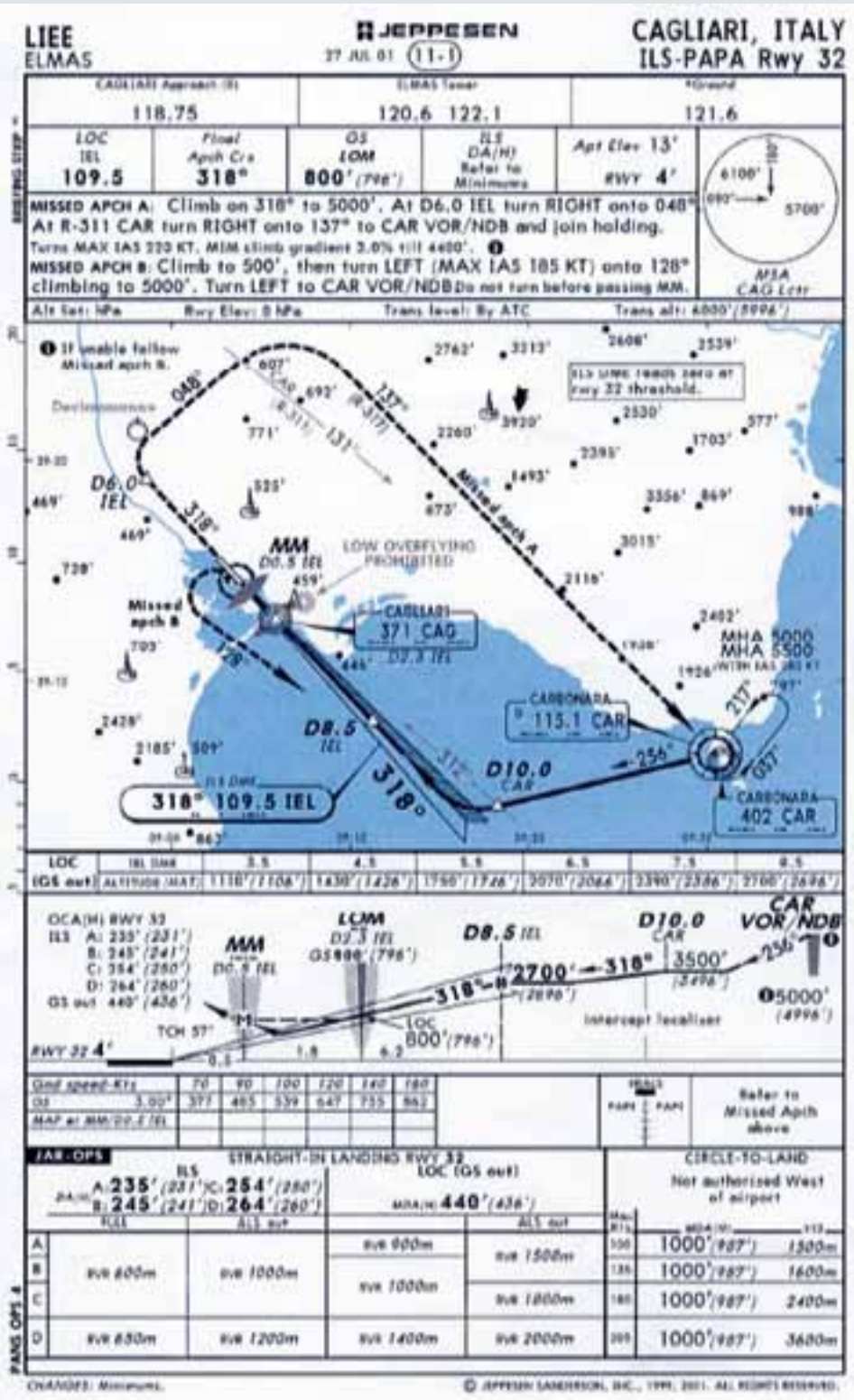
below 2500 feet QNH until approved by TWR.

The aircraft checked in with TWR at 0448Z and were instructed to call on short final. In acknowledging this instruction, the aircraft commander reported their position as 23nm from the Cagliari passing an altitude of 4800 feet. Collision with terrain on track in the Sette Fratelli mountains occurred close to the 3333 feet high summit of Mount Bacumalu in "dark night" VMC just over a minute later. The aircraft was destroyed by the impact and a fuel-fed fire which followed and all six occupants were killed.

The track flown following the approval of a visual approach is shown in red on the topographical chart on page 73, where the point of impact is marked with a black arrow. The track towards the CAR VOR from the north east via

¹ - [http://www.skybrary.aero/index.php/C550,_vicinity_Cagliari_Sardinia_Italy,_2004_\(CFIT_HF\)](http://www.skybrary.aero/index.php/C550,_vicinity_Cagliari_Sardinia_Italy,_2004_(CFIT_HF))

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THE 2004 CAGLIARI ACCIDENT AND AFTERWARDS (cont'd)
The accident investigation

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assumed to be part of the flight crew, although there was no evidence that he played any role in the operation of the aircraft on the accident flight.

There was no evidence of any relevant unserviceability in respect of the aircraft or ground equipment. It was noted that the approach control service for the Cagliari CTR is provided by the Italian Air Force from the military airbase at Decimomannu, located 8.5 nm north west of Cagliari airport and equipped with both Primary and Secondary radar feeds, the former with a 4 second refresh rate.

It was noted that the aircraft had not been fitted with crash protected flight recorders (FDR/CVR) or a GPWS and since the maximum authorised weight of the aircraft did not exceed 5700kg, such equipment was not required. It also considered that "the crew was not particularly familiar with the area around the destination airport" and concluded that the short notice of the requirement to undertake the flights concerned when a duty the following day had been expected would have meant that despite the applicable flight time provisions being met, "the crew (would not have had) an adequate period of rest.....before starting flight activity at night".

It was confirmed that prevailing ICAO provisions for the provision of Air Traffic Services were unambiguous in making the safety of aircraft from impact with terrain or obstacles the complete re-

LEDRO, from where the ILS procedure would have commenced, can be seen as a thin blue line

The Investigation established that the handling pilot for the flight had been the First Officer who had been occupying the left hand seat as part of supervised line training to prepare

for promotion to Captain. The aircraft commander occupying the right hand seat was also the Director of Flight Operations and Chief Training Pilot for the aircraft operator. It was also found that an additional recently-qualified pilot of Italian nationality had travelled on the three flights. Since this person appeared to have been on duty, he was

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- the lack of any ground lights in the area of the Sette Fratelli mountains would have precluded the possibility of achieving effective visual separation from the terrain because as a result the area would have appeared as a uniform “flat black colour”.
- The Cagliari APP radar display would not have provided continuity of radar returns from the aircraft.

The cause of the accident was stated as “the conduct of the flight to a significantly lower altitude than the prevailing MSA which was insufficient to maintain separation from terrain during a visual approach at night in the absence of adequate visual references”. Seven contributory factors were identified, five of which concerned the actions of the pilots, one the absence of contouring on the proprietary charts provided for the flight crew and one the absence of a TAWS on the aircraft.

Seven Safety Recommendations were made, two to ENAV and one to ENAC on 14 July 2004 and four more in the Final Report, variously addressed to ENAC, ENAV, the Italian Air Force, the Civil ANSP and EASA. One of these was a restatement of the earlier one to ENAC concerning TAWS which had not been actioned at the time of publication. 5

sponsibility of the aircraft commander unless radar control service was being provided. When compared to State requirements for night visual approaches, the Investigation concluded that “AIP Italy in force at the time of the accident would....appear to contain additional conditions (for such approaches) compared to the international provisions of ICAO Doc 4444”.

