Hind**S**ight**32**

Human and organisational factors in operations

THE NEW REALITY

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A SURGEON'S TAKE ON HUMAN AND ORGANISATIONAL FACTORS
A CONVERSATION WITH **MANOJ KUMAR**

Plus much more on human and organisational factors in aviation, shipping, healthcare, rail, and beyond.

Tony Licu is Head of the Safety Unit within the Network Manager Directorate of EUROCONTROL. He leads the deployment of safety management and human factors programmes of EUROCONTROL. He has extensive ATC operational and engineering background, and holds a Master degree in Avionics.

I am writing this foreword at the end of a rewarding but emotional week, both personally and professionally. Among many things, my youngest son turned five, I got my first shot of vaccine at work, and I had the privilege to co-moderate an amazing webinar by German psychologist Markus Flemming on mental flexibility for ATCOs, reflecting on handling changes in demand in a sporting context. This was a real revelation on how to refocus and learn from sports. I was initially going to write about how the new reality is, and will be, different. But based on what I heard from Markus, I would like to introduce a provocative thought: **the new normal is the old normal.**

Instinctively, you probably disagree with this. I assure you that we share a view that the new reality is likely to be different from old one. I have the privilege to have read some of the *HindSight* content already. In this edition are articles and interviews that show how the pandemic has dramatically changed the lives of many: people lost jobs and for those that didn't, new working patterns have affected teamwork and blurred the work-life balance.

But as many of us go back to our jobs – in the Ops room, in the cockpit or in the office – in many ways, things are much the same as before. So, what

is different for me? While the world has changed, as it always does, the fundamentals of work remain broadly the same. And I am the same person. Most things at work are more or less the same. But the expectations and feelings are different. Here we can learn from sport psychology. As Markus remarked, "*No-one makes you feel.*" Consider how athletes get the right arousal – not too low or too high – for effective performance in competitions. Perhaps, as Markus suggested, we can ask ourselves *how we want to feel today*. And we can adjust our expectations and frame of mind based on evidence and what is more or less likely to happen. Can we use such insights to improve our performance after few weeks at home before our next shift or flight?

But we are likely to face surprises. So now for a second provocative thought: **surprises are the new normal and resilience is in big demand.** Volatile times bring disruptions, interruptions, and setbacks, even for the most successful among us. A lot of people discovered and talk about 'resilience'. At a personal level, this draws from our character, developed from our life experience and the set of core values and attitudes that have emerged, which motivate our efforts to overcome setbacks. Resilience also thrives on community. We are more motivated to pick ourselves up with the support from

others who want us – and our social groups – to thrive. Our community also creates a sort of obligation to others because we need each other. Resilience is manifested in goals that take attention away of the past and create excitement about the future, and actions that help us meet these goals. This has become clearer for many of us today in our personal and professional lives. This is why resilience is in big demand when surprises are the new normal.

In the context of these provocative thoughts, we need to think about how the work-life balance will look after the pandemic. As if being a working parent didn't already include enough moving pieces to manage, even our kids are now having teleconferences and our toddlers need their tablets to make it through the day. For my family, there are moments when I am working from home when we need five or more devices online to keep with our work from home and school from home. Many online conference calls are early in the morning or late at night to accommodate people from different continents. In this respect, I am somehow privileged. Since the tail of the first wave of the COVID-19 pandemic, I have remained mostly at the work office, and I feel again that the new reality is the old reality.

WELCOME

WORD

But the crisis has pushed work and home lives under the same roof for many families and the struggle to manage it all is now visible to peers and bosses. Here we have two schools of thought: some love it and praise the staff that worked the extra mile from home, and some hate WFH and thinks the staff is on a perpetual holiday. Either way, I hope that one major shift will be a move away from the harmful assumption that a 24/7 work culture works well for anyone.

During this pandemic, employers are seeing that workers can't function well without accommodation for their family responsibilities. Will that lesson last after the crisis is over? Our families want greater choices in determining how their work and their families fit together. Post-pandemic, can we create a system that fits real workers, not just idealised ones? If so, we have the opportunity to emerge from this crisis with both healthier employees and better performing organisations.

Surprises and disruption will be the norm and we will need to adapt and be resilient. The people who will thrive after crisis are those who have accepted the reality, found meaning in these terrible times and use their "skill bricolage" to improvise with that we have. The experts advise that you may bounce back with one or two traits

above, but you will be resilient only of you possess all three.

For us in aviation, I tend to agree with Markus Flemming – in the aftermath of COVID19, crisis will rely on mental skills and resilience, not just our technical skills. I came across the following in an article by Diane Coutu, 'How Resilience Works' in the *Harvard Business Review*:

"Meaning can be elusive, and just because you found it once doesn't mean you'll keep it or find it again. Consider Aleksandr Solzhenitsyn, who survived the war against the Nazis, imprisonment in the gulag, and cancer. Yet when he moved to a farm in peaceful, safe Vermont, he could not cope with the "infantile West." He was unable to discern any real meaning in what he felt to be the destructive and irresponsible freedom of the West. Upset by his critics, he withdrew into his farmhouse, behind a locked fence, seldom to be seen in public. In 1994, a bitter man, Solzhenitsyn moved back to Russia."

This edition of *HindSight*, in my opinion, is a necessary read because it brings important insights and lessons learned from the pandemic in aviation and elsewhere. My personal thanks to all authors, contributors and to our Editor-in-Chief, Steven Shorrock. Enjoy the reading. ⑤

Welcome to issue 32 of EUROCONTROL's *HindSight* magazine, the magazine on human and organisational factors in operations, in air traffic management and beyond.

This issue concerns 'the new reality' that we are facing. It includes a wide variety of articles from front-line staff and specialists in safety, human factors, psychology, aeromedical, and human and organisational performance in aviation. There are also insights from healthcare, shipping, rail, community development and psychotherapy. The articles reflect how many stakeholders have adjusted and adapted, and the implications of the new reality, for individuals, operational teams, support teams, management, organisations (including operators and service providers), regulators, and intergovernmental aviation organisations.

What is clear is that the pandemic has affected everyone. The importance of resilience for individuals, groups, organisations and whole sectors has become more apparent than ever, along with the need for mutual support to get through the crisis.

We hope that the articles trigger conversations among readers. Do your operational and non-operational colleagues know about *HindSight*? Would you be willing to ask them, and encourage them to subscribe? Search 'SKYbrary HindSight' for details.

The next issue of *HindSight* will be on the theme of 'digitalisation and human performance'. What are the implications of this for the work of you and your colleagues, and your organisation? Let us know, in a few words or more, for Issue 33 of *HindSight* magazine.

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CONTACT US

HindSight is a magazine on human and organisational factors in operations, in air traffic management and beyond. The success of this publication depends on you. Please tell us what you think. And even more important, please share your experiences with us. We would especially like to hear from current controllers and professional pilots (the main readership) with a talent for writing engaging articles.

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Martin Rolfe
CEO NATS

INVITED FOREWORD: NATS

This has been a year like no other for aviation across the globe. I never expected in my lifetime to see pictures of parked aircraft and empty airports, or international travel being made illegal.

Traffic levels are still around 75% down on 2019 and industry forecasts for a full recovery vary from two to five years, so the uncertainty continues. In March, NATS recorded its first day of zero westbound North Atlantic tracks for the first time in decades, and international aviation has been pretty much shut down for over a year.

A degree of recovery was expected this summer and we committed to our customers that our operation would be ready to handle much more normal levels of traffic. While the Government's "traffic lights" system hasn't offered travellers many options up to now, it has now added "green watch" destinations and there is hope that "double vaccers" may be spared quarantine later in the summer, which gives the industry hope that the critical summer season may yet come good, albeit much later than usual.

Despite the ongoing impact of the pandemic on our industry, there is much to be optimistic about, and there has never been a better time to recalibrate and change our collective mindset to do things differently in the future. I'm very clear that as demands change, so must our response. More than ever, now is the time for our industry to find new ways of working and dispense with old habits. New answers need a new mindset, especially to address the environmental challenge, so that we can build in solutions as traffic returns.

Over the past year, the decline in air traffic has meant that NATS had no delay and exceeded its environmental performance targets. As traffic returns that will be tougher to maintain, but sustainability has become a key focus of the global industry restart. The UK government has announced that decarbonising aviation is a top priority and the UK aviation industry has committed to reach net zero emissions by 2050.

As part of our net zero aspirations, we need to find new and sustainable ways of managing our airspace. Modernising airspace remains our top investment priority because our customers know the benefits it can deliver – and while traffic levels are depressed, it is a good time for us to crack on with network-level change. The ultimate objective is to simplify the way aircraft can navigate congested lower airspace, reducing the need for tactical air traffic control interventions, and in less congested upper airspace, giving pilots the freedom to plan their own routes and only put in constraints when necessary for safety.

There are many new technologies and tools coming through that will help deliver these projects. But the future will bring new users like drones, super-fast jets, even space travel, which requires us as an industry to think differently. It also requires ATM service providers such as NATS to be willing to explore beyond the traditional stereotypes of what we're there to do. Our legislators and regulators too, must be able to keep pace – real pace – with these developments. They have to be able to see what's coming, and be prepared, so that innovation is not held back. Regulation will be necessary, but it must be timely, and as light touch as possible.

It is as an industry working collaboratively together that we will find the best means of making the real difference to our future. ↗

SKYclips

SKYclips are a growing collection of short animations of around two minutes duration which focus on a single safety topic in aviation. Created by the industry for the industry, they contain important messages to pilots and air traffic controllers with tools for safe operations.

There are SKYclips on the following topics

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- Airspace infringement and aeronautical information
- Callsign confusion
- Changing runways
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- Controller blind spot
- CPDLC
- Emergency Frequency
- En-route Wake Turbulence
- Helicopter somatogravic illusions
- Immediate departure
- In-flight fire
- Level busts

- Low level go around
- Low visibility takeoff
- Mountain waves
- Pilot fatigue
- Readback-hearback
- Runway occupied medium term
- Sensory illusions
- Shortcuts and unstable approaches
- Speed control for final approach
- Startle Effect
- Stopbars
- TCAS - Always follow the RA
- TCAS RA High Vertical Rate
- Unexpected Traffic in the Sector
- Workload Management

Each SKYclip is developed by aviation professionals from a variety of operational, technical, and safety backgrounds.
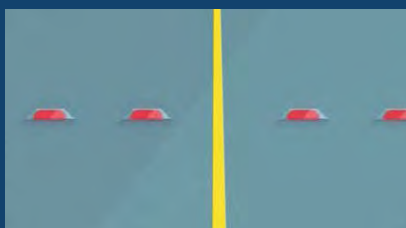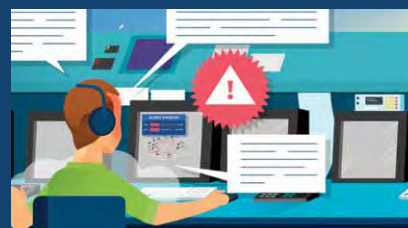
Changing runways

Low level go around

CPDLC

Mountain Waves

Stopbars

Unexpected Traffic in the Sector

Find the SKYclips on SKYbrary at www.skybrary.aero/index.php/Solutions:SKYclips

Steven Shorrock
Editor in Chief of HindSight

NAVIGATING THE NEW REALITY

"Everything changes and nothing stands still." So said Greek philosopher Heraclitus of Ephesus, who often emphasised the reality of change. While we sometimes talk about the 'new normal', the only thing that is normal is change. Some changes are, of course, more noticeable and impactful than others, and change occurs differently over time. COVID-19 has made that obvious.

In many ways, operational work is much like it was before. But the contexts of work – the political and the societal, the social and personal, the legal and regulatory, the technological and the informational – are very different. They are characterised by more volatility, uncertainty, and ambiguity, with major changes to jobs and industries. This will continue at greater pace.

Whole fields of study, such as 'resilience engineering' (related to systems theory and complexity science), have emerged over the decades to address this, but at a practical level these disciplines often aim at designers and decision makers at senior levels. Meanwhile, 'resilience training' at an individual level became a focus of some organisations. In some sectors, the term 'resilience' has become tarnished because of the implication that staff should simply adapt, without higher-level intervention to improve system resilience. My own view is that the need to adapt and adjust is a reality at all levels – societies, governments, organisations, communities, groups, and individuals. Ultimately, especially as individuals and groups, *we have to*. We can't count on the cavalry arriving, nor

that it will act in the right way for us if it does arrive.

So how might we navigate the new reality? The following five practices are important in adjusting and adapting, and are supported by research on resilience and growth.

1. Work on Acceptance

The importance of acceptance has become increasingly important in psychology, but there's nothing new about it. It has been documented since the birth of Buddhism and has long been known to be central to personal change, such as recovery from addiction. This requires that we perceive our situation as accurately as possible, understand what's going on (including the implications), then distinguish which aspects of our situation are within our power to change, and which aspects are not. Acceptance is not passive resignation, but an active process of noticing, acknowledging, contemplating, feeling, and appreciating. Acceptance is a basis for preparing, then continually adjusting or responding (or not) in a way that will improve the overall situation. In other words, acceptance is a basis for learning from experience.

2. Practise Openness to Experience

'Openness to experience' is one of the 'big five' personality traits known in psychology. People who score highly on this trait tend to be curious, creative and imaginative, able to see

things differently and from different perspectives. They are also more attentive to feelings, enjoy variety, and are able to tolerate ambiguity. Not surprisingly, then, this trait helps to adapt and thrive in the face of change. This being a personality trait, you may think it is fixed, but it is not. Personality *can* be changed, under three conditions: 1. willingness and intention to change behaviour; 2. a belief that one can make the behavioural adjustments required to support a change in personality; and 3) persistence with behavioural changes until they become habitual (Jarrett, 2021). Note the word *behaviour*. Research suggests that openness to experience can be enhanced by cultural activities, reading different books, learning an instrument, taking up a new hobby, and – perhaps surprisingly – developing a more active lifestyle and paying more attention to the natural and built environment.

3. Diversify Your Learning

A retired police inspector friend once described to me some typical responses of his officers in personal development reviews. To paraphrase, those who were highly developed in terms of investigation skills wanted to develop further in this same area. Those who were highly developed in a physical capacity wanted to develop further in this area. In professions requiring very technical and procedural knowledge and skills, it is tempting to specialise as much as possible, getting better at what we are already very good at. This brings a feeling of competency and satisfaction…so long as these

competencies are in demand. The problem arises when the context of work changes and you need a different and more diverse skill set. Some people, however, continually develop new skills and areas of knowledge. As Richard Champion de Crespigny, Captain of QF32, remarked in *HindSight* 29, *"We must commit to a lifetime of learning. You must never stop learning."* I find that this is most noticeable in healthcare, where doctors, nurses, paramedics, and other healthcare staff take time to learn about fields that support their practice, and the system as a whole. It can also be seen in aviation professionals. In a rapidly changing world, this means learning and developing knowledge and skills that can be transferred to different situations and environments, even beyond one's own industry.

4. Nurture Relationships and Be of Service to Others

The importance of the team is obvious to operational staff. But thinking more broadly about your circle of family, friends, neighbours and colleagues, who among them can you count on to help you to adjust to new situations, and to grow? They are probably good listeners, encourage you, offer alternative perspectives on a situation, give practical support, or provide a comforting presence. And who would count you in their circle? It's easy to put off the behaviours that nurture relationships: the phone calls, the small notes of thanks and appreciation, the acts of service. It turns out that thoughtfully showing and expressing care and gratitude, and going out of our way to help and support others, strengthens the relationship and eases the burdens on both sides. More generally, research shows that resilience is social, not just personal. Navigating the new reality requires a crew. But who? The answer is not 'like-minded' individuals, but people with diverse interests, knowledge, skills, and perspectives, connected by trust, mutual support, and a sense of community. Collectively, this increases our capacity to meet novel challenges, and is critical in the face of adversity and trauma.