It found that the documentation extant at the time covering the circumstances under which visual approaches could be conducted was contrary to ICAO provisions, not all available in English language in the Italian AIP and ENAV requirements often required reference to documents in Italian which were “difficult to obtain” and were open to misinterpretation.

Whilst the ANSV Investigation was in progress, the parallel Judicial Investigation decided to organize a flight in an aircraft of the same type as that involved in similar flight conditions in order to determine the in flight visibility in relation to the claim by the aircraft commander to have visually acquired the airport at the point he did and to determine any relevant limitations to the radar cover feeding the displays at Cagliari APP. An ANSV Observer travelled on this flight and the Final Report of their Investigation notes that it was found that:

- visual acquisition of the airport was not possible as claimed when receiving approval for the visual approach.

The judicial aftermath

by Carmelo Starrantino and Marcello Finocchiaro, EUROCONTROL

The fact that two Italian Air Force air traffic controllers were convicted of negligence and failing to exercise a sufficient duty of care during the course of providing air traffic service has become quite widely known. However, how this came about is less well understood. What do we know about the court judgments? How could the Italian legal system reach the conclusions that it did?



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ample of how difficult it can be to sustain a 'Just Culture' which will support risk management in a safety-conscious industry that is also compatible with the wider public interest in the proper administration of justice.

The two military controllers who had been on duty at Decimomannu and who provided Cagliari APP service to civil traffic were both charged with multiple manslaughter and air disaster for contributing to the death of all 6 occupants of the accident aircraft. The Italian legal process requires that a case of this sort is determined initially in the local criminal court but this judgment may then be referred to an Appeal Court and the determination of the Appeal Court may then be referred to the Supreme Court. This is what happened in this case

The trial before the court of first instance

On 17 March 2008, the Criminal Court of Cagliari sentenced them to two years' imprisonment suspended and to pay, jointly, an interim compensation amount of € 75,000 for civil liability and court costs.

Pilot error was accepted by the Prosecutor and the Court Judge as the immediate cause of the accident. They

concluded that because the pilots had not appreciated the topography of the area surrounding Cagliari, they had erroneously considered it devoid of fixed obstacles.

In addition, the Court also found that the controllers, through their negligent conduct, had made a substantial contribution to the event. Thus the Judge upheld the Prosecutors argument that there were sufficient grounds for finding that there had been concurrent negligent action involving both the pilots and the controllers.

This negligence was qualified as general and specific:

- General in terms of the infringement of standard expectations in terms of diligence, skillfulness and prudence
- Specific in respect of breaches of operational rules, in this case involving those concerning visual approaches, the lack of separation from obstacles and misleading instructions relating to descent.

The Court concluded that the controllers had violated the rules concerning visual approaches, disagreeing with what was affirmed by the Public Prosecutor's experts who had considered that the behavior of the controllers

This article tries to explain (but not excuse) the rationale that led to the controversial findings/outcomes. It reflects the reality under the current Italian legal system and provides a classic ex-

complied fully with the provisions of ICAO Annex 11 Rules of the Air, ICAO Doc.4444 PANS-ATM and other applicable technical rules and air traffic regulations in force.

The divergence of opinion between the subject matter experts and the Judge was based on the application of specific Italian rules introduced in 1991 by the DGAC (Civil Aviation General Direction). These rules, only applicable in Italy, were enacted through domestic directives No. 41/8879 and 41/8880.¹

For years the existence of these rules was unknown to many pilots and controllers and it wasn't until 1996 that they first appeared in the Italian AIP. Their application in respect of the controllers was a very controversial aspect of the First Instance Judgement. On the one hand, the Public Prosecutor's Experts affirmed that their insertion in the AIP only made them binding on pilots. The Judge on the other hand, was of the opinion that in order for this rule to be applied only to the pilots, it had to relate to a "potestative right" on their part that put them in the position of being able to determine their applicability. Instead, however, he decided that as the controllers had the power to approve or refuse a visual approach to IFR traffic, they too were 'receivers' of the AIP rules.

According to the experts, the relationship between pilots and controllers, with reference to the compliance with technical rules, is founded on a so-called "fidefaciente" statement of the pilot, who is responsible for the consequences that follow from what he states. This view leaves it to the Regula-

tor determine the validity of statements made by pilots rather than the ANSP, because the latter has neither the tools to verify their correctness nor any power of sanction.

ATC's 'Position of Guarantee'

With reference to the crucial issue of the duty to provide separation from obstacles, the Judge affirmed that, because of the prevailing topography in the area of the accident, the controllers had to be more prudent and strictly comply with what was stated in the additional AIP Italy rules. The Judge also ruled that the controllers had to verify the ability of the pilots to address the challenges associated with a night visual approach in the presence of relevant terrain and the possibility of impact during such an approach. Furthermore, controllers were responsible for checking that the pilot was adequately trained, equipped and informed as, in the opinion of the Court, controllers had a "position of guarantee" in respect of the pilot/crew, which involved being proactive in preventing possible aircraft impact with the terrain.

The Court also took into account the nationality of the pilot in command and the Judge took the view that it was easy for the controllers to deduce that he was not aware of the surrounding obstacles. Moreover, according to the Public Prosecutor, the Cagliari APP controller had a specific duty to intervene if an aircraft appeared to be exposed to a dangerous situation, even though its pilot had placed himself in the situation due to his own intent or negligence.

In this case the controller knew that the Citation was heading to Cagliari and might overfly the high terrain of the

Sette Fratelli. It was considered that this view was supported by analysis of the telephone conversations which had taken place between Elmas TWR and Cagliari APP and also by the few traces from the APP radar display which showed that the aircraft was in the area of the Sette Fratelli mountains². In the opinion of the judge this was a very significant matter which strongly affected the position in law of the two controllers.

According to the Judge, if an intervention of the controller is appropriate in order to advise a pilot of the risk of entering prohibited airspace, then the same importance and necessity must be accepted in similar situations such as this accident scenario. That is the controller has a duty to alert a pilot to a potentially unknown (to the pilot) risk.

A further element of negligence noted by the judge was the instruction given by the Cagliari APP controllers to the crew to "...continue not below 2500 feet, further descent with Elmas Tower...". The Minimum Safe Altitude (MSA) in the Sette Fratelli area was 5700ft and in the view of the Court the instruction may have misled the pilots into believing that it was safe to descend to 2500ft in an area where the height of the surrounding mountains was over 3000 ft. In addition, in the opinion of the Judge, the descent instruction might have led the pilots to think that the 5700ft MSA was not related to the topography of the area but to the needs of air traffic management and the prevention of aircraft crossing the protected departure and arrival routes of other airports in the vicinity.

1- In effect these directives represented an additional requirement to the provisions of ICAO PANS ATM applicable to pilots of all aircraft undertaking the carriage of passengers or goods for the purposes of Public Transport. The first one (41/8879) specifically prohibited the use of visual approaches at night for general aviation traffic but not for the commercial air transport, category of which the accident flight was an example. The second one (41/8880) then set six pre-conditions to be satisfied by flights permitted to make a night visual approach as follows including that an alternative instrument approach procedure should be unavailable.

2- One of them admitted to have noticed on the Monti Codi radar monitor that the Citation was en route towards Cagliari crossing the "Sette Fratelli" zone. The controller assessed that the contact was 'weak' and not usable for the provision of radar assistance – which in any case was unnecessary for the ongoing (visual approach) procedure. However, when it was clear that the accident had occurred and it was necessary to locate the wreckage, he was able to use the information to inform the search and rescue activities.

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The judicial aftermath

So, according to this Court, there had been a violation of the controllers' duties of prudence, diligence and skilfulness. Furthermore, because they had failed to provide a timely alert to the pilot after a misleading descent instruction, they had acted in a grossly negligent manner.

The court of appeal

On 18 March 2010, the Cagliari Court of Appeal essentially upheld the judgment of the Lower Court, whilst also finding further evidence of negligence.

The Appeal Judges affirmed that the controllers were aware of the 'dangerous' position of the accident aircraft thanks to the information they had received from Rome ACC, which had controlled the first part of the flight. They then did not provide essential information on the topography of the terrain, thus violating one of the duties set down in the Italian DGAC Directive No. 41/8880.

The Appeal Judges surmised that the controllers' failure to provide useful information for a safe and efficient conduct of the flight was also a violation of ICAO Annex 11 paragraph 2.2 (d). They also found that the defendants had violated the technical rules of air traffic control because the manner of the transfer of control prior to landing had infringed the Italian Air Force "Ordine di Servizio" No. 102, which stated that the transfer of responsibility from APP to TWR in the case of an aircraft approaching to land must take place when the aircraft was in the proximity of the airport. In this case, the transfer of the control took place when the aircraft was 26 nm from the runway.

According to the Judges, the transfer of control to Elmas TWR should have taken place when the aircraft was between 5 and 10 nm on final approach. They

cited the instance when during the night of 23 February (the day before the accident) the same aircraft had landed at Cagliari Elmas to pick up the medical team involved in the heart transplantation, had been cleared for a visual approach procedure only when it was 10 nm away from the airport, notwithstanding that on this occasion it came from the North and so was overflying an area without obstacles. Furthermore, before the transfer to Elmas TWR, the APP controllers had informed the pilot about its position, (as seen on radar), about 7 miles far from the runway. This contrasted with the accident flight only a few hours later when no such position information was provided.

The supreme court of cassation

The judicial proceedings came to an end with the decision of the Supreme Court of Cassation, which delivered its judgment on 10 December 2010 and upheld the previous two judgments.

Unlike the previous judgements, the verdict of the Supreme Court did not mention the DGAC Directive No. 41/8880, but focused instead on establishing the nature of the ATC role with reference to the separation between the aircraft and terrain or obstacles. The Judges affirmed that controllers have a 'policing' function, whereby they are managers and administrators of pilots, on whom they impose discipline, through clearances, which are administrative instructions, in order to ensure the safe, orderly and expeditious flow of air traffic.

'The Position of Guarantor' in the protection of 'Goods'

In the opinion of the Court, regardless of any technical ATC rules, the duty of controllers to separate the aircraft from terrain and obstacles and the duty to do everything possible to ensure a safe

flight, is based on their 'guarantee position' towards aircraft occupants.

According to Italian statute law, there are some very important 'goods' or interests (in this case human life) which, by their nature, require an enhanced protection without which they could not continue to exist. The principle applies to situations where the legal system – given the incapacity of the owners of the 'goods' to ensure complete protection – deems it necessary to determine a threshold of advanced protection, establishing a 'guarantee position' in the hands of third parties who, through proactive behaviours, can support the enhance protection of these fundamental 'goods'.

Given the existence of this principle, the Court considered that the controllers – within their competences aimed mainly at managing the regular flow of air traffic departing, landing and en route – must act proactively to try to eliminate or at least reduce the risk of an aircraft accident once they notice that an aircraft is in a 'dangerous' position.

Pursuant to Article 40 (par.2) of the Italian Criminal Code which states: "Not to prevent an event that is a legal obligation to prevent is equivalent to causing it", it was considered that it was irrelevant that ICAO Annex 11 paragraph 2.2 does not include prevention of collision of obstacles as a function of air traffic control in the circumstances which prevailed in the accident. The judges reasoned that the controller, as well as the pilot, has to be considered as a 'guarantor' in order to ensure the safety of navigation and in general in order to avoid aviation disasters.

The determination of Negligence

The Supreme Court also addressed some of the specific 'negligence' aspects related to the case. The Judges

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took the view that the controllers' conduct was negligent, incompetent and careless because they did not promptly appreciate the abnormality and danger of the pilot's route and underestimated the existence of conditions which could be thought of as non-standard and improper for the safe conduct of aircraft navigation. They considered that the element which characterized the specific culpability of the controllers concerned a violation of the provisions of ICAO Doc 4444, PANS ATM, paragraph 4.3.2.1.1 where it is stated that "the control of an arriving aircraft shall be transferred from the unit providing approach control service to the unit providing aerodrome control service when the aircraft: a) is in the vicinity of the aerodrome...". So, in the opinion of the Supreme Court, the visual approach clearance has to be provided only when the aircraft is in the proximity of the aerodrome.³

ATC Authority and 'Clearance'

Another important aspect examined in the Supreme Court's judgment concerned the nature of a 'clearance'. The Court tried to associate the ATC 'clearance' for a night visual approach with the normal 'administrative' qualification system existing in Italy. According to this principle, the power to grant a permission (to proceed) presupposes that the person who issues the permission must verify that the necessary (safety) conditions are in place. In the absence of such conditions, the person should not issue the 'clearance'. A statement from a pilot confirming the existence of all the necessary conditions should not be the basis for issuing of a clearance which is dependent upon them being satisfied because a pilot's perspective might not always

be sufficient to meet every legal requirement.

In terms of this general principle, the issuing of a clearance by a controller must therefore always be preceded by a check carried out by the same person and this is demonstrated by the fact that a such a check is also necessary in case of "silence/assent" or "fidefaciente statement" when, by the deadline for its release, the competent authority can always require the receiver (the pilot) to clarify or to produce additional documents, and in their absence the releasing body (controller) should deny the clearance request.

On the contrary, the lawyers acting for the controllers argued that it is not practicable to place the current air traffic controller clearance responsibilities within the standard 'administrative' framework. The authorisation implicit in a clearance should not be considered as an 'administrative' act that can only produce effects if the recipient is willing to comply. Rather, they argued that an ATC 'clearance' doesn't have any coercive power to impose specific behaviour on the recipient. The pilot in command is in reality not bound to unthinkingly comply with a clearance but is able to deviate from it in the interests of safety. So therefore a 'clearance' cannot be considered as an 'administrative' act but as an instruction in the wider sense.

The Supreme Court also dealt with a matter not covered by ICAO concerning the presumed duty of the controller to issue clearances not only for the requirements of safety, but also in response to pilot requests to expedite traffic (e.g. for short-cuts, direct routings) and flight efficiency (fuel, time)

reasons. Notwithstanding that ICAO Annex 11 paragraph 2.2 obliges ATC to maintain a safe, orderly and expeditious air traffic flow, the Court stressed that when ATC provides a clearance it should not be influenced by any requests from a pilot to reduce the duration of the flight or the fuel consumption because these are private economic interests of aircraft operator. The decision-making process of the controller must be guided by and prioritise the primary requirement to preserve flight safety.