5. Take Care of Your Whole Self

Each of us is more than our job. This seems obvious until we see how much we invest in our work to the expense of wellbeing and self-care. 'Self-care' is a term more common among healthcare professionals than those in other safety-critical industries such as aviation. There are different kinds, some more obvious than others: physical, emotional, psychological, intellectual, social, environmental, financial, and spiritual. The trouble is, as my police inspector friend noted, we often 'specialise', focusing on one or two while closing one eye to the others. Some time spent reflecting on our self-care blindspots,

and searching for ways to meet these needs, will bring far greater benefits.

To go back to Heraclitus on the theme of change, he is also credited with saying that *"No man ever steps in the same river twice, for it is not the same river and he is not the same man"*. The river may seem the same from one day to the next, but the water level, tides and flows, and the relative positions of rocks and branches, will be different. The person may seem the same, but we change over the short and long term, intentionally or otherwise. How we navigate the river certainly needs to change. Navigating the new reality will be easier, and even more fulfilling, if we attend to the practices above. 🖘

Reference

Jarrett, C. (2021). *Be who you want: Unlocking the science of behaviour change*. Little, Brown Book Group.

MAKING IT EASY FOR PEOPLE TO DO THE RIGHT THING

Human performance has always been at the heart of aviation, and understanding human performance is critical. This remains true in the current situation, where demands are quite different for many. But what do we mean by human performance, and how can we best understand it? **Immanuel Barshi** outlines ICAO's newly-published human performance manual.

Regulators are often thought of as only rule makers and enforcers. ICAO, as the source of guidance to all civil aviation regulatory bodies, is adding a special perspective recognising the vital role humans have in all aspects of aviation. The new ICAO *Manual on Human Performance for Regulators* (Doc. 10151) focuses on how regulators can support people in contributing to the aviation system, and guides regulators worldwide to make it easy for people to do the right thing.

To develop the manual, ICAO assembled a human performance task force, bringing together a broad range of human performance expertise. Among the multinational experts participating in the task force were regulators in various roles (ranging from aircraft certification to safety oversight and everything in between). There were participants from airlines, air navigation service providers (ANSPs), aviation intergovernmental organisations (including EUROCONTROL), and aircraft

manufacturers. And there were human factors researchers and practitioners. The product from these experts is a manual which speaks directly to our new reality.

The new reality of the COVID-19 pandemic makes the focus on human performance all the more critical. The machines around us are not affected by the pandemic other than not being used as much, if at all. It's people who are affected. And it's a minority which is directly affected by the virus and is very sick, while everybody is deeply affected by the new reality of social distancing, lockdowns, and tight restrictions on travel and entertainment. Many teleworkers feel that rather than "working from home" they are "living at work". Shining the spotlight on human performance in this new reality is very timely. And although the new ICAO manual is indeed "for regulators", since all of us in aviation are regulated it is good for us to be familiar with its content. What's more, because we

are all human and we all perform, understanding human performance is necessary to make it easy for us to do the right thing.

> "Because we are all human and we all perform, understanding human performance is necessary to make it easy for us to do the right thing"

Human Performance, Systems Thinking and Human-Centred Design

The new ICAO Manual starts off with defining Human Performance (HP) as what people actually do, as the human contribution to system performance. It separates HP from the scientific discipline of Human Factors. From there, it goes on to present

some foundational knowledge about the human contribution to system performance, and on to very specific details of how regulators can integrate an HP perspective in all their regulatory activities. Throughout the manual, the focus is on how to make it easy for people to do the right thing and how to support people so they can perform at their best.
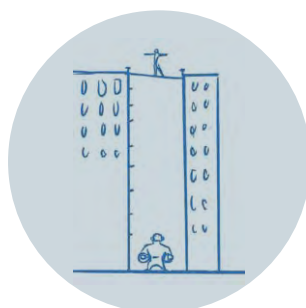
Because HP is about the human contribution to system performance, and because the global aviation system is a complex socio-technical system of systems, the manual lays a foundation of systems thinking (see EUROCONTROL, 2014). It emphasises the need to understand the complexity of the human, the operational environment, and the global aviation system as a whole. Even a minor change in a regulatory requirement in one country, such as a new flight deck procedure, can affect ATM operations on the other side of the globe, as well as ground operations at airports far from home. And because the airspace and the airports are shared, that one minor change made by the regulator of one country can affect all of us. That is the nature of complex systems: a small change in one part of the system can lead to a large change somewhere else.

It's that proverbial butterfly that flaps its wings in one corner of the world that triggers a thunderstorm on the other side of the world. And regulators must consider such effects every time they think of changing something.

Besides being people themselves, and thus equally subject to human capabilities and limitations, everything regulators do involves people. Even when regulatory requirements specify some technical aspects of equipment, the regulations have to be interpreted and implemented by people. Furthermore, safety in the system is created by people, either through their designs or through their actions. And since the goal of all regulatory activity is to enhance safety, putting people at the centre of regulatory considerations is key to safety. Because of that, the new ICAO HP manual introduces human-centred design as a key element in regulatory thinking.

In addition to systems thinking and human-centred design, the new ICAO HP manual introduces five Human Performance Principles. These five principles provide ways to understand and thus support human performance and wellbeing. Understanding these principles and implementing that understanding in regulatory activity enables regulators to make it easy for people in the aviation system to do the right thing.

HP Principle 1. People's performance is shaped by their capabilities and limitations

The first Human Performance Principle states that people's performance is shaped by their capabilities and limitations. It discusses both physical and mental capabilities such as strength and creative thinking, and also some of the limitations. Again, there are

physical limitations like the need for oxygen, food and sleep, and there are cognitive limitations such as forgetting. Human-Centred Design aims to support people's capabilities and compensate for their limitations. Regulatory requirements that are designed that way can do the same.

HP Principle 2. People interpret situations differently and perform in ways that make sense to them

Reminding regulators that people perform in ways that make sense to them and might interpret situations in different ways is the second HP Principle in the ICAO manual. This principle is particularly critical when trying to understand why people act the way they do, and is especially important in safety investigations. It is also central to the design of regulatory requirements that may be clear and unambiguous to the regulator who designed them, but may not be as clear and obvious to the person who has to implement them. Because people generally want to do a good job, it's important to remember that if somebody did something different to what the regulator (or the boss) intended, it's often because that different action made sense to them at the time that they did it.

▶▶

HP Principle 3. People adapt to meet the demands of a complex and dynamic work environment

While interpreting situations, it is important to recognise that people continuously adapt to meet the demands of a complex and dynamic work environment. This is the third HP Principle of the ICAO manual. Adaptation is key to system performance, because procedures are static, and work is dynamic. It is key because task designers cannot foresee all possible situations in which the task may have to be performed (they too are human, and their imagination is also limited; see, Principle 1 above). This adaptation forms the basis of the now well-known difference between work-as-imagined and work-as-done (see *HindSight* 25).

HP Principle 4. People assess risks and make trade-offs

HindSight 17 focused on safety vs. cost. *HindSight* 29 dealt with goal conflicts and trade-offs. It's as if the Editorial Board of *HindSight* read an early draft of the fourth HP Principle which states that people assess risk and make trade-offs. This statement will come to you as no surprise, but it is an important reminder to us all that what we consider as risky may be different from what somebody else, for instance the regulator or the boss, would consider as risky. For some, the risk of modifying a procedure might be smaller than the risk of being late. Perhaps the threat of being judged by peers is greater than a disciplinary threat. And we are always faced with conflicting goals and so must negotiate trade-offs. This negotiation is the result of our risk assessment. There is no way around it.

HP Principle 5. People's performance is influenced by working with other people, with technology, and the environment

The fifth HP Principle in the ICAO manual deals with the ways in which people's performance is influenced by working with other people, by working with technology, and by working in a particular environment. Regulatory requirements have to be implemented in crews or teams, in working with technology, and always in the work environment. Understanding the ways in which these interactions influence human performance is key to establishing and enforcing good regulations that indeed support people in doing their best.

These five HP Principles, together with the concepts of systems thinking and human-centred design, form the foundation to integrating human performance considerations in regulatory action. The new ICAO *Manual on Human Performance for Regulators* lays that foundation and then details its implications for a variety of regulatory activities, including: the establishment of regulations and regulatory material; collecting and analysing data; evaluating and approving equipment, organisations, management systems, procedures and training programmes; and providing ongoing surveillance. In so doing, it enables regulators everywhere to make it easy for people to do the right thing. And the manual is relevant to us all, no matter what part we play in the global aviation system. Especially as we adapt to the new reality, we should keep human performance considerations in mind in everything that we do. S

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Dr. Immanuel Barshi is a Senior Principal Investigator in the Human Systems Integration Division at NASA Ames Research Center. He studies the skilled performance of astronauts and pilots, mission controllers and air traffic controllers, their ability to manage challenging situations, and their vulnerability to error. He holds Airline Transport Pilot certificate with A320, A330, B737, and CE500 Type Ratings, and is a certified flight instructor for airplanes and helicopters.
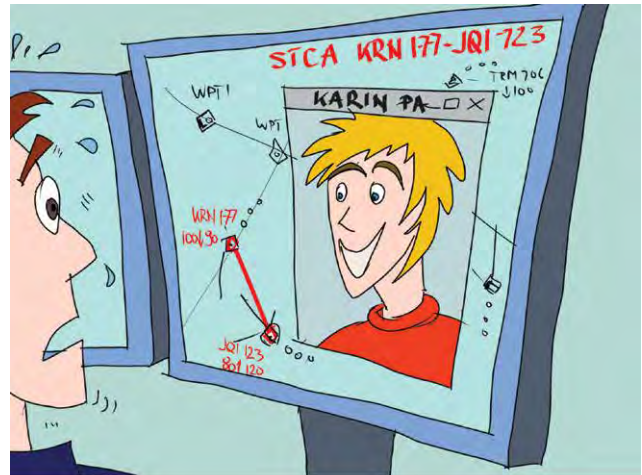
"Welcome back!"

"How is the new roster going, Captain?"

"We thought it was time to return to the old methods"

"Hi, I'm Karim, your personal digital assistant here to help you"

"As you can see in the advertisement, the job is in a remote tower, not a digital remote tower"

"This is your Captain. Welcome aboard. Today, is the first flight with our new flying from home concept."

A GLOBAL AEROMEDICAL PERSPECTIVE ON THE NEW REALITY:

AN INTERVIEW WITH ICAO'S ANSA JORDAAN

COVID-19 has brought the sanitary crisis to the forefront of the world of aviation, and with it, many aeromedical implications. **Steven Shorrock** interviewed **Ansa Jordaan**, Chief of ICAO's aeromedical section, to find out how ICAO is helping aviation to navigate the new reality.

Worldwide aviation has experienced the lowest traffic since the 1980s in some countries. Few in aviation have experienced such low demand, and the developments of the last year are new to us all. But some in aviation are experiencing higher workload than ever before. Ansa Jordaan, Chief of ICAO's Aviation Medicine Section is, not surprisingly, one of them. *"I work a minimum of twelve hours a day,"* said Ansa, *"and then some weekends. And people that work with me, they are all the same. More or less every morning, we have 7:00 AM meetings for CAPSCA* [ICAO's programme concerning preventing the transmission of communicable disease in aviation]*, medical certification, or mental health. I have people in the US where it's 4:00 AM for them and they are there, every meeting. The commitment from the industry has been amazing."* It's been like this for a year.

Ansa Jordaan started in the world of military aviation medicine in South Africa, responsible for everything from medical evacuations to reviews of medical records. From there she moved to the South African Civil Aviation Authority, where her duties included developing regulations and protocols for medical certification and operational air ambulances. After a spell of consultancy work, she moved to South African Airways as Medical Director, overseeing medical certification, occupational health and safety, and providing advice to flight operations. HIV was a particular concern, and Ansa's first experience with a major pandemic. *"At that time, HIV was very relevant and very big in South Africa. We got a lot of exposure on the psychological side of things especially."*

The 2008 terrorist attacks in Mumbai triggered the strengthening of support for people in aviation in South Africa. Several South African Airways pilots and cabin crew were in and around a local restaurant when it was attacked. Some crew members were ultimately trapped in their hotel for 36 hours. Ansa led the development of South African Airways' employee assistance programme (EAP).

This and other experience in occupational health and medical evacuation took Ansa to ICAO, where she has worked since 2015. She now leads the CAPSCA programme and develops, promotes and monitors provisions in ICAO's regulatory documents concerning medical issues and the prevention and management of public health events.

ICAO Aeromedical Activities

When it comes to managing health risks triggered by communicable diseases, communication and coordination is critical. This is not only between States, but first internally within a State, specifically including the national department of public health, aviation authorities (particularly medical departments) and other relevant national authorities. Then there are airports, airlines and other aviation service operators, and the media. ICAO works at an international level, along with the World Health Organization (WHO), to develop such communication links. Regional networks of experts in various stakeholder organisations have opened another CAPSCA road toward global harmonisation in aviation.

Article 14 of the 1944 Convention on International Civil Aviation (the 'Chicago Convention') obliges Contracting States *"to take effective measures to prevent the spread by means of air navigation of cholera, typhus (epidemic), smallpox, yellow fever, plague, and such other communicable diseases as the Contracting States shall from time to time decide to designate"*. ICAO has a central role in helping these 193 countries to coordinate their national efforts to mitigate the spread of communicable diseases such as COVID-19 in the air transport sector, and to help them manage associated risks. Supported by experts like Ansa in the ICAO Secretariat, countries work through the UN aviation agency to develop and agree on international standards, recommendations and guidance materials, and capacity-building helps to put them into practice. Mental wellbeing along with alcohol and drug support programmes are the focus of current medical standards development.

"To ensure the most effective management of risk and public confidence, States should ideally have approaches that are proportionate to risk and broadly harmonised"

CAPSCA – Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation

Established in 2006, CAPSCA is a voluntary cross-sectorial, multi-organisational collaboration programme managed by the International Civil Aviation Organization (ICAO) with support from the World Health Organization (WHO). It brings together international, regional, national and local organisations to combine efforts to improve preparedness planning and response to public health events that affect the aviation sector. CAPSCA aims to ensure collaboration between the aviation and public health sectors, facilitating safe and economically viable air transport while contributing to public health protection. Currently, 156 ICAO Member States and five territories are Members of CAPSCA, and there is a range of partners, including UN agencies, international organisations, foundations and associations representing aviation.

Adapted from https://www.icao.int/safety/CAPSCA/Pages/default.aspx

CART – Council Aviation Recovery Task Force

The ICAO Council's Aviation Recovery Task Force (CART) is composed of government, industry, and international and regional organization representatives, and works to provide practical, aligned guidance for governments and industry operators in order to restart the international air transport sector and recover from the impacts of COVID-19 on a coordinated global basis. The CART's work on its 'Recovery Report' and the accompanying 'Take-Off' guidance for international aviation, has kept the health, safety, and security of the travelling public of paramount concern throughout. The CART has completed three phases, with Phase one providing key recommendations and 'Take-off' guidance on Public Health Risk Mitigation Measures, in addition to four operational modules relating to airports, aircraft, crew and cargo. Phase two prioritized new recommendations on testing and cross-border risk management, and Phase three targets specific issues related to a State's multilayer risk management strategy.

Adapted from https://www.icao.int/covid/cart/Pages/CART-Take-off.aspx

Public health corridor iPack

iPacks are intended to support States' COVID-19 implementation activities and support States in their aviation restart, recovery and resilience efforts. An iPack is intended to be a self-contained package composed of the relevant guidance material, standardized training, tools, subject matter expertise, and guidance for procurement. iPacks includes aspects related to public health-related measures, facilitation and aviation security, aviation safety (e.g., management of temporary regulatory alleviations), risk management, and air transport and economics. Five iPacks are currently available, with more planned for release.