The Court opined that since a clearance does not have mandatory status in all circumstances, it can and should be followed only if it is safe to do so. The objective of a clearance can be evaluated only in association with safety considerations and never autonomously. On that basis, the Judges concluded that controllers must comply with their professional duty concerning the obligation to ensure both the regular flow of air traffic and the safe operation of aircraft.

Conclusion

In Italy at least, there is a need for the judiciary and aviation professionals to be more aware of each others perspectives on criminal prosecution and operational issues connected with ATM. This case exemplifies how international aviation provisions are subject to the interpretation of Judges, given that the administration of justice is a prerogative of each State acting alone. It is nowadays widely acknowledged that an improved dialogue and a mutual understanding between the Judiciary and specialist professionals is the only way to make progress and move forward in terms of Just Culture development. **S**

3- After the Court of Appeal judgement the Italian Air Force suspended the visual approach procedure at domestic airports and ENAV did the same after the Supreme Court judgement. Nowadays, the Air Force permits the visual approach procedure only for military aircraft. On the civil side, ENAC has drafted a new procedure but so far it is not in effect.

THE 2004 CAGLIARI ACCIDENT AND AFTERWARDS (cont'd)

Air cops and mountain tops

by **Alberto Iovino**

In my opinion, the controllers acted correctly. But my opinion is not the point here. The point here is what happened in Court afterwards.

At all stages in the legal process – trial, intermediate appellate and last resort – the various Courts recognised the primary responsibility of the flight crew, including their statement that they had visual contact with the airport from a position and in environmental conditions which, as it was demonstrated, did not allow for it. Nevertheless, they also unanimously blamed the two controllers for having contributed to the accident.

Conviction was based on two main lines of reasoning, respectively addressing specific and generic guilt.

On the one hand, the magistrates performed their own analysis of the operational rules and procedures the controllers were supposed to apply and, contrary to the opinion of expert witnesses who included a pilot and a controller, came to the conclusion that there had been significant error and negligence.

On the other hand, they assigned to air traffic control the role of policing air navigation. This may not be an easy con-

cept to understand, and it may be even harder for people familiar with different legal cultures. In simple terms it means that, besides and beyond specific duties and procedures, controllers are deemed to hold a general responsibility to guarantee the safety of those who fly.

The first line of reasoning is obviously difficult for someone who is familiar with aeronautical matters to agree with. Whilst our job, as any other human activity, is not one hundred percent free of 'grey areas', none of us would doubt that the objectives of the air traffic control service as prescribed in Annex 11 do not include prevention of collision with terrain, or that a professional judgment is required to determine whether a radar is fit for operational use and that if it is not, whilst intermittent information would might aid search and rescue, it could not be employed in service provision. You read the meaning which was attributed by the Courts to words and actions and you know that it is unreal and that no pilot would understand it that way either – OK, never say never, but you can see that mental processes applied to words and actions came from a different world, when the world in which the accident occurred should be taken properly into account.

Still, and even though culture is always a factor, this appears in the first place as an individual issue. By that I mean that a different judge might have followed a different approach and may have taken more notice of

testimony, because, although subject matter experts know less about law than judges, they are far better able to understand and explain what happened in its proper context. In a different cultural environment, many more judges might have been of that different opinion but nevertheless, in the one we currently have, it can still be a one-to-one match in court and it is up to the defence lawyers to play it at their best.

REF

The second way of reasoning, even though individuals are always a factor, is broadly cultural and one against which there is in the end no other real defence but a cultural change, possibly induced by legislative action. In a scenario as intrinsically permeated with hindsight as that of criminal justice, if you are held responsible as the last line of defence when something goes wrong, it is automatically your fault just because it did and all that is left to discuss is the extent to which you are responsible and whether you acted with intent or otherwise.



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is currently head of ATS Operational Procedures Unit of ENAV Italy. Formerly an airline employee for 8 years, he became an ATCO in 1997, working as tower, approach and area controller.

This is the picture we are looking at. In my opinion, the arguments and conclusions of the Courts are all in all wrong. But my opinion is not the point here. The point here is that the Court evaluated facts from another perspective.

Since the final verdict in this case was handed down, action has been taken with the aim of modifying both the national technical regulations which adopt the ICAO Annexes, and the Air Navigation Code. Taking part in these activities, I was more than once faced with the view that the risk of prosecution was in the end just a professional risk. Controllers, it was said, are well paid to perform challenging tasks and should accept the possibility of unwanted

sharing of ideas and experiences, often proactively, sometimes following accidents and their casualties. Air navigation is a complex system where roles are defined and duties detailed and it is in the unquestionable public interest that such roles and duties are adhered to. And it works.

When a controller sits at his working position, he must be confident that what he is asked to do is what he was taught. Where criminal verdicts say this is not (entirely) true, there is a problem for the system, even before than for individuals. Other duties are added, to perform which no standard procedures are made available, so that each controller is eventually required to con-

The law is the law and nobody should think that one can be dispensed with it by simply following technical professional rules. Nevertheless, there is a general interest in the integrity of all complex and highly specialised systems like air navigation, which has to be recognised and pursued through the law, rather than against it. Evolving a shared awareness of this necessity is a step that many advanced societies still seem unwisely hesitant to take.

This is a sad story. Six people died, people with families and children, a well known cardiac surgeon and a promising junior in that field. Incidentally, the heart was recovered,

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ed consequences for them arising from their actions, thus accepting equality before the law. Arguments against that thinking are often perceived as a quest for licence to kill. I tend to see it a different way.

Controllers are hired through selective processes. They are then subject to extensive ab initio and recurrent training on the operational rules and procedures which they are required to strictly comply with. Such rules and procedures have been developed worldwide over decades and are continuously revised and refined through the mu-

tinuously assess what his responsibilities are and how he should fulfil them. I believe this constitutes a serious safety issue, whose public relevance goes far beyond the otherwise legitimate concern of single controllers about potential judicial outcomes. Neither should the solution be to use the verdicts of the Criminal Courts as a reference for developing operational procedures, since this would put each country out of the global aeronautical community and the common standards and practice which such verdicts often widely contradict and ultimately, bring that community to an end.

unusable, among the debris spread over an area of almost seventy thousand square meters; the patient, a 52 year old man, had to wait a few more weeks for the availability of another one. Though this transplant was initially successful, he did not make it. Sad stories are part of life and it is no use saying anything about the pain of those who suffer them. Whilst other sad stories are bound to be told, we must try however we can to ensure that the very same sad story does not have to be told again, to make the telling a little, just a little, less sad. 5



If it had happened in your country, what would the judgment have been?

by **Marcello Scala**

The judgement in the criminal trial did not follow expert advice provided to the Court which completely rejected any controller responsibility but found instead that the controllers were culpable. As a consequence, there were outcomes, direct and unforeseen, in the aviation domain.



Marcello joined the Air Force in 1989 as an officer. Here in he got the rating-specialization of ADI-TWR, APS-RAD-TCL, APS-RAD- PAR, ACS-RAD, OJT and SPV. He left in 2005 the Air Force with the rank of major and was hired in ENAV where he has been working as ACS-RAD-TCL, ACS-RAD and OJT. In 2002 he graduated in law. Since 2009 he has been collaborating with ANACNA and from 2012 he is the director of the Legal Affairs Committee.

The Judges, after an analysis of the facts presented, found that the conduct of the controllers acting as agents for the provision of air safety amounted to imprudence, negligence, malpractice, non-compliance with the rules on common experience and those regulating specific matters.

The Court sentenced the controllers to two years imprisonment and also found them liable for damages and compensation, although these were paid by the ANSP, the Italian Air Force, as their employer.

The ATS given by Cagliari APP had been a non-radar approach control service (procedural approach control). At the time of the accident the personnel on duty were one radar controller, responsible for the radar room, one non-radar approach controller and one air traffic control assistant.

Even though the Judges accepted that the accident was largely due to the pilots' loss of situational awareness during descent, the Court considered that the part played by the air traffic controllers was equally fundamental.

I will now discuss the judicial reasoning which led to the convictions. In respect of the controller as a professional and taking precedent into account, the Courts who heard the case – and the Supreme Court in confirming the judgement – took the view that a controller is responsible not only for the avoidance of collisions between aircraft as described in Doc 4444, but must also actively seek to prevent any type of aircraft accident. In Italy, a controller is seen as an agent with a general responsibility to act as a guarantor of flight safety, clearly a role which greatly exceeds that of a controller's professional responsibility.

Effectively, the judgement confirmed the legal position of a controller as that of policing air navigation role with responsibility for multiple air space users – pilots. He has to give "orders" based on this responsibility whilst taking into consideration also a multitude of other variables that don't lie within his area of professional responsibility.

The concept of the controller as an air navigation policeman has to be understood with the following connotations:

- all that a controller usually does during his shift on duty should be aimed at achieving the primary objective of the air navigation safety;
- his function is to protect public interests.

In law, the Court had considered the controllers' to be:

- (1) careless and not in compliance with expected competence in giving the night visual approach clearance so far from the landing runway
- (2) responsible for failing to verify the awareness of the pilots of the surrounding terrain and not communicating, in any way, useful information about it;
- (3) responsible for having introduced ambiguity when issuing the descent restriction of 2500 feet¹.

Taking into consideration the technical rules, especially the international ones, the Court considered that the Chicago Convention under which ICAO had been established did not intend to limit the full and exclusive sovereignty of each State, but to facilitate the highest possible level of uniformity between the contracting States.

MENT

Specifically, the Court considered that the Convention did not lay down any rule limiting the extent of responsibilities of controllers and neither was it competent to modify national regulations. It defined only the international obligation for every contracting State to conform to the standard regulations and notify the ICAO of differences.

However, the Judges also stated that the determination of the general function of guarantee is based on not only legal grounds, but that these were also supported by ICAO Annex 11 where it says that the duty of ATS is to provide advice and information to facilitate a safe and efficient flight². In my opinion, this reasoning amounts to a re-codification of the Annex with an extended meaning so that the Court changed, and stretched, the real logic of the rule³.

Referring to the responsibility for the disaster the Court stated that the controllers could have prevented the disaster if they have provided the appropriate information to the pilots⁴. In the judgement it was stated that, following the precedent set in earlier cases, the circumstances of the accident led the Judges to be confident that different conduct of the controllers could, with a high level of probability, have prevented its occurrence.

Although the professional advisers to the Prosecutor didn't identify any fault on the part of the controllers in terms of their conduct and considered that it was in line with the applicable procedures, the aforementioned judgment assumption was, in accordance with universal legal process⁵ the entire prerogative of the Judge.

As a result of this judgement, there has been a loss of understanding as to what conduct is expected from controllers in such situations. It now appears that professional people not only have to adhere with their professional rules but must also demonstrate a degree of proactive intervention in the interests of safety which conform to the concept of a general guarantee.

The operational consequences of the judgement were as follows:

- Just after the publication of the reasons of the judgment, the Italian Air Force suspended clearances for visual approach until such time as the Regulator for civilian air traffic establishes revised procedures. The reasoning was that although the conduct of the controllers was in line with the prevailing procedures, the conviction of two of them indicated that the procedures they were working to were wrong.

- After a while ENAV⁶ also suspended the issue of clearance for visual approaches
- Although a draft revision is now ready, the application of the visual approach is still suspended;
- The aviation domain in Italy suffered a loss of confidence in the legal system.

However, the problem is not, obviously, just one of the ATC obligations which must be accepted when issuing clearance for visual approaches, but with the wider implications. What is the correct conduct that a controller has to comply with in order to be considered without any fault? If the judgement in this case continues to be upheld this is an important question for the determination and compliance with procedures.

As understood by the judgement, a controller is given a general responsibility for the safety of an aircraft in flight, acting as a form of guarantor. Respecting this model, where does the controller find how to be compliant with the conduct that, "ex post", could be expected?

What is, in a legal system based along these lines, the certainty of the professional rule?

The question needs to be asked: is a professional domain that follows rules that do not guarantee protection from prosecution should an accident occur better than one in which this uncertainty doesn't exist? I don't think that uncertainty supports any type of national interest! **S**

1- This restriction was prescribed by Air Force procedures in the event of heavy operational traffic in the ATZ.

2- 2.2 (d) The objective of air traffic services shall be to provide advice and information useful for the safe and efficient conduct of flights.

3- The general function of guarantee and its evaluation: the objective is to establish if what happened was caused by the agent due to not compliance with duty of diligence, prudence and expertise; an evaluation done ex post by the Court. Because of this line of reasoning there is a loss of certainty in the professional rules; something unacceptable for all high skill professional jobs.

4- Crime of omission (cp 401I).

5- The judge, under Italian legislation, is the Expert of the Experts – peritus peritorum – which confirms that he determines his judgement after considering the opinions of appointed subject experts, but that these are provided only as a support to him.

6- The Italian Civil ANSP.



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Loss of separation

Editorial note: The situational examples have been based on the experience of the authors and do not represent either a particular historical event or a full description of such an event. The scenarios are rather exemplified facts aligned to illustrate operational safety and human performance considerations.

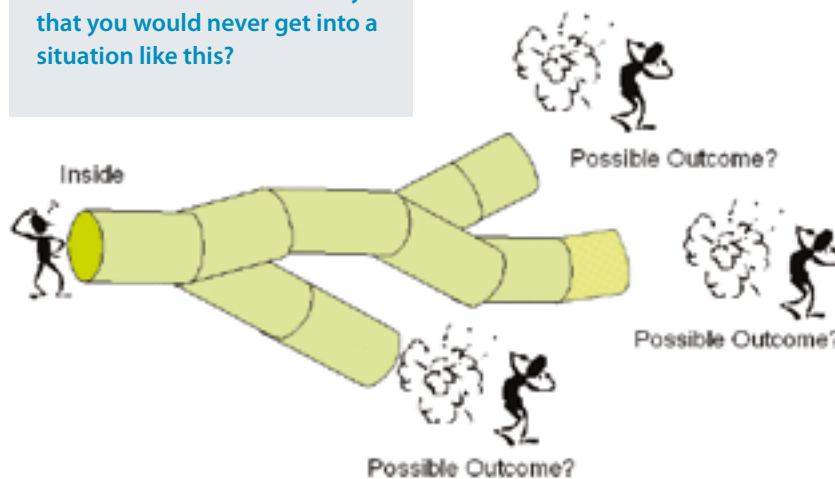
▶▶ [page 84](#)



Loss of separation (cont'd)

THE FACTS

Read the story as it develops, position yourself in the context without knowing the actual outcome. How confident are you that you would never get into a situation like this?



Are you aware of the consequences of working in back-up mode(s) at your work place?

While handling the last of the regular late flights in your area, the technician comes up again and asks if they now also can start working on the telephone system that you use to communicate and coordinate with other ATC units. You realise that in the next few minutes you'll need to use that system for a couple of routine hand-over coordinations with controllers in adjacent centres.