Adapted from https://www.icao.int/secretariat/TechnicalCooperation/Pages/iPACK.aspx

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Vaccination in progress

"We're traveling to places that don't have vaccines yet, and the quicker we vaccinate, the fewer mutations we'll have, the fewer problems we'll have"

From an aviation perspective, preparedness planning is key to managing disease outbreaks.

As an international industry, timely coordination and proportionate responses from national public health authorities and aviation stakeholders are essential. To ensure the most effective management of risk and public confidence, States should ideally have approaches that are proportionate to risk and broadly harmonised.

While the medical department of ICAO and national aviation regulatory authorities are primarily concerned with the medical fitness of licence holders (pilots and air traffic controllers), both are a critical link between public health and aviation. From an ICAO perspective, a number of initiatives are critical in this regard, and Ansa and her team are involved in many of them (see box text for further explanation).

Testing and Vaccination

Testing and vaccination are critical for the reopening of aviation, Meanwhile, flight crew and other aviation workers are exposed in a way that the general public are not. *"We're traveling to places that don't have vaccines yet,"* Ansa said, *"and the quicker we vaccinate, the fewer mutations we'll have, the fewer problems we'll have."* The WHO

has provided recommendations to States on the priority of vaccination. Transportation workers are included in the recommendations of the Strategic Advisory Group of Experts on Immunization (SAGE) III group, as essential workers, but it's up to the States to decide vaccination priorities.

Certification for testing and vaccination is a controversial topic in many countries, but a practical reality for international travel. And being an international business, harmonisation and interoperability are currently hot topics, along with accessibility, usability and security of testing certificates. *"How do we ensure the verification and trustworthiness of those certificates?"*, Ansa questioned. *"There have been a number of fraudulent test certificates, and we expect we will get the fraudulent vaccination certificates."*

ICAO is putting together standards on how to prevent fraudulent actions and how to harmonise standards. This is not straightforward. *"With the vaccination, it's more difficult because it's under the WHO umbrella and not under the aviation umbrella. We foresee that it will play a big role for aviation. And we need to be ready."*

There are currently several travel passes, including IATA's Travel Pass, the World Economic Forum's Common Pass and

the European Union's Digital Green Pass. ICAO collaborates with the WHO, and a multidisciplinary working group comprising different specialists from all over the world, including other intergovernmental organisations. Evidence of vaccination must be currently in accordance with national legislation and national practices. Different stakeholders must be able to exchange and verify information, and passes must be interoperable with various platforms.

The situation is volatile, uncertain, complex and ambiguous, and while medical specialists can give the best advice based on evidence, in this case the evidence changes along with understanding of the pandemic. Then there are the politics and national interests. *"It's a very dynamic situation with the variants and testing and the vaccines. So all of that is already difficult enough in terms of advice, but then you get the political side of it on vaccine priorities and availability."*

"While medical specialists can give the best advice based on evidence, in this case the evidence changes along with understanding of the pandemic"

Medical Certification

Different States have been giving operators different extensions regarding the validity of licences and certificates, including medical certifications during the pandemic. I wondered if this is something that will be extended past the pandemic. And what is the rationale for differences compared to before, and between different States? Ansa explained that *"what we had initially was alleviations – extensions to medical certificates. We provided a quick reference guide to the States on how they can extend medical certificates. That's all based on a risk assessment process. There were certain certificates which we said do not extend, and there were others that could be extended. So, for example, right at the beginning, we said prioritise emergency and evacuation flights. It was also dependent on the capacity and availability of the medical examiners, because they were also helping with COVID prevention and treatment."*

In some States, medical examiners were not available, which might account for the differences between States. ICAO provided the guidance on risk assessment for extensions, but there was a sunset date which expired on March 31st. Ansa explained that *"we had the Council decision, and that system will be replaced by targeted alleviations. These are narrower in scope and more restrictive because, for us, it was a concern to keep on extending medical certificates."* With targeted alleviation, ICAO has a template that States can follow, with specific guidance on how to do aviation medical examinations, and an overall objective to get back to normal operations.

Face-to-face medical examinations are required for new applicants and licence holders that are considered to be of higher risk in terms of the medical restrictions. *"For the rest,"* Ansa noted, *"we're saying that you have to do a risk assessment to decide whether you can do alternative types of examinations. And for that we provide guidance. So we say look at which class it is. Look at each type of operation. Is it multi-pilot, single pilot? Look at the previous reports that he or she needed to submit. Is it a high risk or low-risk type of medical condition?"* ICAO offers advice on mitigation factors

for targeted medical examinations if there is not face-to-face access to an aviation medical examiner (AME). *"If you're required to have your eyes tested, or you need an ECG or lung function test, or if you've had an injury and you need a new report, then you can do that targeted examination, which could be done by someone who is not an aviation medical examiner."* The report would need to be sent to the AME for review and certification.

Telemedicine has become more common because of COVID-19, including in aviation. There are specific requirements if a person's condition has changed. The licence holder first needs to call their AME. Then the AME will decide if he or she can renew the licence based on that discussion, or arrange a one-to-one consultation.

This arrangement has been implemented in some states. While there are best practices, it is a risk-based approach based on the expertise of the AME. *"We're not going to let a high-risk person fly if we haven't done an examination or have just done a telephone call."*

The last option is health declarations in certain circumstances. In this case, there are specific requirements. ICAO encourages States to only allow this for low-risk situations. This also still needs to be sent to the AME and has to go to the state medical assessor in charge of aviation medical certification in the national State department.

While there are a variety of options and some may be retained, Ansa said that ICAO would like to see a return to face-to-face consultations as soon as possible.

Mental Health and Wellbeing

Mental health and wellbeing have come into sharp focus as the pandemic has progressed. Ansa noted that front-line aviation staff are subject to the same kinds of worries shared by most people – about loved ones, about exposure and getting sick, and about access to vaccinations. *"You don't know what's going on and you just see more people getting sick. I think it's the degree of uncertainty. That is the big problem from*

the studies." Then, there are additional stresses about protective measures that staff have to perform, such as disinfecting surfaces and wearing face coverings.

For flight crews, the stresses can mount up further still. *"In some cases, they have dedicated ground transport to their hotel, and when they get to the hotel, they may be locked in their room. They can't necessarily go out and exercise. Some are delivered meals in their rooms with no choice of what to eat. So there is the added stress of being subjected to quarantine with uncertain conditions. And sometimes it changes from take-off to landing. Unpredictability and isolation create problems."*

"With pilots flying less often and controllers controlling less often, self-confidence can take a hit, with the added fear of loss of license and livelihood"

With pilots flying less often and controllers controlling less often, self-confidence can take a hit, with the added fear of loss of license and livelihood. *"A lot of people have been furloughed or made redundant because the airline closed down or they couldn't continue paying staff anymore. This is an abnormal situation and to be anxious and to be fearful is a normal reaction."* ICAO issued an electronic bulletin to address all stakeholders in the industry to ask everybody to work together. Ansa acknowledged the importance of psychological safety: *"Pilots and controllers might not disclose medical information if they're afraid they're going to lose their licence, especially now because of the economy. That's been a major discussion that we've been having. It is essential that all aviation stakeholders provide as far as possible a safe psychosocial environment to aviation employees."*

Return to operations becomes the next issue. *"How do you engage everybody back into the working environment*

again? And how do you make sure that there's enough controllers and other aviation personnel to ensure safe and smooth operations? There are a lot of uncertainties that need to be addressed."

Organisational and Individual Interventions

Several interventions are possible at different levels, from States to individuals. I asked Ansa about what would be at the forefront of her mind for aviation authorities and organisations. Her suggestions all concerned supporting people. *"We ask aviation authorities to engage with aviation personnel, to talk to them, reassure them, and provide resources. It's vital to help pilots, ATCOs, cabin crew, maintenance personnel and others to cope with the changes, perhaps through employee assistance programmes or peer support programmes. If people are furloughed or laid off, how can organisations continue providing support programmes to those people?"*

For organisations and management, Ansa's thoughts continued along these lines. Ansa would advise an organisation's senior management to undergo training on how to deal with someone who is stressed or someone who is struggling to cope. *"There's so much more stress involved because of everything that's happening. It's important not to be too demanding. Managers need to be aware of the signs – people making more mistakes, starting to isolate themselves, and so on. Often, issues arise from misunderstanding or miscommunication. If you're open and really listen, you can better support people. If you just go through the motions and do the box ticking, that's going to do more harm than good."*

"For me, peer support is really the first line in defence because it's your colleagues. They know the circumstances from a work perspective, they understand the work and the demands"

From here, Ansa suggested that organisations make available tools and advice to support people. *"Even if you don't have an EAP, you can still guide people towards how to keep healthy, and where to go for assistance, perhaps via newsletters, for instance."*

Then there are interventions for individuals, peers and small groups. Again, Ansa had some useful suggestions. *"One is social contact. That's the number one thing. Whatever problems people have, just reach out. People tend to isolate, and that just makes things worse. So we need to reach out to our colleagues, friends, or family. Remember that you're not alone. Don't feel isolated. Go and seek assistance."*

For some in larger organisations especially, Ansa suggested reaching out to the peer support programmes. *"For me, peer support is really the first line in defence because it's your colleagues. They know the circumstances from a work perspective, they understand the work and the demands. And they have been trained, and often have experienced very stressful life events themselves. If they feel that you need more assistance than they can give you, then they can refer you to the appropriate person."*

A good relationship with an AME is also helpful. AMEs, she noted, have been trying to get a better position of trust with the pilot or the controller. *"We're really trying to help you to continue working."*

Then there is having a healthy lifestyle – a basic but easily overlooked factor. *"This includes a proper diet, not drinking too much, enough sleep, and trying to manage stress. It's things like getting out in nature, doing a hobby – something that is nice for you, and that relaxes you."* On that note, Ansa suggests mindfulness exercises: *"I think we should promote that more."* In 2018, ICAO published a book called *Fitness to Fly*, a preventive-medicine handbook intended to close the gap between pilots' medical requirements to fly and preventive measures that can help them fulfil those requirements.

The Future

I wondered what we might expect post-pandemic, from an aeromedical perspective. What kind of opportunities might emerge? Will aeromedical practices change, or will things return to how they were before? *"Many things might, to a degree continue post-pandemic, but we will need to have very clear guidelines in terms of what you can allow in which situation."* Ansa gave an example of the human intervention motivational study (HIMS) programme in the US. HIMS is an occupational substance abuse treatment program dedicated to helping all pilots return to the cockpits, with follow-ups to some patients by remote consultation. *"This has been working very well, but I would not want to do that globally unless we have the training and resources that go with that. We don't have the same experience everywhere."*

ICAO is creating a risk assessment framework that will take into account the various types of examinations and the various tools that are available. *"Going forward, that might be part of our normal set of tools, but it will have to be clearly defined. We will learn from best practices and from what's being applied now."*

Concerning mental health, ICAO is looking at the training of not only AMEs, but also pilots, and specialists that work with peer support groups, so that everybody is better aligned.

There have been other lessons for AMEs. What we might learn, Ansa remarked, is how to be less prescriptive, but more risk-based, taking into account a range of factors, and not just age, for example. *"That is something that we have been discussing in aeromedical circles for a long time: how to do our risk assessment process in line with the type of operation, the type of medical condition, and the probability of becoming impaired while you're flying or while you're controlling. It's not just a normal medical examination that one has to do, but one that we can really differentiate between those things."*

On communicable diseases, Ansa noted that the industry has to learn from experience. *"We have COVID now, and we had SARS and MERS, and Ebola in between. In future we're going to have something else. So it needs to be recognised and prepared for."* One problem may lie in a sort of complacency borne out of a desire to 'return to normal'. *"Everybody jumps around doing something, then when the outbreak is over, organisations often go back to doing just what needs to be done."* Public health departments, she noted, often experience cuts. Thankfully, Ansa noted the continuation of ICAO's CAPSCA programme for preventing the transmission of communicable disease in aviation, and involving more stakeholders. Some States have even provided more budget.

"My hope is that this prolonged pandemic raises awareness of the effect of communicable disease in aviation, how to be better prepared and how to build resilience for that", Ansa said. *"That's really one thing I hope will come out of this."* ꙅ

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Dr Ansa Jordaan joined the International Civil Aviation Organization (ICAO) in October 2015 and is currently the Chief of the Aviation Medicine Section, responsible for aviation medical standards and the CAPSCA programme (preventing transmission of communicable disease by air). She graduated in 1989 as a medical doctor and has two post-graduate degrees (Aerospace Medicine and Occupational Health). In 1999, she established the Aviation Medicine department in the South African Civil Aviation Authority, after having worked in the South African Military Institute of Aviation Medicine. In 2003, she left the CAA and worked as an Independent Consultant in the aviation industry until 2007. She then joined South African Airways where she was the Medical Director until June 2011. After SAA she left the aviation industry to work at the Life Occupational Health Group, where she was the Project Director of Occupational Health for Transnet Freight Rail. In 2012 she returned to aviation and was the Medical Director of Occupational Health at International SOS. She is a member of the Aerospace Medicine Association (AsMA), the International Academy of Aviation and Space Medicine (IAASM), the Airlines Medical Directors Association (AMDA) and provides consultation services to the World Health Organisation (WHO).

THE WAY WE DO THINGS AROUND HERE:
CONVERSATIONS ABOUT NORMS

In aviation and other sectors, there is a concern about professional standards and norms within organisations. After so much time away from normal workplaces and colleagues, how can we talk about departures from good practice – 'the way we do things around here'? **Robert de Boer** explains the practice of norm-conveying conversations.

KEY

- **In returning to business-as-usual, we may need to re-emphasise our sense of standards and norms.**

- **The norm-conveying conversation is a means to this end, useful when we experience a significant gap between standards and reality.**

- **The norm-conveying conversation is a reprimand by a figure of authority without disciplinary consequences.**

- **The norm-conveying conversation is appropriate for a just culture, supports psychological safety and is an important step in restorative practice.**

"The norm-conveying conversation supports a just culture, enabling the freedom to speak up without fear"

Introduction

A long time ago, I held a private pilot's licence. I was allowed lessons by my university at the time as I was studying human-cockpit interaction. I didn't yet have much income, and I flew my friends around Rotterdam for a fee to build airtime until I had none left… friends, that is. I wasn't a particularly good pilot, not spending enough hours in the air and having trouble understanding all the garbled radio talk.

In one of these flights, we executed some low-gravity parabolas over the South of Rotterdam. After landing, I was politely but firmly invited to come to the tower for what turned out to be a *norm-conveying conversation*. In unambiguous terms I was told to never carry out such escapades over the Outer Marker again, certainly not with passenger aircraft making their approaches. I can tell you that the experience (of the reprimand, not the jaunt) made such a lasting impression that I soon chose to try my skills at more earth-bound pastimes.

We are all looking forward to returning to something like business-as-usual, with higher levels of activity and interaction than over the last year. But the lull that we have experienced may have diluted our collective experience and blunted our sense of standards. So it is quite possible that some conversations with peers, pilots and subordinates will be required to rapidly bring us back to speed, quality and safety. These *norm-conveying conversations* convey a standard or norm from a figure of authority to someone who (apparently) needs to be enlightened on this.

The purpose of the talk is twofold: 1) to illustrate the unacceptable gap between what actually happened in a specific case and the applicable standards or norms, and 2) to ensure acknowledgment of the message in the receiver by triggering a feeling of remorse (which is the emotion that we experience when we regret a past action, and which we consider improper in hindsight). In combination, this aims to support the recipient in learning from the event. (Learning, of course, is not just about *knowledge* but also about *caring*.) Norm-conveying conversations

have recently been popularised, for instance in the financial domain: a Dutch regulator has listed it as one of its corrective measures for digressions from sound practice at financial institutions.