What would you do?

You explain to the technician that you need to use the telephone system for another five minutes or so, and ask him to come back later. He agrees to do so and you continue to handle your traffic. When the technician returns a little later, you don't have any more imminent co-ordinations to do so you give him permission to start work on the telephone system.

After a little while you receive details about a delayed flight inbound to a regional airport located in (or rather under) your airspace. In day time, traffic to that airport is handled at a dedicated working position because of the limited manoeuvring space for the interception of the ILS. You are familiar with the procedures but you never have handled an aircraft going to that airport during night hours.

What would you do?

You adjust a radar display at an adjacent working position in a way that will allow you to vector the aircraft to

The operations room of the Area Control Centre where you work as a radar controller is gradually becoming quieter as traffic decreases at the end of the day. You're beginning of a night shift, and you're responsible for all traffic in an area that in daytime conditions is split into several sectors.

There is one other controller on duty with you during the night, plus one assistant controller. The other controller is not in the operations room however as, in keeping with local practice, that controller will be taking a rest break for most of the night until traffic numbers begin to pick up again towards the end of the shift.

What is the staffing situation in your ATC unit during night shifts?

A few minutes after the supervisor from the afternoon shift has left the operations room to go home, a technician approaches your work station and asks approval to start with maintenance work that is planned for this night. You remember that the supervisor mentioned something about scheduled maintenance before he left, so you tell the technician that they can start with the work. The technician subsequently instructs you to switch to the back-up mode of the ATC system, which you do.

You are aware that in the back-up mode you don't have all system functionalities available (compared to the normal operational mode), but as you've worked in back-up mode on other occasions without any difficulties you're not concerned about the situation at all. The main thing you need to remember is that when in back-up mode increased horizontal separation must be applied.

the ILS for the regional airport. You also select the appropriate frequency for the communication with that aircraft. This means you'll have to divide your attention over two radar displays, and communicate with aircraft at two different working positions, during the approach of the delayed aircraft but since you expect only two aircraft in your high-level sector at that time it doesn't look like a problem to you.

You decide to make a telephone call to the Tower at the regional airport to coordinate about the inbound flight. The phone line appears to be unserviceable however, which makes you realise that this must be a consequence of the maintenance activities you approved a little earlier.

The first aircraft checks in at your main working position and you clear it to continue its climb to its requested flight level. The pilots correctly acknowledge the climb clearance, after which there is no further communication necessary with this flight. You turn your attention again to the coordination with the regional airport, this time using the telephone back-up system. To your surprise you hear a recorded message in the local language that tells you that the connection cannot be made and that you should check the number you're trying to reach.

What would you think?

You ask the assistant controller to go and look up the correct number for the Tower at the regional airport. The aircraft inbound to that airport checks in on the frequency at the adjacent working position, and just when you're moving over there the second aircraft that you were expecting checks in on the frequency at your main working

position. You tell the aircraft at the adjacent position to stand by, and you move back to reply to the other aircraft which reports at the same flight level as the first flight at this working position.

Because of the back-up mode limitations, the new aircraft isn't displayed with a data label on your screen yet so you tell the pilots to change their transponder code (which will allow you to manually attach a label once the code is received). After the instruction is acknowledged you switch to the adjacent display to reply to the aircraft inbound the regional airport. You tell them what runway to expect, that it will be an ILS approach, and you clear them to continue their descent to an intermediate flight level.

Meanwhile the assistant controller has returned with the phone number for the Tower at the regional airport. In the back-up mode of the telephone system you manually dial this number, after which you hear the same recorded message as before.

What would you do?

You briefly consider asking a controller at an adjacent centre to do the coordination with the regional airport on your behalf, but since this would require the use of the same telephone system that seems to be letting you down you decide against it. Instead you ask the pilot of the inbound flight to do the coordination with the tower on your behalf on his second radio set, to which the pilot agrees. You subsequently clear the aircraft for further descent.

Next you switch your attention back to the display at your main working posi-

tion, and you notice to your surprise that the two aircraft you have there are on converging tracks at the same flight level, and that the distance between them is close to the minimum you can apply in the back-up mode.

What would you do?

You instruct one of the aircraft to descend to a lower flight level. There is no immediate reply, so you once again instruct the aircraft to descend and you tell them to expedite. This is acknowledged by the crew and you provide traffic information about the conflicting aircraft while you see on your display that the aircraft indeed is starting to descend. You're satisfied that the conflict is resolved.

What would you think?

At the other working position there is a call from the aircraft inbound to the regional airport. You move to that working position, and you vaguely register an unidentified noise from the speaker at your main position.

The inbound aircraft reports being in positive contact with the Tower at the regional airport, so you clear them for further descent and for the ILS approach procedure. While the crew acknowledges those clearances you again notice some noises from the speaker at the main working position.

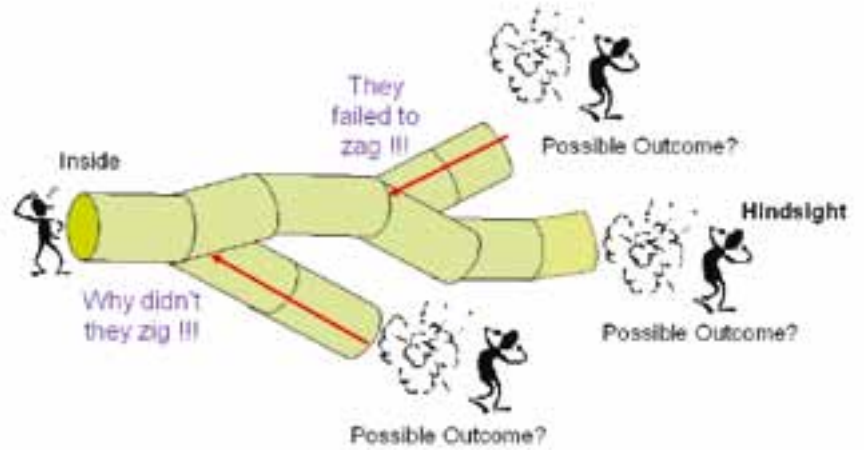
You transfer the inbound aircraft to the Tower at the regional airport and you now turn your full attention again to the traffic at your main working position. You're surprised to see only one fading radar return, and your calls to the aircraft remain unanswered.



Loss of separation (cont'd)

DATA, DISCUSSION AND HUMAN FACTORS

This section is based on factors that were identified in the investigation of this occurrence. Read the story knowing the actual outcome. Reflect on your own and others' thoughts about the case, and see how easily these might become judgmental with hindsight. Can you offer an alternative analysis?



Factors that were identified in the investigation of this occurrence included:

Single controller on duty. Although it was not an official procedure, it was common practice at the facility concerned to operate during night hours with only one controller in the operations room.

The facility managers were aware of this practice and tolerated it, for it made it easier for their staff to cope with night shifts.

The controller had worked like this in several other night shifts and he was quite happy to do so again on the night of the occurrence.

The single controller operations were tolerated on the assumption that the lack of controller redundancy would be compensated by an automated safety feature (Short Term Conflict Alert) integrated in the radar data processing system that was the heart of the controller's traffic display.

This safety feature however was not functioning at the time of the occurrence, as a consequence of the maintenance work.

The controller did not know this.

Maintenance work. The maintenance work was related to the upcoming implementation of a different structure of the sectors in the ACC's airspace, and had been scheduled for that particular night. Since it was considered a major change to the existing system configuration, more technical staff than normal were present in the operations room to assist with the maintenance activities.