To help readers to prepare for and execute these conversations, I volunteer some thoughts derived from my research and practice of progressing safety in aviation and other industries. I will indicate how to effectively conduct one and how it relates to a just culture. But first I will discuss why these talks are actually quite difficult to conduct.

The difficulty of conveying norms

Of course, norm-conveying conversations have been held throughout the ages. They probably didn't need a fancy name in earlier times because they were ubiquitous. Nowadays, however, I am sensing that we are holding back on these conversations:

The Dutch minister for economic affairs was portrayed on television in his limousine without a seat belt. He was being interviewed in the back seat of his car for a current affairs programme and the journalist diligently strapped himself in. The minister indicated with a boyish grin that he often neglected to wear his seat belt when being driven because it was uncomfortable. After broad exposure in the press, several of his fellow ministers indicated that this was irresponsible behaviour. "I am counting on him never to do this again," muttered the minister for traffic and infrastructure Cora van Nieuwenhuizen. "There are still too many casualties in traffic. Lives can be saved by using seatbelts. You should never make jokes about that." Van Nieuwenhuizen continued: "Wearing seatbelts has been mandatory since 1992. Every Dutch person has to comply with the law and a minister should set an example." The minister for economic affairs humbly offered excuses and paid an amount equal to a traffic fine into a trust for traffic safety.

Apparently, the minister's own sense of ethics was insufficient to avert this public disgrace. But worse, and illustrative for the lack of a discussion on norms, none of the people surrounding the minister was able to safeguard

him from this humiliation. Neither his driver, nor the public servants around him, nor his fellow ministers, nor the prime minister, nor even his family called out the physical and reputational risks of not wearing a seat belt. In this example it was only after a journalist spoke up that the minister bettered his ways. Of course, many similar incidents make it into the news (for instance the 425km trip to Durham, England, during lockdown by Dominic Cummings, the UK Prime Minister's Chief Advisor), but many more are kept secluded from the public eye.

In our work on safety with organisations, we often find that a gap between rules and reality has been evident for some time before an incident occurs, associated with personal comfort (as above), production pressure, peer pressure, or culture. In one instance, process operators were required to add their own weight to a bale of product to trigger the conveyer to start, putting limbs in close proximity to moving parts. This happened more or less routinely despite 'the team leader telling people off' until a foot was caught between a lift and the bale, leading to severe injuries. In another case, cranes were driven habitually without the proper permit or adequate training, eventually leading to costly damages.

So why is it so difficult to convey the norms or standards that we expect colleagues to adhere to?

"The norm-conveying conversation supports psychological safety"

Ambiguous organisational structures

Current-day organisations have an inherently more complex structure than before, creating an ambiguity in hierarchy. It is difficult to see the actual work that people do (even more so as they are dispersed and are working virtually). Dotted, full and bold lines abound, making management into what organisational specialists Yves Morieux and Peter Tollman call an 'abstraction'. Morieux and Tollman suggest that the (only) value of

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managers is to make people do what they would not spontaneously do. We may have lost that purpose and that skill, not having been taught how to do that or having access to many examples of good management.

The costs of speaking up

Initiating a norm-conveying conversation is not very attractive due to what Amy Edmondson calls the 'voice-silence asymmetry'. Speaking up does not primarily benefit the speaker, but instead benefits others (the receiver and the wider organisation). These rewards are delayed and there is little certainty that they will be achieved at all. Instead, the speaker can be penalised for speaking up, being seen as bossy or difficult and not adhering to social norms or rocking the boat. Staying silent often seems a much more attractive option.

Reliance on obedience to policies and procedures

Rather than facing the hassle of norm-conveying conversations, it is easier for people in organisations to rely on external references for the quality of their work. Obedience to written rules and compliance against an audit become more important than understanding the work and adhering to logical – if sometimes undocumented – standards. Mind you, when I was amusing myself over the Outer Marker, I was in visual flight rules airspace and not trespassing any official regulations, yet I was still called into the tower.

"The norm-conveying conversation is aligned with restorative practice"

How to do one properly

A norm-conveying conversation is justified if we perceive a significant gap between a standard or a norm and what we see happening, *and* if we are confident that the people involved are not sufficiently aware of this gap or the possible consequences. It is of no

use to state the trivial or the obvious, i.e., if there is already awareness. It is most useful if the triggering event is not too adverse, as the aftermath of a more severe incident is often a melting pot of emotions, blame, litigation and hurt, and it is more difficult to extract learning from it. The transgression is of a 'professional' nature and may or may not be based on rules that are documented. The recipient needs to accept the authority of the speaker for this gap, otherwise all we achieve is irritation (other types of conversation might be appropriate though). The conversation needs to be immediately after the event when memories are fresh, but not until the situation has stabilised (in the case above I was only 'invited' to the tower after landing).

The conversation can be short and crisp, relating only to the gap and the adverse consequences that it might have invoked. The tone of voice matches the severity of the case and needs to be terse enough to invoke remorse, but not more than necessary to start a process of reflection. There is no need to raise voices, threaten or belittle. There is no need to discuss; any excuses that the recipient might volunteer should not be relevant if the case has been well chosen (but can be acknowledged as a step to remorse). If the push-back is valid (for instance because of contextual factors that were relevant), a dialogue ensues but we have digressed from a norm-conveying conversation. We do not take notes, invoke a disciplinary process, or hold a grudge against the individual. If multiple people are involved, we speak to each of them individually.

We have achieved our aims if the recipient understands our objection against the gap that was encountered and its severity, is remorseful about having been involved in it and starts to reflect on the issue. The remorseful emotion not only signals understanding of the significance of the gap but is socially functional and is the starting point for a restoration of trust between the speaker and the recipient.

We cannot be sure that learning takes place; that is the receiver's own responsibility. Note that there will often be unanticipated, emergent

consequences for the rest of the organisation if learning does take place.

In the case of the bales of product being underweight, these are now returned and reworked so that they properly trigger the lifting mechanism, sometimes causing production delays. In the case of the missing crane permits, work is sometimes suspended by a lack of qualified operators. In the long term, these consequences lead to further process improvements, but in the short term they can be costly.

Norm-conveying Conversations in a Just Culture

According to the EUROCONTROL Just Culture Manifesto (see this issue of *HindSight*), *"there must be constant discussion about the right professional behaviour and the consequences when professional boundaries are crossed."* The norm-conveying conversation supports a just culture, enabling the freedom to speak up without fear. The norm-conveying conversation is one of the ways to facilitate this, before moving into the realms of a disciplinary process. Note that the norm-conveying conversation itself is without disciplinary consequences, but the need for a repetition of these talks might inspire a line manager to hold a different type of discussion with the individual. After all, the norm-conveying conversation is only intended for circumstances where those involved are not sufficiently aware of the gap or its consequences, not for recurring cases.

The norm-conveying conversation also supports psychological safety. Learning and high performance are achieved through a combination of psychological safety and setting standards. The norm-conveying conversation is an important teaching instrument and useful to propagate 'productive conflicts'.

Finally, the norm-conveying conversation is aligned with restorative practice, which acknowledges that the trust between actors may have been damaged by the event. The norm-conveying conversation focuses on healing the relations and restoring trust between these, thereby promoting an even higher level of psychological safety.

Conclusion

In this article I have explained the norm-conveying conversation in the expectation that it will facilitate a return to business-as-usual in aviation when perhaps our collective experience has been tempered and our sense of standards has dimmed. I have shown why there might be some hesitancy to invoke these kinds of talks, but that they can be executed fairly easily. They align with a just culture and with psychological safety, and even fortify these. I invite readers to comment on the suggestions above, and to volunteer their own examples of good practices for norm-conveying conversation, or instances where they are lacking. **S**

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Robert J. de Boer PhD is currently the Director of the Amsterdam Campus for Northumbria University. Robert has supported the improvement of safety at many organisations across the globe in aviation and many other industries. His book titled 'Safety Leadership: A different, doable and directed approach to operational improvements' with a foreword by Sidney Dekker was published in Spring 2021 by CRC press.

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SHOULD WE THROW ATM OUT WITH THE BATHWATER?

Air traffic management, as a complex sociotechnical system, remains basically sound and safe. **Anders Ellerstrand** argues that while there is a potential for improvement, we can do this by building on 'the best of what is' – on what already works well.

Through the last months, I have been a regular listener to the amazing EUROCONTROL 'Straight Talks', where aviation industry leaders describe their present situation and their views on the problems they face, and their views on what needs to be done to improve after the pandemic.

During these talks, I sometimes hear a rather negative view on ATM in Europe. ATM is described as a very conservative part of aviation, without the necessary drivers for change. The common 'proof' is that the Single European Sky, more than 20 years after the initiative was approved, is far from materialising. So, what is the problem? Safety is rarely discussed. Instead, the leaders tend to focus on ATM capacity and cost-efficiency.

One of the solutions suggested includes taking away the borders in the airspace. Another example is virtual centres, where the provision of ATS can be located anywhere and moved to create more flexibility. There is also the recurrent hope for technical solutions like automation, digitalisation, and artificial intelligence.

These requests for quick and drastic changes worry me a bit. ATM is a complex socio-technical system that is already constantly adapting and changing, to cope with the variability of air traffic, with competing goals and limited resources. One of the features of a complex system is that it is not fully predictable. When we decide on an action or introduce a change, we cannot be certain of the result. The outcome is not only a result of our actions and implementations. The outcome emerges as a result of the countless interactions in the system.

"Human Factors can be a valuable tool in such a development, as HF is concerned with the understanding and design of interactions between humans and other elements of the system"

David Snowden, a specialist in complexity science applied to organisations and creator of the 'Cynefin' framework (used to aid decision-making) recently wrote on twitter, *"The single most fundamental error of the last three decades is to try and design an idealised future state rather than working the evolutionary potential of the here and now, the adjacent possibles – it is impossible to gain consensus in the former, easier in the latter."* I like the idea of "working the evolutionary potential of the here and now" and a possible approach could be a method called 'appreciative inquiry'. This is a systemic approach aimed at searching for the best in people, their organisations, and the world around as a basis for change and development. Does this sound like gibberish? Is there really a potential in working the evolutionary potential of the here and now? I believe there is.

In five years, from 2014 to 2018, the ATC Centre in Malmö, where I worked as a Watch Supervisor for fifteen years, saw a traffic increase of 14%. From 2017 to 2018 alone the increase was almost 6%. The total number of ATCOs during these five years went from 176 to 177. Yes, the number of hours in position initially increased, but actually decreased from 2017 to 2018, in spite of the big traffic increase. Productivity (flight hours per ATCO hour) also increased. Was this

achieved at the expense of safety or quality? The key safety performance indicator used is yearly separation minima infringements. Those went from six in 2014 to two in 2018. The performance target for the centre was 0,07 min delay per flight for 2014-2017 and 0,06 for 2018. The average actual performance was below 0,02, with 0,03 for the record year of 2018. As a conclusion, the centre managed a traffic increase of 14% in five years, with the same number of ATCOs, and with maintained or improved performance for safety and quality.

A research project tried to find the enablers behind this achievement, through interviews with a sample of the controllers and a survey directed to all ATCOs. The conclusion was that answers can be found by looking at how the workplace is designed. At the sharp end, human factors must be considered when matching the system to the human, and the human to the system. Among the contributing factors mentioned was the trust in colleagues and the good cooperation between the planner and executive controller, making it possible to learn from each other and harmonise working styles. Another factor is the technical system with automation and tools that support but keeps the controller in the loop to help increase capacity while maintaining safety.

There is also a need for an organisation that provides support adapted to the needs at the sharp end. This is facilitated by the fact that a majority of support staff are controllers that maintain a current rating, which supports a good flow of information, feedback, and ideas between the 'blunt' and the 'sharp' end.

This also helps to close the gap between 'work-as-imagined' and 'work-as-done' (see *HindSight* 25). Underpinning factors are professional pride that drive the will to express views and ideas, and psychological safety that makes this possible.

"When we decide on an action or introduce a change, we cannot be certain of the result"

The aviation industry is now hoping and preparing for increasing traffic. Europe saw a big increase in traffic before the pandemic and this time we will probably see an increase to a lower level than we experienced in 2019 but an increase at a faster rate and most likely with traffic following new patterns.

I believe Europe has an ATM solution that is basically sound, and with exceptional safety performance. My story from the Malmö Centre 2014-2018 indicates, however, that there is a possibility to maintain the high levels of safety, while improving capacity

and productivity. Such a development does not require us to discard existing systems. There is instead a significant potential, by searching for 'the best of what is' and by building on that foundation. Human Factors can be a valuable tool in such a development, as HF is concerned with the understanding and design of interactions between humans and other elements of the system, to optimise human well-being and overall system performance. In doing this, there is no need to throw out ATM with the bathwater. ⑤

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Photo Anders Ellerstrand

"Most ANSPs applied for prioritisation in the national vaccination strategies"

VACCINATION STRATEGIES AND ATCO PREPAREDNESS FOR TRAFFIC RECOVERY IN EUROPEAN ANSPS

In recovering from the COVID-19 pandemic, vaccination has become the most critical factor, including for operational ATM staff. Since different states and ANSPs have different strategies, **Stijn de Graaff** asked European ANSPs about their routes out of the crisis.

At the start of 2020, no-one would have imagined the topics of 'vaccination strategies' and 'preparing air traffic controllers for high traffic loads after a long period of decreased traffic' as two of the top priorities for air navigation service providers (ANSPs). But the health and performance of controllers have become fundamental to safe and effective operations, and vaccination remains key to emerging from the crisis. Still, this raises many questions. To get a view of the different strategies and actions among different ANSPs, two short surveys were conducted with a group of European ANSPs in March 2021.

When do ANSPs expect air traffic controllers (ATCOs) and air traffic safety electronic personnel (ATSEPs) to be offered COVID19 vaccination?

To start with the vaccination survey, out of the 23 responding European ANSPs, two reported that the vaccination programme for their staff had already commenced. The rest of the responses varied from the beginning of spring to the end of the summer 2021. The availability of vaccines and different government strategies make it difficult to determine a fixed date. This is raising concerns in some ANSPs, as traffic levels are expected to rise in the coming

months and social distancing measures make it difficult to operate Ops rooms at full capacity.

Do national vaccination strategies prioritise ATCOs and ATSEPs?

To enable the best possible continuation of operations, and in line with the recommendations from international organisations like the International Air Transport Association (IATA) and the World Health Organization's Strategic Advisory Group of Experts on Immunisation (SAGE), most ANSPs applied for prioritisation in the national vaccination strategies. Being labelled as part of critical

infrastructure or an essential workers category, 12 ANSPs confirmed they will be prioritised as essential infrastructure workers. The level of priority, and starting date of vaccinations, differ per state. At the time of writing, eight ANSPs are still waiting for a response from the government to their request.

Are there any restrictions on ATCO and ATSEP activities immediately after the vaccination, and what are the impacts on rostering?

Another impact of the vaccination campaign is the possible side effects of the vaccine to the person receiving it. Some of the ANSPs therefore implemented a rule to not undertake safety-related tasks after the vaccination (12 to 48 hours). There was no official recommendation to do so at the time of the survey. Recently, EASA and EUROCONTROL jointly issued operational recommendations in relation to the vaccination of ATCOs and other operational staff. One of the recommendations specifically addresses the resting period after vaccination: *"ATCOs and the ANSPs should consider a waiting period of 48 hours after each dose of COVID-19 vaccine, before the ATCO should be engaged in any operational related tasks in accordance with the privileges of their licence."* The potential impact on the roster, if a similar rule is implemented, is variable among the responding ANSPs. The current low traffic situation provides some with more flexibility in the roster, but others expect a high impact, especially if ATCOs and ATSEPs would be called for vaccination in groups.

Are ANSPs allowed to ask staff if they are vaccinated? Is there any requirement for ATCOs and ATSEPs to be vaccinated?