This included a Systems Supervisor, who would not normally be present during a night shift (even if there was planned maintenance), and a controller with a technical management role in the maintenance process.

The presence of those two individuals was not known to the controller on duty in the operations room.



He therefore couldn't consider calling for their assistance when the problem with the back-up telephone system was developing.

Briefing materials. The controller had not read the available self-briefing document pertaining to the maintenance work before starting his shift.

The document contained little more than the announcement that there would be maintenance work during that night. There was no information concerning the implications for the ATC system, e.g. that the Short Term Conflict Alert would be unavailable, or that the automatic correlation between the radar data and the flight plan data (labels) would be lost.

This means that the fact that the controller did not read the briefing document had little or no bearing on the developments later that night.

The outgoing supervisor had not provided any information about the consequences for the ATC system, and had not informed the controller about the simultaneous maintenance work on the telephone system. He also didn't mention that there would be a Systems Supervisor and a technical management controller present in the operations room to assist with the maintenance work during the night.

Training on back-up mode operations. The controller was not familiar with the features of the back-up mode, e.g. what systems or system components would not be available compared to the normal mode. In fact most other controllers at the facility were equally unfamiliar with this.

It was established that there had been no formal training provided for working in the back-up mode at the facility.

Traffic to the regional airport. It was unusual that there was traffic for the regional airport that late in the evening. The flight had experienced a delay but was now on its way to the airport, which was its final destination.

The controller had received no prior information about this flight, so he couldn't take it into consideration when allowing the other controller to leave the operations room.

The controller set up the radar display at an adjacent working position

in order to handle the aircraft according to the normal procedures for the regional airport. He also selected the appropriate communication frequency at that working position. The distance between the two working positions was just over one metre.

The facility procedures stipulated that a dedicated controller should handle the traffic for the regional airport, but in view of the low amount of traffic the controller didn't arrange for the second controller to return to the operations room.

Because the approach procedure needed to be coordinated with the Tower at the regional airport, the controller wanted to contact the Tower by using his telephone system.

Telephone system. When the controller first attempted to reach the Tower at the regional airport, he used the telephone system that he had released for maintenance work shortly before.

The controller remembered that maintenance was in progress on the telephone system, so he correctly used a back-up function of the same system to try and call the regional airport.

For this function he had to work his way through several menu layers of the telephone system display screen.

The telephone system had been introduced a few years earlier and in the controller's experience it had always functioned well. He therefore considered it a reliable system.





Loss of separation (cont'd)



DATA, DISCUSSION AND HUMAN FACTORS

Unknown to the controller however, or to anyone else in the organisation, there was a flaw in the telephone system software that caused a discrepancy in the numbers being dialled (or more correctly in the frequency of the tones generated by the system which correspond with numbers).

The number that was programmed for the regional airport in the system was correct, but because of the software flaw the number that was actually contacted was a wrong one. The response from that number was the recorded message advising the caller to verify the number.

When the controller later manually selected the (again correct) number for the regional airport, the software flaw in the telephone system led to the same result.

The controller could have used a cell phone at the desk of the supervisor to contact the regional airport, but he was not aware of this option.

Note: This section is offered as an alternative way of analysing the occurrence. Key words from the Human Error in ATM (HERA) methodology are presented with a brief explanation of how they relate to the occurrence.

Lack of knowledge. The controller did not have all required knowledge about the consequences of working in the back-up mode. He furthermore did not know that potentially useful support staff was present in the operations room.

Risk recognition failure. As a direct result of his lack of knowledge about the consequences of working in the back-up mode, the controller was unable to recognise the risks associated with operating a second working position.

Preoccupation. When the first attempts to communicate with the Tower at the regional airport were unsuccessful, the controller became preoccupied with solving that problem. Consequently he gave less attention to other tasks. (Note: this phenomenon is also known as "tunnel vision".)

Monitoring failure. While busy vectoring the delayed aircraft to the regional airport, and while working to solve the communication problem with the Tower at the regional airport, the controller didn't adequately monitor the traffic on his main display.

Incorrect assumption. When the controller saw that the aircraft he ordered to descend was actually doing so, he incorrectly assumed that the conflict with the other aircraft was resolved.

Spatial confusion. When providing traffic information to the descending aircraft about the position of the conflicting aircraft, the controller used "two o'clock" where it should have been "ten o'clock". This particular confusion is not uncommon for persons in stressful situations.

- Contextual conditions (in no particular order).**
- Poor briefing materials
 - Unfamiliar task in routine operations
 - Inadequate recurrent training
 - Alarms/alerts – unavailable
 - Maintenance work on multiple systems
 - Single controller night shift operation



- Management decisions in staffing and facilities
- Management decisions in safety policies
- Support from other units

Prevention strategies and safety barriers

If the controllers at the facility where the event took place had received a more thorough training on the consequences of working in the back-up mode of the ATC system, it would have been easier for the controller to recognise the risk posed by the combined conditions that night.

The ANSP should have had a policy in place governing maintenance work

on multiple operational systems at the same time. A simple yet effective counter-measure would be to have a minimum of two controllers present in the operations room at all times during such periods.

If safety net functions of the ATC system (e.g. STCA) are temporarily not available, controllers should be made aware of this at their working position in a clear and direct manner.


Whenever an ATS unit is conducting planned maintenance activities that involve operations in a back-up mode, all adjacent units should be notified in advance. Communication plans should be in place (and tested!) to enable coordination between the units during the period of maintenance.

KEY POINTS

The consequences of performing maintenance work on multiple systems during a night shift were not fully understood at the organisational level. This resulted in a situation where a single controller in the operations room had to find a work-around for an unexpected problem, which prevented him from allocating sufficient attention to the traffic situation.

Although the controller thought he had adequately resolved a conflict between two aircraft at the same level, unbeknown to him it had required a TCAS Resolution Advisory to be triggered onboard both aircraft to ensure safe separation. One of the crews responded to the Resolution Advisory while the other crew followed the controller's instruction. This resulted in both aircraft descending towards the same point in space where they arrived at the same time.

This scenario highlights the importance of:

- a cautious approach with respect to maintenance activities on operational systems;
- minimising single controller operations;
- recognising the safety implications of changing circumstances;
- avoiding assumptions. 





Misunderstandings in Air Traffic Communication

by Graham Elliott

"Incorrect or incomplete pilot-controller communication is a causal or circumstantial factor in 80 percent of incidents or accidents..." SKYbrary¹

Graham Elliott

was the FAA Program Manager in Oklahoma City, USA, where he led U.S. support for the introduction of ICAO English proficiency standards in testing and training for airlines and air traffic control in more than 45 countries in Africa, Asia, Central America, and the Middle East.

Misunderstandings in ATC Communication was prepared by a psychologist, applied linguist and pilot, Dr. Immanuel Barshi, in the Human Systems Integration Division at NASA, and Candace Farris, a researcher at McGill University in Montreal. The 252-page book comprehensively reviews the aviation communication literature, reports an efficient experimental method to investigate the aspects of aviation speech and listening at play, and delivers solid recommendations to address real-world aviation miscommunications. The book sorts through a complex combination of factors from multiple sources to identify which ones contribute to miscommunications. The findings should dispel some common assump-

tions about reasons for pilot-controller miscommunications.

The research reported suggests that the communications error rate can be lessened by reducing ATC message length, and by training native English language speakers to take responsibility for the success of communications in English.