The final question of this survey was about the possibility, according GDPR or local law, to ask staff if they are vaccinated. Overall, the answers indicated that there was no legal ground to ask this question, so it would not be posed. Where the question may be asked, the staff is not obliged to answer. This makes it difficult for

the ANSP to determine the level of vaccinated staff, which could be of interest before deciding to release COVID measures in the workplace.

How do ANSPs intend to address possible skill fade among operational staff?

The reduction in traffic and, in some ANSPs furloughed ATCOs, has created a challenge in terms of controller confidence and deskilling. The second survey focused on these topics. The results of the 21 survey responses show a variety of actions taken to minimise and mitigate the operational risks and effects.

Overall, increased simulator-training with high traffic levels and complexity is the most common strategy to ensure sufficient skills for increasing traffic. In some ANSPs this is combined with additional theoretical training modules and communication campaigns to increase awareness on the risks of sudden traffic increases. In addition to these training-related items, there are some measures concerning live traffic.

Three ANSPs put in place a procedure that allows them to reduce sector capacity when the traffic levels rise above a certain percentage of the expected traffic. Increased supervision of the Ops room is put in place to support the controllers and provide extra eyes and ears for safe operations. These measures will be activated when the traffic rises. Another option employed is opening more sectors than needed with the current traffic levels. One of the ANSPs wants to provide continuous exposure to coordination procedures and agreements for its controllers.

Several impediments affect the implementation of these measures. The COVID-19 measures that have been put in place by different governments and ANSPs make it difficult to operate simulators at normal capacity. Cleaning schedules, social distancing and restrictions of non-operational staff to the ANSP premises limit simulator operations and have a direct impact on maintaining ATCO competency.

"The COVID-19 measures that have been put in place by different governments and ANSPs make it difficult to operate simulators at normal capacity"

Another challenge is the difference in individual training needs for controllers. The impact of a longer period of low traffic on an ATCO's confidence and competency differs per person. To fit in these individual training needs in a program for all ATCOs is difficult, and these needs may change or appear during the training sessions.

The final question of this survey concerned the deskilling of other operational staff like ATSEPs and flight information service officers (FISOs). As the impact of the COVID-19 pandemic was mainly on commercial traffic, FISOs have not been so severely affected by the traffic decrease. For ATSEPs, the impact is even less because all systems still needed to be operational, and there is no significant link between the workload and amount of traffic for this category of operational staff.

Conclusion

The two surveys provided a valuable insight into the new reality of managing safe operations in ATM over the past year or so, and the months ahead. The experiences that ANSPs have gained and exchanged during this crisis will help the transition towards more resilience and flexibility in long-lasting traffic dips and times of crisis. ⑤
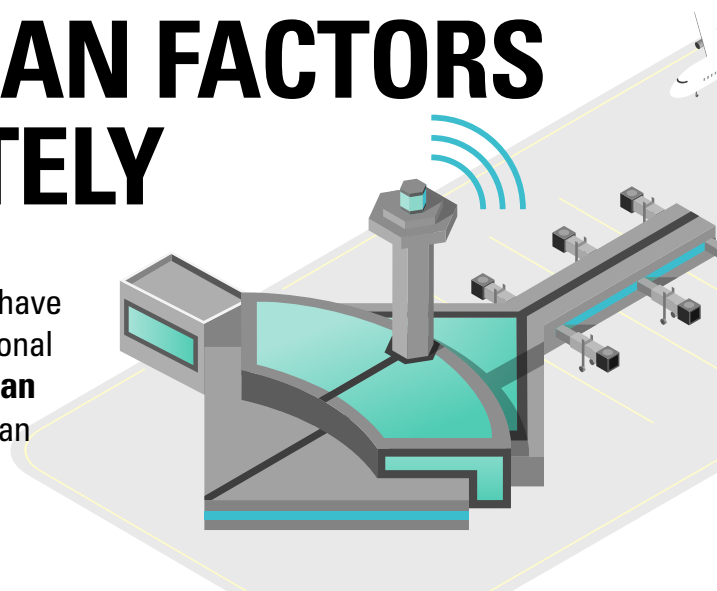
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THE DAY THAT TURNED INTO A YEAR:

LESSONS LEARNT FROM PROVIDING HUMAN FACTORS SUPPORT REMOTELY

With changes to air traffic controller working patterns have come changes for those who support effective operational performance. In this article, **Courtney Jaeger** and **Rhian Williams-Skingley** give an insight into providing human factors support at NATS in the new reality.

After what started as a 'test day' to see if employees could work from home, a year later we find ourselves having adjusted to a 'new norm'. As the day turned into weeks and months, it soon became apparent that it was more than the IT that needed to be considered in remote working. As human factors specialists, we couldn't support the operation in the same way we always had. We felt set apart from the operation, both physically and psychologically. This is the story of how we learnt and adapted to ensure that we continued to provide support to the operation.

New Territory

We are all experiencing the pandemic in different ways, with uncertainties and unknowns dominating our thought processes. We placed a heavy reliance on our contacts and networks within the operation early on to build a picture of what we could do to help, all while managing our own worries and concerns.

Initially we found ourselves reacting to the new operational working environment, which was changing daily. We published safety notices and provided information by email and the intranet system, which highlighted emerging risks and how to effectively

manage the traffic situation from a human performance perspective. However, our operational contacts soon started feeding us observations they had made of themselves and of their colleagues that we could not have anticipated. This meant we had to be creative and innovative in our thinking and communication. It even led to the creation of new terms and associated analogies to help describe and articulate these new potential risks.

For example, the term 'underload drift' was coined when talking about low task demand over long periods of time. A boat in a river heading towards a waterfall was the imagery used to explain how we may feel like we are drifting along in these low workload settings, and can be caught by surprise by a waterfall, or in operational terms, by an increase or sudden demand to react to the traffic situation. The ability to resist the drift of performance, or cognitive inertia, is supported when the operational staff can prepare for their work session adequately, and a sufficient break schedule is implemented.

Low Workload Effects

Many of us are well versed in the potential risks associated with high workload and overload situations.

The cues are obvious as our sense of discomfort grows. Operational staff and watch management are trained to spot the signs in themselves or others, where action might be required to manage a high workload or overload scenario. These signs are unique to the individual and can be the misperception of elapsed time, getting frustrated at small mistakes, or missing calls – asking pilots to "say again" more frequently. For those supervising, they may notice controllers sitting more upright and closer to the radar screen, or a change in their conversational tone and volume.

But what about low workload or underload situations? There is no comparable feeling of discomfort and the cue is largely the absence of traffic or activity rather than the presence of it – silence rather than noise. And yet, internal trend analysis has shown that low workload or underload situations can result in impaired human performance in the same way that high workload or overload does. Underload can reduce alertness and impair how well our memory functions – we might be more likely to forget something we need to do or have just done. Visual scanning also tends to be less thorough or frequent – we are more likely to tunnel our attention in one place that attracts our attention, resulting in the neglect of other areas. We are more

susceptible to distraction from what is going on around us – especially conversations – and we are particularly vulnerable to the effects of fatigue and tiredness.

This phenomenon emerged in our operations room where controllers were socially distanced to reduce the risk of spreading COVID-19 and had to provide and receive remote telephone (sterile) handovers between watches at the beginning and end of duty. As a result of a joint activity with our operational safety colleagues, we discovered that controllers were using less effective strategies for the handover task. When considering this phenomenon, controllers are not purposely using these less effective strategies for the handover task because of laziness or lack of attention. In fact, that the state of being 'complacent' and 'disinterested' has been recognised as having a strong link to the neurophysiological aspects of adaption. Put simply, the brain is adapting to the task load it is faced with, and because of the lack of cognitive demand, it will slow down its activation.

A Problem Shared is a Problem Halved

In those first few months, we found risks we could anticipate (e.g., the effects of low workload or underload), and those we couldn't (e.g., handover quality), so that we had to adapt our normal methods of supporting the operation. During the early part of Summer 2020, it appeared that aviation was opening up a little more, so we sought to understand how we could help operational supervisors to identify and communicate potential threats in their new working environment. During those early summer months, we focused our activity on running team resource management (TRM) sessions with all group supervisors at our centre in Swanwick, England. As well as reflecting on how the working environment and the air traffic control job had changed for them, participants were reminded of the framework around threat and error management (TEM), and how that could be applied practically. Given that it's the most unpredictable time we've been in, the TEM technique was something we reminded supervisors to do, and to

share any hints, tips or watch-outs they had already noticed in the operation.

These workshops not only provided benefits to our operational supervisors, but also allowed us to gain further insight into the operation. Examples include the development of different ways of working due to watches not mixing, the effects of giving direct routings on planning and conflict detection (i.e., different 'hot spots') and a shift in individuals' different workload thresholds. This allowed us to provide relevant and tailored support, rather than making assumptions about the impact the traffic and the pandemic was having on human performance. Following on from this, the concern about so-called 'skill fade' was raised, and a communication piece was developed to advise supervisors to consider this for controllers returning from long periods of time off work, or as traffic levels start to pick up again.

In order to understand the operation's state, we carried out a 'human performance measurement' survey remotely for our centres and airports where controllers completed short surveys about their workload, situation awareness and workload drivers after each live controlling session. This data-driven approach to understanding the human response to the shift in traffic levels allowed supervisors – with immediate access to the results of the survey – to manage operational workload of their staff in real time. We analysed the data to determine at what

workload levels awareness of the traffic situation began to fall.

Today's Quicksilver World

Upon reflection, thinking of the work we've done concerning underload, threat and error management and measuring human performance, the context could not have been anticipated or predicted. We used our networks to share information, we discussed, we theorised, and we tested what we thought we knew. As always, collaboration (albeit now different) is key to understanding any potential risks and communicating our knowledge of the human response to help mitigate around this. Ultimately, we've learnt to work well under uncertainty and to be flexible when plans or the situation does change – a key skill for practitioners of all kinds, and for our personal lives. ⅃

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ONLINE TEACHING AND FACILITATION:

LESSONS FROM EXPERIENCE

Learning online has become the new reality for most of us. In this article, **Ceca Bunjevac** and **Steven Shorrock** share lessons from online teaching and facilitation, as well as their experiences in courses and conferences in the virtual world.

"Can you hear me?" "You're muted." "You've frozen." These are familiar phrases in the world of virtual learning. Most organisations have had to make a rapid transition to online learning, and EUROCONTROL is no exception. The familiar classroom environment zoomed into the online world at IANS – the Institute of Air Navigation Services in Luxembourg – where courses went online within less than a month from the start of the pandemic. Virtual went viral.

As trainers who use facilitation extensively in several courses and work together often on courses including systems thinking and communication skills, we thought it might be useful to reflect on some lessons learned over the past year or so about the unique online format.

Preparing for the Course

Work with a co-facilitator. This is an important lesson. A co-facilitator is your co-pilot or planner controller. They provide a back-up in case or problems, but also perform vital functions such as checking the chat, adding mentioned links to websites, making notes, spotting when someone wants to talk, noting the timing of breaks, and answering administrative and technical queries. Ideally, a co-facilitator will have complementary skills and traits. One of you might be the 'planner' type while the other is more 'tactical'. One might be a big picture thinker while the other is down in the details. But most important is to work with someone with whom you have a rapport and a good working dynamic. After a few sessions, the right dynamic means you'll be able to anticipate each other, quite like in the Ops room.

Train in facilitation skills. Instruction and facilitation require quite different skills. Much of the success of online facilitation will depend on facilitation skills learned and practised beforehand. We teach facilitation skills to controllers, engineers and safety specialists in an online format, and notice a common set of facilitation skills and practices, plus specific ones for in-person and online environments.

"A co-facilitator is your co-pilot or planner controller"

Manage your energy. One of the biggest predictors of how we feel about online teaching is our energy level. Without sufficient reserves, and strategies to manage energy, a three-hour session can feel like a full day at work…or more. Too much time in online learning can result in frustration, stress, and fatigue. Ensuring gaps between sessions is vital. For instance, two afternoons or an afternoon followed by a morning will usually be better than a full day. We have transformed three-day courses into three afternoons, plus some self-study elements (including online videos) for instance.

"One of the biggest predictors of how we feel about online teaching is our energy level"

Prepare interactive activities. This sounds obvious, but interactive aspects of virtual courses and events need even more preparation. Without the ability to explain in person, groups in breakout rooms need a very clear idea of what is intended.

Prepare for technical problems. Online platforms have a habit of updating or misbehaving at the wrong moment, for the organiser or participants. Logging in 15 minutes early to check that the platform is working, for you and other participants, will reduce stress. Having some self-study materials to hand, along with the email addresses of all participants, can also be a good idea in case of technical problems.

Be mindful of timing. With home working, we are having to mix responsibilities (such as home-schooling, different school trip arrangements, caring responsibilities). We have found it helpful to try to be mindful of this, and of whether people are joining from other time zones. While a European morning session may work well for those in Europe and those further east, a European afternoon session will obviously work better when there are participants in Europe and the Americas.

During the Session

Introduce yourselves…in the right way. Where participants don't know each other, short introductions are vital to have an idea of each other's work and context. Where there are more than 12 or so participants, video introductions can take up too much time and lose engagement. The chat function can be useful in this case so that people introduce themselves 10-15 minutes or so before the session starts during a short 'welcome period'.

Make careful use of the camera. Staring at many faces for long periods is fatiguing. This is unnatural in face-to-face environments where we look at one person at a time and also have more information about body language and context. It can be helpful to turn cameras off during some periods where engagement is not expected, then turn them back on for interactive parts of the session.

Make it interactive. We notice a difference in feedback for more interactive sessions. This can include whole group discussion, breakout rooms work on case studies, analysing video scenarios, questions to be answered in chat, and quizzes.

Manage fatigue. Most of us are used to so-called 'Zoom fatigue'. Several things contribute to this. In our experience, about 80 minutes is a maximum for a session before a break, and much of this time is interactive. Non-interactive presentations and instruction should not normally exceed 20-25 minutes. The total session should not usually exceed three hours (including breaks).

Lighten up. Paying some attention to lighting makes remote learning and teaching better for everyone. A lamp or natural light on the face makes it easier to see expressions. Try to avoid windows or harsh lights behind you.

Headsets. Operational staff are, of course, used to headsets. Similarly, in online learning environments, a headset makes a big difference to sound quality for everyone, in terms of clarity of transmission, ambient noises and echoes.

Beware the bullets. A common mistake in presentation slide design is too much text. This is even worse when people have to read one thing and listen to the presenter say something slightly different. Text can be used but often can be presented in more interesting ways, and in fewer words. Pictures, photos and diagrams will usually be better remembered (keep longer text for the notes section of the slides).

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Consider a real white board. A physical white board and second camera can be a useful (and inexpensive) addition to your work or home set up. Feedback suggests that this adds a sense of normality and also allows more movement.

Be accepting of human and non-human distractors. In a home-learning environment, we have to accept, and even embrace, small interruptions from humans and animals.

After the Session

Follow up. During courses and facilitation sessions, it is likely that several items of information have come up that participants would appreciate in an email. These could include specific links in chat (but not the chat history) or other links to further information, as well as any materials used during the session. Follow up with your co-facilitator as well; note what went well between you and try to do more of it.

Learn. Each session offers an opportunity to learn and improve. Get friendly feedback so that the next session is even better.

Enjoy. After all the effort invested, we owe it to ourselves.

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OPERATIONAL CHALLENGES AND OPPORTUNITIES FOR ANSPS

With air navigation service providers (ANSPs) and staff going through a period of many changes, challenges and opportunities have emerged in terms of human and organisational factors in operations. To get a flavour of some of these, various representatives of seven European ANSPs – from large to small – were asked to reflect on some of the challenges and opportunities on their minds.

Malta ATS

Francis Bezzina (Senior Head Safety, Quality, Security and Compliance)

"In my opinion, the biggest challenge is that we need to start thinking about areas which perhaps we have ignored in the past. These issues result not from serious safety occurrences, but from the effects of geopolitical tensions, pandemics, loss of income, furloughs, and natural disasters. We are living in a new world where a pandemic changed the entire fabric. Relatives were lost or affected by terrible sickness. There are fears that our families can be affected. The financial situation of ANSPs will probably never be the same. We must do more with less, with jobs in the firing line, and salaries that may go down, lowering standards of living. The entire landscape of our normality has changed, maybe forever. There are new dragons in the human factors areas and consequently our organisations, which may never be what we have been used to before the pandemic. The biggest opportunity is that we learn from this nightmare and do something before we are caught out again."

"The biggest challenge is that we need to start thinking about areas which perhaps we have ignored in the past"

HungaroControl (Hungary)

Ágnes Zörényi (Head of SQM System Development and Monitoring Unit)

Mihály Kurucz (Director of Safety, Quality and Internal Audit)

"At the present time, we have four key challenges. The first is maintaining competencies with such low traffic levels. ATCOs' and trainees' abilities to handle higher traffic load has to be tested in a simulator (in compliance with pandemic rules), and for trainees there is a lack of experience of handling situations in live traffic. Maintaining instructor competencies is a further challenge, although there are virtual instructor trainings. Flexible adaptation of hybrid training is important.

The second is that integration of students and new employees into the organisation has changed completely. Team building has taken place virtually, and the integration of new colleagues changes managers' tasks. It is also a challenge to bridge the gap between support staff and ATCOs without a degradation of the support service level.

The third challenge concerns stress management and mental fitness. What are the effects of cost-cutting and ANSP's economic difficulties on employees' stress levels and possibilities are there for stress management? Does ▶▶

"Building and sustaining mental resilience has become a key focus, including for TRM"

this tension affect everyday work, and if so, how? Similar questions arise for new aspects of fatigue management, focusing on emotional fatigue at an organisational level. There is a need to provide security in a time of uncertainty. Building and sustaining mental resilience has become a key focus, including for TRM.

Fourth, for management, online leadership, communication and information sharing pose a big challenge, along with change management. There is a constant need for re-planning and decision-making. In the near future, there is a need to reconsider staff management and resource management methodologies, as well as management of the effects of uneven workload.

There are some new possibilities. One of these is rethinking and retailoring the organisation to respond quickly to challenges. Communication will need to be adapted to gain up-to-date knowledge about employees, and for the employees to gain up-to-date knowledge about the organisation. More generally, there are possibilities to move from formal, fixed, slow processes towards less formal, flexible and quick processes. We can build on recent experience to facilitate of organisational learning."

Austro Control GmbH (Austria)

Lea Sophie Vink (Head of Human Performance)

"At Austro Control, one of the most pressing human and organisational factors issues has been the impact to confidence, resilience and other non-technical skills as a result of the pandemic. We have seen major shifts in the working cultures amongst teams as people have moved to home office and more isolation. For controllers, TRM and CISM have helped to shield and protect this, but for the wider company, more lessons need to be adopted from the ATM operation. In the future, Austro Control is focusing on human factors in change management as we look to implement strategies to not only recover from the pandemic, but also to modernise and optimise our network and facilities. We have found that communication is going to be vital, as fears and worries about the future of our industry are present and important to consider and address. We look now to the CANSO standards of excellence for human performance management to help guide us in all of these challenges."

"One of the most pressing human and organisational factors issues has been the impact to confidence, resilience and other non-technical skills"

Bosnia and Herzegovina Air Navigation Services Agency (BHANSA)

Vlado Jurić (Safety Manager)

Doroteja Lovrić (Safety Expert)

"With the emergence of the COVID-19 pandemic in Bosnia and Herzegovina, BHANSA has faced the challenges of organising work in the new working conditions. A significant fear was loss of competencies due to significantly reduced traffic. Official approval was obtained for a derogation from the application of by-laws enacted by the Bosnia and Herzegovina Directorate of Civil Aviation. BHANSA ensured that ATCOs can extend validation of licence endorsement for a period of four months in case it were not possible to fully meet the regulatory requirements. Another challenge was to organise work without disrupting business continuity. Despite the difficulties, we managed to organise this.

BHANSA introduced the Emergency Management Centre to prepare measures tackling coronavirus. We managed to keep continuity of work by moving all internal and external communication online, including official communication with our regulator. All theoretical training for operational staff was done online and with improvement of the pandemic situation, we managed to organise simulator training for ATCOs."

NAV Portugal

António Retorta (Safety and Security Directorate Safety Manager)

"In terms of human factors, one of the biggest challenges in the present and near future has to be the stress and fatigue involved in dealing with the crisis. This is not only with regard to the more obvious health component, but also with both the economic concerns and job stability concerns that have come in the aftermath of COVID-19. Adding anxiety to an already stressful profession is definitely not the best combination. In terms of organisational factors, the challenge will be to balance the need to cut costs, due to the lack of revenue, whilst not undermining the ability of the organisation to deal with the challenges and demands of recovery. This recovery will eventually occur, and the challenges will be even more significant if the recovery occurs quickly.

The biggest challenge in the near future and beyond is simultaneously the biggest opportunity. The question is how to combine growing digitalisation (AI, blockchain, etc) in the sector and its integration in the provision of our service, combined with the human aspect."

"The challenge will be to balance the need to cut costs, due to the lack of revenue, whilst not undermining the ability of the organisation to deal with the challenges and demands of recovery"

"The capacity to adapt to change will be essential "

DFS (Germany)

Jörg Leonhardt (Head of UX and System Design)

"One of the big challenges for the near future is how we can close the gap between existing and forced developments in automation and digitalisation, and the human operator. The gap is getting bigger as automation is increasing and already taking over some human tasks. So far, it is still balanced, though we can see a trend and some imbalances emerging. We need to establish a solid human-centred system engineering process to achieve an integrated human-machine system, or a joint cognitive system. This includes, beside the basic design process, the impact on selection criteria, training of operators and perhaps new roles in the ATM system. The corresponding opportunity is that we can achieve a human system integration and build a more efficient, flexible and safe overall ATM system."

Reference

https://www.eurocontrol.int/publication/human-factors-integration-atm-system-design

FerroNATS Air Traffic Services S.A. (Spain)

Pablo Caballero (Director General)

"The unprecedented situation that we are currently living in our industry due to the COVID-19 pandemic crisis gives us also unprecedented opportunities to continue adapting the role of the air traffic controller in our organisations to a highly demanding future.

Never have we had this level of overcapacity, with excellent available skills, and we have the obligation to keep our teams fully engaged. The capacity to adapt to change will be essential both in the short-term to face traffic levels variability or expand the responsibilities of ATCOs and in the midterm to adopt new technologies in the working environment." ⌇

HUMAN AND ORGANISATIONAL FACTORS
Q&A
REMOTE TOWERS

Osman Saafan is Director Corporate Safety and Security Management and Military Affairs at DFS.

With Cengiz Özdemir, Uwe Liebscher, Andreas Willmann, Tim Meinlschmidt (DFS)

1. What is a significant change planned within your organisation at the moment that has relevance to human and organisational performance?

Successful digitisation is an opportunity and a challenge at the same time. We are dealing with the question of a more flexible and efficient future service delivery model. We are virtualising our systems and striving for a significantly higher degree of automation. We are increasingly relying on cloud solutions. A concrete example is our remote tower control (RTC) project, which we have implemented. With its RTC project, DFS aims to cut costs in the long term by using new technologies and procedures and by optimising staff numbers. This will include making more efficient use of air traffic controllers and pooling operational, technical, and administrative support functions. Our Remote Tower Control Center (RTCC) in Leipzig is proving itself every day.

2. Why is this change necessary? What is the opportunity or need?

For DFS, RTC means the location-independent provision of aerodrome control services. A remote tower centre is not necessarily located at an airport or air traffic control centre, if the security requirements needed for the provision of such a service are met.

RTC increases efficiency and saves costs – with the focus on keeping safety at its highest possible level, a decisive factor in air traffic management.

At the RTCC in Leipzig, our remote tower controllers will be cross-trained and authorised for the three designated airports. Maintenance and repair costs are reduced immensely because the systems are bundled at one location. In this way, we can reduce the number of staff and plan schedules more flexibly and efficiently.

For the controllers, the job at an RTCC offers new opportunities and therefore will become more attractive, more digital and modern. It offers more variety than it is the case today at, for example, similar medium-sized single-runway locations.

3. What are the main obstacles facing this change?

From a technical point of view, the biggest challenge was to find a system for the out-of-the-window-view that met our requirements in terms of performance, flexibility, quality and safety.

The next challenge, however, was the introduction of a fundamentally new working environment. Even though the feasibility of the RTC project had already been demonstrated in 2012 by a human factors study together with the German Aerospace Center (DLR), we still had to deal with the change process.

Remote tower control is a paradigm shift in air traffic control. With it, we are taking the first step into a new world and a digital future.

4. What is the role of front-line practitioners? How is their expertise incorporated into change management?

We practised field expert involvement from the outset, an important and critical element of 'systems thinking'. The early involvement of ATCOs and ATSEPs (air traffic safety electronics personnel) was very important and contributed to the success of the first commissioning (Saarbrücken airport from RTCC Leipzig). For example, the ATCOs were actively involved at the very beginning of a tender and worked out their requirements themselves.

5. What do they think about the change?

Despite the commissioning of the first site, close monitoring by all involved employees is still required. The change process is not yet complete and will take some more time. Regular feedback meetings with those people involved are a means of achieving this. In this way, the ATCOs will continue to be actively involved in the further development and evolution of the system.

6. What has been learned so far, more generally?

The advanced functions are balancing the loss of the large tower windows, so they are appreciated and are now part of the daily work. The zoom cameras in use have different zoom settings, advancing the capabilities of binoculars. The infrared camera and infrared panorama are very helpful and give more details during darkness.

The safety concept developed together with ATCOs and ATSEPs works well and has proven its effectiveness. The RTC project has been accompanied by the safety assessment process from the beginning, all the way up to the implementation, always taking into consideration the human dimension. Thanks to that, an early implication of nearly all safety requirements in the development process was possible. In the end, three main safety cases have been established concerning transition phase including the implementation, ATCO training and target state. The project is constantly developing the system, always ensuring the necessary involvement of the operational colleagues. 🗲

FATIGUE AND CURRENCY:

HOW MORE DOWN TIME MAY INCREASE RISK THIS SUMMER

Fatigue has always been a familiar foe in aviation. With the return to flying, the challenges will increase as old coping strategies have lost currency. Pilot **Katy Lee** offers some reminders to controllers and pilots.

Around the world, many airline pilots have been furloughed for significant periods of the last year and, for the majority of those who have not, workloads have been much lower. The same can be said of air traffic controllers, cabin crew or any group of aviation professionals. For most of us, this down time has meant that we've managed to get into a regular sleep routine for the first time in many years: going to bed and waking up at more or less the same time every day, rather than being a slave to the rostering gods. From a health perspective, this is undoubtedly a positive thing. But it can't last, and aviation will return.

"Staff will be thrilled to be back working in the industry that they love, but we need to be mindful of the risks that this sudden ramp-up of flying may bring"

If booking predictions are to be believed, and assuming that governments let people travel, late summer 2021 will be a busy period for airlines, meaning that all services, from security to ground handling to air traffic control, will be equally in demand. Aviation professionals will find themselves working a much more 'normal' roster, with likely many back-to-back long shifts and ever-changing

working times. I have no doubt that staff will be thrilled to be back working in the industry that they love, but we need to be mindful of the risks that this sudden ramp-up of flying may bring.

Fatigue has long been a risk for airlines, especially amongst pilots, and with good reason. Roster patterns and demanding work can be challenging to juggle, and we will always have crew required to fly at times of circadian lows. Yet these statistics all come from when crew are in more recent flying practice and more accustomed to shift patterns.

When crew return to flying, the idea of getting up at 0300 for work on day one, flying until mid-afternoon and then returning on day two for a deep night flight, going to bed in the small hours of day three, will be a distant memory. The coping mechanisms that we all developed over years of trial and error will have faded somewhat. Combine this with the cognitive challenge of returning to line flying and all the pressures that brings, and we face a risky scenario.

Airlines are aware of this and most have adopted a pragmatic approach, eschewing the usual on-time performance and fuel efficiency in favour of pilot comfort, at least in the beginning. Rushing crews will lead to more errors being made and, when

everyone is rusty, this simply isn't worth it.

While crew who haven't been flying regularly will have been back in the simulator for currency purposes, nothing can really replicate a real-life line flight, and these will bring challenges. If, as air traffic controllers, you encounter pilots taking more time than usual, please do consider whether this may be the reason; our normal slick continuous descent approaches and single-engine taxiing are likely to have been put to one side while we familiarise ourselves again with our workplace. Our cognitive load will

"Mistakes are inevitable, even more so as everyone is less current than usual, and this requires all of us to ensure that these mistakes are picked up"

be higher, meaning it takes longer to switch between tasks, and things that used to be automatic now require more conscious effort.

Mistakes are inevitable, even more so as everyone is less current than usual, and this requires all of us to ensure that these mistakes are picked up. SOPs will be more important than ever. A few extra track miles on our

approach, and giving us time to set up in slow time, may make the difference between a successful approach and a go-around. Familiarity and more flying will, of course, herald the return of minimum track miles and high-speed approaches, alongside a return to crew's bodies coping with the irregular roster patterns.

There is no avoiding the risk of fatigue to all staff, no matter where they're working, but being aware of it and helping to mitigate this risk may well make a difference. Taking a little extra time to think over what you're doing, confirm your switch selection or your transmission, and regain that comfort and confidence in your work, will bring benefits. It's been a challenging year for everyone and the most important thing, as the world returns to normal, is to work together as aviation professionals and colleagues to ensure that we maintain the safety levels in our industry and in our skies. ⑤

Katy Lee is First Officer (B737-800), based in Birmingham, UK, with a keen interest in CRM and human factors in aviation, as well as mental health. She holds an MSc in Human Factors in Aviation and is a qualified flight instructor.

BACK IN THE SADDLE:

ADJUSTMENTS TO THE NEW REALITY OF WORK AT AMERICAN AIRLINES

Pilots at American Airlines (AA) are returning to flying after being out of the flight deck for extended periods. Crews now face additional COVID-19 protocols and policies that have changed the way they approach everyday work. **Bogomir Glavan** shares experience from recent interviews conducted with fellow AA pilots.

KEY POINTS

- Pilots coming off a lengthy leave of absence have personal techniques to regain their proficiency and knowledge base, as well as techniques to communicate a lack of recency to fellow crew members.

- Crews are spending more time engaging with flight attendants and other front-line workers to better understand how to support their work regarding the additional COVID-19 protocols in place.

- Mask compliance, enforcing that policy, and communicating while wearing masks are additional crew challenges.

AA's Learning and Improvement Team (LIT) resumed our 'Shop Talk' pilot discussions at the end of 2020. These are pilot-to-pilot conversations led by trained pilot facilitators. They last 30 minutes or more, reviewing recent experiences and everyday work on the line. Our focus areas for the start of 2021 concern recency with multiple pilots coming off leaves of absence and the operational impacts of COVID-19. This article will share some examples from these crew discussions and highlight how these front-line workers are adjusting and adapting to the new reality of work during the pandemic.

In total, 6,600 of our 14,000 AA pilots have taken some sort of multi-month leave during the pandemic. At the time of writing, flight hours flown are down roughly 50% from where they were before the pandemic. Pilots have taken advantage of multiple resources created by the pilot union and AA to prepare for returning to work. Most pilots have an established process to review mandatory callouts, procedures, and 'chair fly' more complex procedures like go-arounds or single-engine emergencies. In response to this concern, the LIT members asked the following questions to pilots:

- **How often do you fly?**

- **Were you on a leave of absence?**

- **How did you prepare for returning to work?**

- **Did your personal techniques make you feel ready?**

Here are three examples that pilot's shared of personal strategies for refreshing their knowledge base:

"When I do have a break of over a week, I review flows, single-engine profiles and other maneuvers. I created a sheet with limits, emergencies and profiles that I reference and review."