The purpose of the study was to better understand some of the factors influencing breakdowns in ATC

communications; what the authors report is that read back errors grow as the number of topics in a message increases. Problems do come from distractions and interruptions from the workload in the cockpit and from poor English language proficiency, and it is often said that controllers "speak too fast" which is often seen as the heart of the problem. However, perhaps somewhat surprisingly, speech rate is not the main culprit causing communication breakdown. Nor, by itself, is



Barshi, I., Farris, C. (2013).

Misunderstandings in ATC Communication: Language, Cognition, and Experimental Methodology.
Burlington, Vermont: Ashgate.

poor English language proficiency. Using the “Barshi Navigation Paradigm”, a laboratory environment to examine pilot-controller communications, overly-long messages were found as the chief cause of miscommunication.

While rapid delivery of commands, elision of words, stress and workload, and unfamiliar accents all take their toll, solutions to problems identified in the experimental data are clear: misunderstandings in ATC communication are reduced if controllers' messages are limited to three pieces of information. More than that and errors in read backs and hear backs and repeated transmissions are liable to climb rapidly.

Further, the authors recommend that when the pilot is either a non-native speaker of English or appears to be under a heavy workload, controllers

should limit each message to two pieces of information. And even at the cost of extending communication time, when an abnormal or emergency situation is being handled, it is suggested that one instruction at a time is probably best.

Until controller-pilot data link communication is more widely used and controllers are routinely able to transmit data directly to a flight deck computer, ATC depends upon voice communications. On the basis of the findings described in *Misunderstandings in ATC Communication*, controllers should be trained to resist the urge to say all they have to say in one long transmission. Satisfying as that may seem, it is a precursor for weak information transfer. The authors confirm that more read back and hear back errors occur when pilots are unable to fully understand, remember and process information in messages.

Bearing in mind the North American origin of the book, it reports that the origin of poor communications is found in both the controller and pilot communities and that both native English speakers and their non-native-speaking counterparts are involved. It recommends that native English speakers should be taking responsibility for the success of interactions. Apparently this is not widely addressed in pilot and controller training and neither is training in strategies to solve communications breakdowns required for licensing.

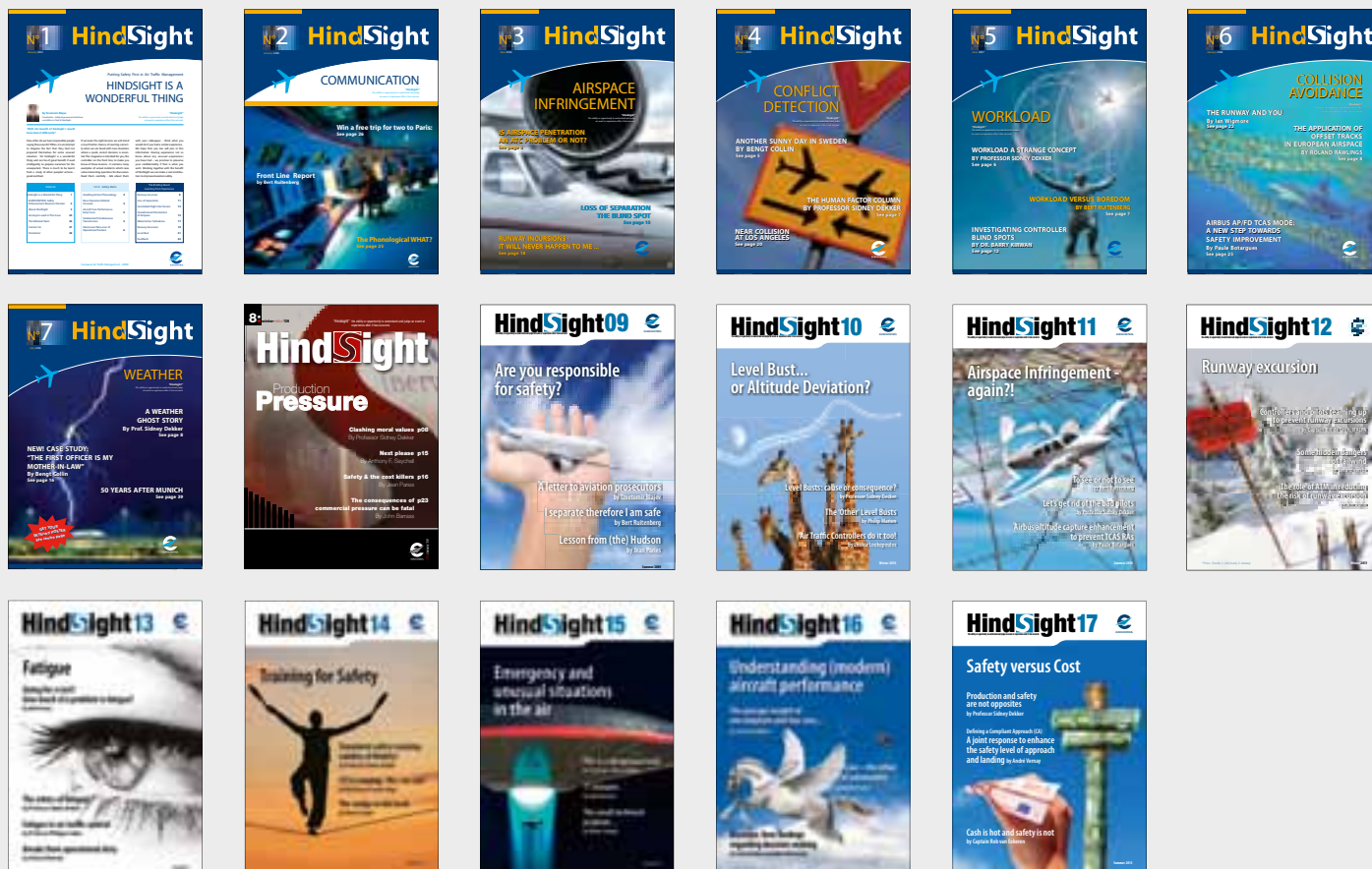
Witness an exasperated JFK controller unfairly featured on YouTube². Frustrated by his inability to communicate successfully with a taxiing Chinese flight crew, to keep his traffic moving efficiently he gamely tries for a ninth time: “I’ll try it again. It’s a question. Hold your position. This is a question, interrogative. Have.. you.. been ..cleared ..in ..to ..your ..gate?”

Not surprisingly, even native English speaking pilots struggle with overly long messages. A British pilot preparing to depart JFK is reported as having difficulty assimilating seven separate pieces of information for his Merit 3 SID – Canarsie climb; vectors to the Putnam transition; 5000; 330; squawk 1607; Ground 121.9, all delivered in rapid ‘Brooklynese’. As he attempted again to accept his clearance, he politely apologised with “you say it so quickly and in such a strange accent, I just don’t understand.” Research in *Misunderstandings* claims to show that with only three pieces of information per message, neither the speech rate nor the regional accent would appear to be barriers to effective communication. Maybe not all would agree...

Meanwhile, until data link spreads more widely, it may be that we should look to improve information transfer by voice-to-ear transmissions between controllers and pilots by first, the judicious limiting of commands to three, or fewer when communications are breaking down, and second, training in strategies for native-speaking English pilots and controllers to take responsibility for successful information transfer. 5



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In the next issue of HindSight: Runway Safety



Putting Safety First in Air Traffic Management

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