"I watch the flow guides in the online training section, then I review the flows with a cockpit mockup until they are natural again. I review systems and the maneuvers guide, with emphasis on emergency procedures."

"I look at big ticket items like engine failure procedures and call-outs, fight or flight responses a few days out. Now that I am going to some unfamiliar airports, I will sometimes look ahead to study the airport and company pages."

Pilots were then asked a follow-up question concerning whether they encountered anything unexpected on their first trip back. Pilots reported overall that nothing significant happened upon their return. Most seemed aware of their level of proficiency and made more deliberate efforts to communicate that to the other pilot.

One Captain (CA) remarked that with more task-saturation, he reverted to callouts from an aircraft he was qualified on previously.

"I actually had a goof up and found myself making some callouts from the 777 (previous aircraft). My First Officer (FO) asked 'what was that?' and I realized I had defaulted to primacy. I said 'max power', and not TOGA. My brain just went back to what it is most comfortable with."

The LIT group realized this return-to-work issue was a significant concern within the safety department and wanted to explore how pilots approached work differently when they had been away from the flight deck for an extended period of time. So, we asked pilots the following question:

- **How do you discuss your recency of experience with other crew members before departure?**

Most pilots agreed this was an area of concern but they also stated that it is openly discussed within the first few minutes of crew introductions at the gate or on the flight deck. Their answers showed a surprisingly candid tone:

"We all know that is an area of concern and not being around aviation for a while makes us rusty. We then become more alert."

"Yes, especially with the captains I see who come back from their time away – it comes up naturally during the crew intro

in preflight within the first 5 minutes. They state how long they have been out and we discuss what they prefer to do, I like to recommend I take the first leg as pilot flying and let them get the big picture back."

"I tell my FOs about my recency and concerns for proficiency. I tell them outright to speak up, it won't hurt my feelings. I find if I compliment them and keep things open it helps them feel more empowered to speak up later in the flight."

AA recently retired four aircraft types, leading many pilots to change equipment qualifications and operating aircraft with minimal experience. Two pilots below shared their mitigation strategies for addressing this with their crews.

"I brought up that I was new with the entire crew. There is always a lot of discussion as there are many of us that are low time and not flying regularly."

"I have spent the last few years flying international widebody, so the pace of domestic narrow body is challenging. I tell them if I forget something call me out on it."

As with all aspects of our world today, pilots explained it is hard to find any part of everyday work not impacted by the pandemic. The LIT group explored this theme by inquiring:

- **How have you changed your approach to your work during the COVID pandemic?**

Pilots described adapting, namely dealing with mask protocols and restricted communication, as well as needing more time for additional procedures and announcements. Their responses ranged from addressing mask usage to cleaning and physiological needs:

"I use cues from our introduction as to how the FO feels about the protocols and adjust my communication method based on that. For example, with mask usage in the flight deck, I see what the FO wants to do."

"I try and create a little extra space between others because I know some   ▶▶

are concerned and I want to set a good example, because I know a lot of people are watching us. I also have to adjust how I project my voice with the mask on to ensure I am heard. On that note, I also have to read people with more focus on eye movements and facial expressions since the mask covers up quite a bit to infer from."

"I spend more time with the briefings and getting to understand what the concerns are of the crew. I get there extra early now, at least an hour, so I can get set up. I need extra time now for the PAs and various items we need to cover for COVID protocols."

Dealing with stress is a core part of the pilot's skill set and thus they are well equipped to defuse many of these newer complex interactions. The last question explored their response to added complexity and interruptions.

- **How have the various restrictions and quarantine protocols affected your habit patterns at work?**

"I make the PA to the passengers personal so they know their compliance is of utmost importance and I need them to be safe for the Flight Attendants and crew to be able to operate best. I also add into the PA a quick summary of the technical info of the air recirculation and the filtering so they have some peace of mind. 'Breathe easy because we are going to have a great flight today!'"
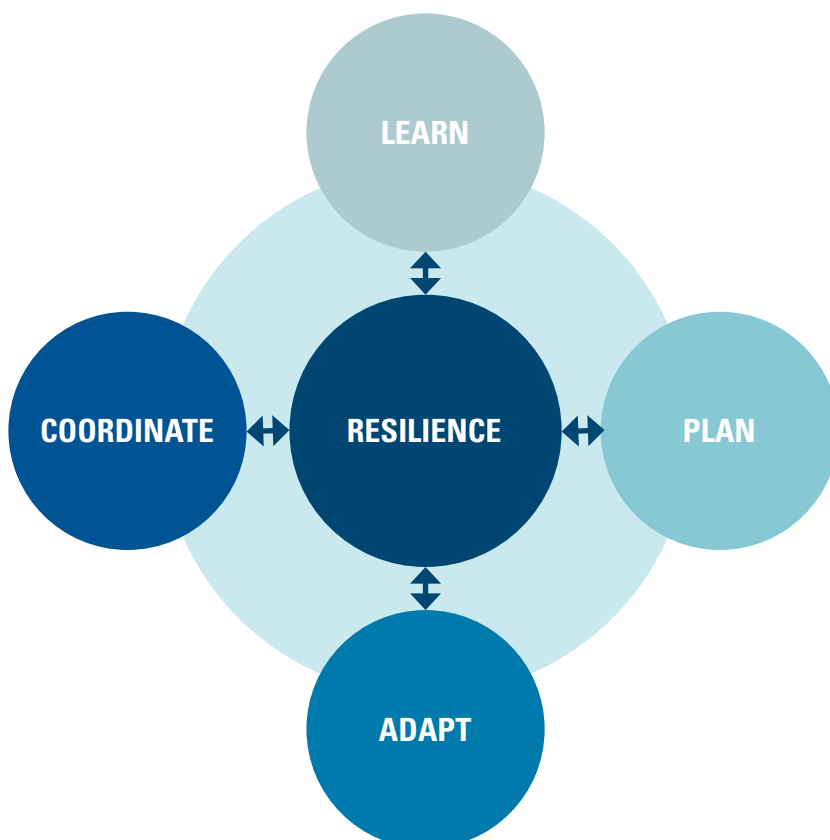
"I just take my time and create an environment where my crew feels like they are not pushed."

As you can see, these are topics many of us have had on our minds lately and we are trying as a safety department to get a sense of their impacts. With thousands of pilots returning after an extended absence, our interviews have revealed that crews successfully mitigate the risk from a lack of recent flying experience by taking extra time to study and prepare before their first trip back. They also are forthcoming with other pilots about their time away to increase their peers' awareness and ability to be more effective monitors. The information and personal examples we gather from these Shop Talk sessions provide a unique and critical insight into the working conditions and challenges our pilots face. These qualitative data have been an invaluable complement to our flight deck observations in understanding the complexity of this COVID-19 operating environment. ⦚
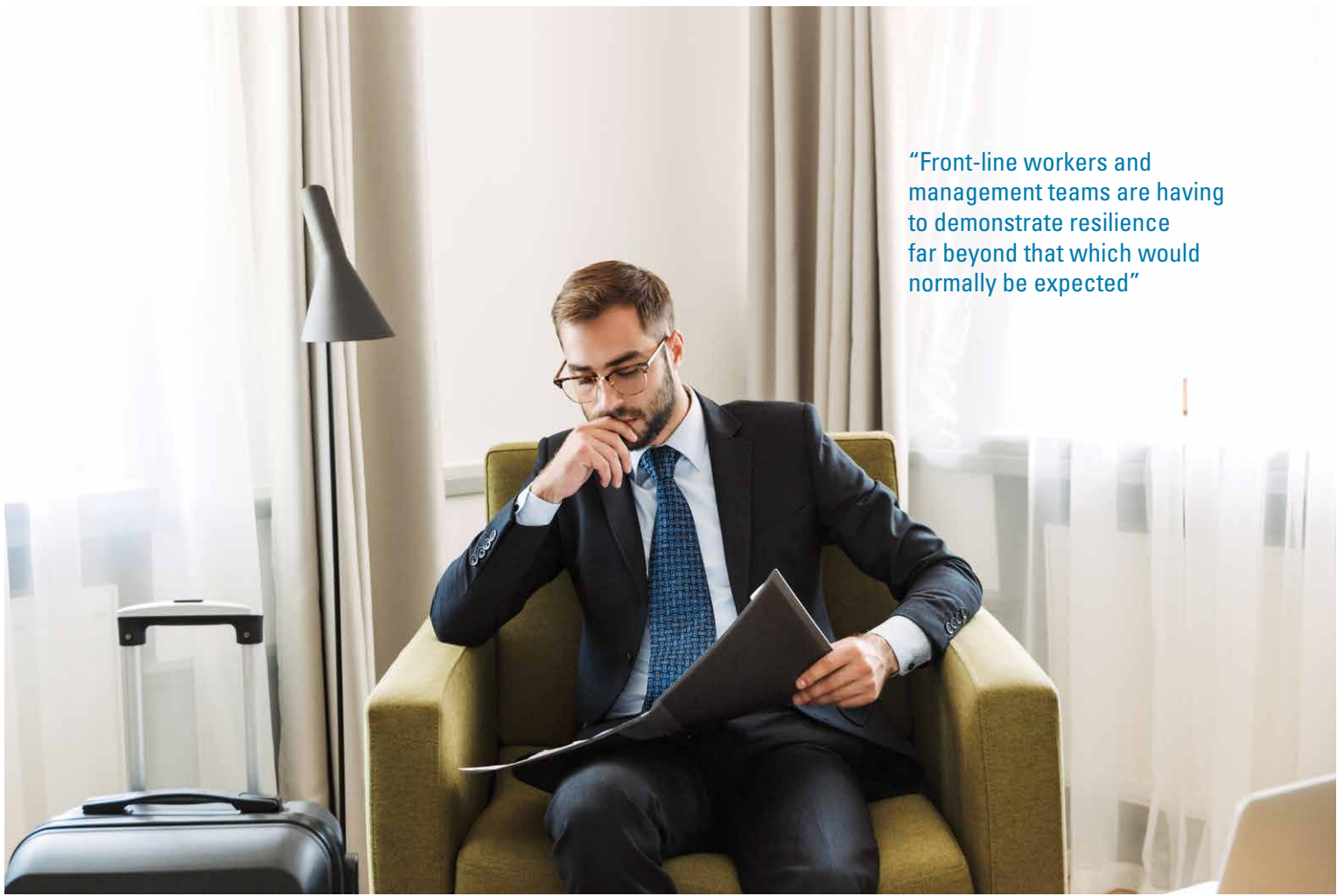
First Officer Bogomir Glavan is a founding member of AA's Learning and Improvement Team. He transitioned to commercial aviation following 20 years in the United States Navy serving as a Commanding Officer and Chief Staff Officer. Bogomir has been involved at AA as a safety observer, new pilot recruiter and training facilitator. Bogomir has a degree in Biology from the University of North Carolina and a Masters in Global Leadership from the University of San Diego.

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"Our interviews have revealed that crews successfully mitigate the risk from a lack of recent flying experience by taking extra time to study and prepare before their first trip back"

MARGINAL GAINS IN SAFETY, WELLBEING AND PERFORMANCE AT CATHAY

Radical changes to flight operations have prompted changes to crew rostering. **Pete McCarthy** explains how Cathay adapted communication with the crews in isolation around the world, with a focus on wellbeing and safety.

The theory of 'aggregated marginal gains' can be traced back to 2003, and the beginning of the British dominance of the sport of cycling, under the guidance of their Performance Director, Sir Dave Brailsford. The theory suggests that small consistent changes ('the 1% principle') will be compounded to produce much better performance over time. Radical or transformational changes can have the opposite effect and can throw your performance into disarray.

COVID-19 has certainly brought about radical and transformational change in the aviation industry. All of our safety-critical workers have seen their routines and normal operations disrupted. Operators and organisations need to create new processes, and communicate new directives on an almost daily basis just to keep up with the changes in regulation, law, public health advice and disruption to planning. In order to maintain the highest levels of performance and safety, front-line workers and management teams are having to demonstrate resilience far beyond that which would normally be expected.

One example of this is 'closed-loop operations'. In order to operate in a region with some of the strictest

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quarantine restrictions for flight crew and cabin crew, we have had to make radical changes to the way crews are rostered. Crews in the closed loop will be rostered for 21–28 days of operating (remaining in isolation in hotels between sectors), then spend 14 days in quarantine at the end of that pattern. For some crewmembers this means up to six weeks of separation from family and friends, isolation and loneliness. For some it is an opportunity to fly, get things back to normal, and have some 'me time'. But wellbeing and safety performance are a key concern for all crewmembers. All crew are volunteers for this pattern, and a careful risk assessment is conducted ahead of the operation.

"We introduced the operational learning review (OLR), in order to gain real insight into 'normal work' at our airline"

From a safety management perspective, this radical change is a risk that needs to be managed carefully. We have taken an active approach to managing this risk by utilising the marginal gains approach, improving the operating environment for the crews one small bit at a time. How have we done this?

About 12 months ago, we introduced the operational learning review (OLR), in order to gain real insight into 'normal work' at our airline. The OLR is a method we use to engage with our front-line experts. It:

- is non-judgemental and curious
- has no jeopardy for the crewmember, and
- is designed to facilitate the sharing of the context around crewmember's decision and actions.

Due to closed-loop operations, we decided to use the OLR process to communicate with the crews in isolation around the world, with a focus on wellbeing and safety – we called this 'learning from the loop'. A call was put out to the crews, asking for volunteers to help us learn anything which could make the experience easier and safer for all of our crew. The engagement and feedback continue to be exceptional. Accountability and responsibility for managing and understanding the situation has become shared.

We combine the OLR data (de-identified and anonymous), with pulse survey data, and twice weekly video-meetings with all of the crew around the network. We are then able to make incremental changes on a weekly basis to make the situation better for all. Learning and subsequent action has included making dynamic changes to rostering and planning in a much shorter planning window than would normally be possible. This has ensured that minimum time is spent in hotel isolation around the network when the crews could and should be flying. The learning has also enabled us to liaise directly with the quarantine hotels, with up-to-date information from a well-informed viewpoint, in order for them to make positive changes based upon valid and reliable feedback from the crews.

Most importantly, through the data gathered, we have gained an understanding of how individuals are coping in real time, and how our marginal gains approach is helping

with their resilience. We are gaining an accurate picture as to how wellbeing and wellness may be affecting safety performance. We have built a bridge and created a trusted link between our front-line operators and our safety management system (SMS). Combined with all of our other sources of data, we now have a much more accurate feel for the overall wellbeing in the system. This may at this early stage only be a 'wet finger in the air'. As with the weather, an anemometer may be required to get a true wind speed reading, but a wet finger in the air can indicate which way the wind is blowing and how strong it is!

Looking ahead and looking to the wider restart, we are now also able to share proven strategies with those outside of the loop – those looking to return to flying who may be anxious or uncertain due to their prolonged absence. We can use all of the knowledge we have gained to ensure we can get everyone back safely into the aviation mindset.

All areas have been involved in making these incremental changes: planning, rostering, flight operations and general administration (even the staff at the quarantine hotels). It has been a team effort and the result has been a measurable increase in perceived wellbeing and satisfaction in the loop. I am convinced that our focus on wellbeing, and better understanding of the importance of it, has made us safer and more operationally effective. S

"We have gained an understanding of how individuals are coping in real time, and how our marginal gains approach is helping with their resilience"

Pete McCarthy is Head of Group Human Factors at Cathay Pacific Airways. He is also Visiting Fellow (Human Factors and Accident Investigation) at Cranfield University, and has acted as aircraft accident investigator in the British Army, Military Air Accident Investigation Branch, Farnborough, UK. He is undertaking a PhD in aviation safety and human factors at Cranfield University.

FRENCH SAFETY STUDY ON THE LOW ACTIVITY PERIOD

The pandemic has not only affected health and traffic levels, but also the risk landscape. In this article, the **DSAC Safety Management Coordination Team** outlines the findings of a study on new threats in France, with some example reports from pilots.

Background

Non-stabilised approach

Scenario: Morning return flight, pilot flying on the way back. During the briefing, I mention the threat of under-training (one return trip every 15 days since June, 700 flight hours on [aircraft type]) and therefore the fact that I no longer dare to disengage the automatic systems. CAVOK, the captain offered to help me by increasing his monitoring in order to put me at ease and allow me to train. I hesitate, but with my Control 1 Training 1 deadline approaching, I want to train. AP FD ATHR disconnected at 6000 ft before the LOC interception, runway in sight. The approach goes well, then after full flaps I go high, I correct, speed a little high, I reduce (too much) then go under the slope, under VLS. I readjust the thrust and correct the slope just before the flare. We should have gone around.

Since March 2020, we have observed that some risks in aviation are linked to the COVID-19 low activity period. From the very first weeks of the traffic collapse, many actions have been taken by national and international authorities and by the operators themselves, and concerns have been expressed about new threats. Our French Civil Aviation Authority (DSAC) safety coordination team decided to study these new threats, on a short- and long-term basis, along with old threats whose effects might have escalated. This article aims to provide an outline of this study, and includes a small number of illustrative scenarios.

This analysis aimed to:

- assess the safety risks generated directly or indirectly by the safety issues arising from the current health crisis;
- ensure that operators have taken into account all the safety issues that relate to them within the framework of their safety management system (SMS), or in their safety policies for operators who do not implement a SMS; and

make recommendations as a means of reducing risks.

Approach

This study is part of a coordinated approach to continuous risk management, which is at the heart of the State Safety Programme (SSP) in France. It is based on:

- our team's analysis of 8,000 event reports in France (around 40% of all reports between May and October 2020, and 7% of these reports were examined and classified in the light of the DSAC COVID portfolio – the taxonomy of safety issues specific to the health crisis);
- analysis of SSP indicators (safety topics in the reports, based on textual fields of the ADREP accident/incident data reporting taxonomy); and
- feedback from French oversight activities.

Key Results

State Safety Programme indicators

Although the low number of reports does not allow for a statistical analysis of the results, the variation of some indicators is helpful and relevant to determine priorities and actions. From the existing data in the DSAC database, some initial trends are as follows:

- The wildlife hazard indicator rose the most. This increase was particularly noticeable between the months of May and July 2020 after the initial lockdown. After a peak during the return to operations, the rate of reports on wildlife hazard remained above normal until October (the end of the study period).
- An increase in non-stabilised approach/non-compliant approach (NSA/NCA), also noted by IATA and some airlines. The possibility of shortening the approach path or making visual approaches to save time, as well as the temptation to disconnect automation to maintain manual handling skills, have been cited as potential factors in these events, like the report above.
- The absolute number of unruly passenger reports did not increase significantly, but events related to non-compliance with health instructions did occur. This resulted in an increase of around 30% in the rate of unruly passenger reports per million passengers for the French airlines.

Management system

Many operators (e.g., airlines, aerodrome operators, ANSPs) have seen the operation of their management systems affected to varying degrees. For some operators, this has resulted in:

- a risk to the ability to maintain internal oversight programmes;
- a delay in the analysis of safety events, with often poor diagnosis; and
- more rarely, a delay of up to several weeks in reporting their events.

Threats also arose in connection with the management of change in operations (new operations or changes in the network due to the crisis), where procedures are not always detailed in the organisation's reference frameworks

(such as cargo flights or flights with derogations).

Unavailability of aircraft rescue and firefighting service (ARFFS) and wildlife control personnel have also been detected.

Take-off with unfinished weight and balance process

Scenario: After receiving the validation on ground, I do not tell the co-pilot that we have to wait [for the update before departure] … We are then overwhelmed by the difficulty in getting a push and leave without [update before departure]. After the take-off, we receive a correction loadsheet modifying ZFW [zero fuel weight] and ZFWCG [zero fuel weight centre of gravity].

Elements of analysis: The mass and balance procedure is completed by the captain's signature and reception of the message [update before departure] (MANEX A). 'Hurry-up syndrome' is a threat during turnaround. It is all the more topical with low loads implying faster boarding and the means on the ground not being systematically available when the crew is ready. Good analysis of the crew. FSO return to flight crew for recall.

"Many events reveal errors, omissions, and loss of routines that could be a sign that practice is lacking"

Training, checking and recency

Reports often contain little or no information on the training of professionals and their recent practice. However, many events reveal errors, omissions, and loss of routines that

could be a sign that practice is lacking. These errors can sometimes seem insignificant and are classified with low levels of risk by the operator's analyses. They nevertheless show a lack of practice which can, depending on the context, prove more critical. There are also possible signs of pilots' lack of self-confidence, for example in reports reporting long (or supposedly long) landings, where the demands for parameter analysis are greater than usual, but also with short or hard landings. Lack of practice also results in lack of skill and confusion between controllers, or a lack of responsiveness to particular situations.

Take-off despite alarm

Scenario: Special cockpit because it is my flight [...] to take over after 5 months without flying. Instructor in the right seat and two co-pilots in seats three and four. Rolling [...] for runway 02R. Rolling with a heavy workload because we had initially planned for runway 01L. Aircraft parameters reset, briefing updated and procedure [...] carried out. 3 contradictory ATC instructions also add load: "Hold short 02R" then "Line up 02R and wait" then again "hold short 02R". We arrive at the stopping point ready, C/L performed. And we are cleared for alignment [line-up] and take-off 02R. During the thrust setting, the alarm sounds furtively, "Config Gear Steering". I announce Stop, but the instructor announces, "No, it's ok". At that moment, I approve and we continue the take-off. On second thought, we should have stopped the take-off, especially as we were at low speed and that's what had been evoked at the briefing for any alarm before 80kts. The particular cockpit of the flight, the fact of being PM and therefore not having my hands on the controls at that moment, and maybe also the fact of still being "young" on this plane, made me take a bad decision.

Human performance

Non-compliance with procedures and working methods is present in the reports and feedback from oversight activities in almost all areas. This can have different reasons, e.g.:

- a drop in traffic leading to a drop in attention and reduced vigilance (ATCO);
- lack of recent practice;
- new procedures created by operators to adapt to the crisis less well assimilated; and
- pressure induced by the reduction of staff (ground handling).

However, the decrease in adherence to procedures may be more indicative of lack of practice and loss of routine and habitual reference points than of intentional non-compliance.

NSA: "Exit flaps instead of speed brakes"

Scenario: During the approach, FL 090, 250kt, shortening of the trajectory by control and speed reduction. Mistake on my part and release of the flaps for a few seconds instead of the speed brakes. High speed alarm. Incident reported on the TLB [tablet for logging incidents], after technical inspection, aircraft ok.

Elements of analysis by the operator: "Little traffic on the frequency, ATC requests a reduction of trajectory with a short remaining distance announcement, the captain is surprised, this possibility had not been evoked during the briefing. His first reflex is to extend the SPOILERS but he makes a mistake, he sets the flap control to extended by mistake, and it is reset to 0 as soon as the error is detected. In order to delay, he asks ATC to extend the downwind to redo his action project. No aircraft damage found after technical inspection. A lack of feeling at ease is undoubtedly a contributor to the event."

"Non-compliance with procedures and working methods is present in the reports and feedback from oversight activities"

Implications

Different recommendations were addressed to the operators: airlines, airports, ATC, airworthiness, ground handling and general aviation. For instance, they are all invited to share their experiences to avoid programming pilots close to their recent experience limits and to maintain ATCOs' ability to cope with the traffic peaks' workload.
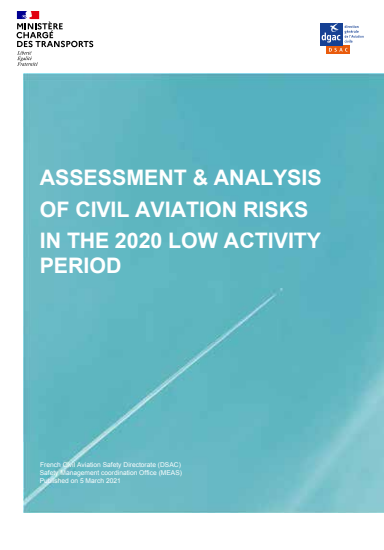
Recommendations were not addressed directly to front-line workers, but to organisations, for instance, to make workers aware of specific risks. These include late changes in approach path, NSA/NCA, wildlife hazards, similar call signs, runway incursions and special operations like cargo flights without cabin crew.

Next Steps

At the time of writing, the health crisis is taking on new forms, and it is far from over. There seems to be a resurgence of a form of uncertainty comparable to the one that prevailed at the beginning of the health crisis. It is difficult to anticipate the duration and scale of this new phase, which – at the time of writing – is already producing further marked drops in activity. It is therefore to be expected that the risks identified in this study may well be prolonged, or even that new threats to civil aviation will emerge. Our team of safety analysts is therefore currently working on an update to this study. As the period of low activity is set to last, vigilance is still required.

The original study can be found here:

www.ecologie.gouv.fr/en/measures-taken-france-concerns-aviation-safety-deal-consequences-covid-19-epidemic or bit.ly/3fVFqOn ⤴

MINISTÈRE
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ASSESSMENT & ANALYSIS OF CIVIL AVIATION RISKS IN THE 2020 LOW ACTIVITY PERIOD

French Civil Aviation Safety Directorate (DSAC)
Safety Management coordination Office (MEAS)
Published on 5 March 2021

HUMAN PERFORMANCE IN THE SPOTLIGHT: UNDERLOAD

In this series, human performance issues are addressed by leading researchers and practitioners in the field. **Mark Young** gives some insights into mental workload and the problem of 'underload'.

What is mental workload?

This is one of those human factors concepts that is very difficult to pin down and, consequently, there are numerous definitions of mental workload. But the common theme among most definitions centres around a balance between objective task demands on the one hand (that might be something measurable like the number of aircraft in a sector) and, on the other, the individual's resources to deal with those demands. 'Resources' could be attention, skill, experience, or technological support. Some researchers say mental workload is very much a subjective thing, so it's about the experienced demand as much as anything.

"Mental workload is very much a subjective thing, so it's about the experienced demand as much as anything"

What is 'underload' and how is it different to boredom?

To me, *underload* is about having to be engaged in a task where the demands are exceptionally low, but they are not non-existent – for instance, supervisory control of an automated system. *Boredom* is more about having nothing interesting or meaningful to do, or a lack of engagement. The other close relative is *vigilance* – having to monitor for a low-frequency event, such as an automation failure. Research consistently shows that performance on this kind of task starts to fade within 20-30 minutes, but some argue that maintaining this kind of vigil is actually a high demand task, which would make it quite the opposite of underload.

What are the human performance problems that tend to be associated with underload?
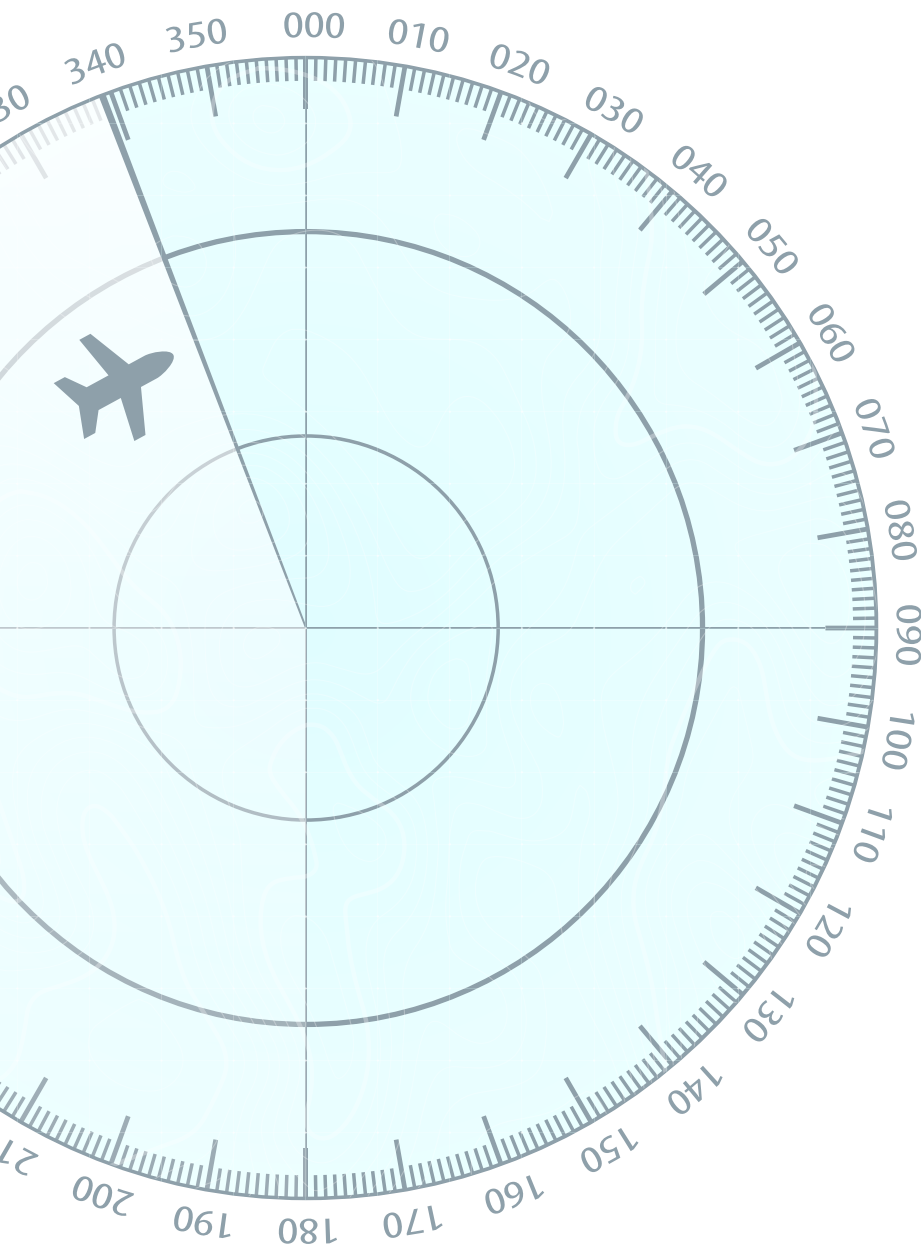
When underload is associated with routine, repetitive tasks, it can lead to a cognitively automatic mode of responding – habitually doing the same thing over and over, without much conscious thought. On the face of it, this might sound like it has some benefits, but the lack of attention can result in errors. A clear example of this was highlighted in a UK Rail Accident Investigation Branch (RAIB) investigation of an accident on the London Underground, in which a passenger became trapped in the doors of a departing train and dragged into the tunnel, suffering serious injuries. The train was highly automated, leaving the driver with very little to do other than attend to station duties – a task which had become very routinised, as just described. Consequently, the driver did not notice the passenger trapped in the doors before starting the train.

But typically, problems occur when workload suddenly increases. Imagine this scenario from the not-too-distant future: you've been behind the wheel of a self-driving car on the motorway for a while and then, suddenly, something happens that the automation can't cope with and you have to take control. Under normal circumstances, manual control might be well within your capabilities. But after a period of underload, it takes a while for our attention to 'spin up' and get back to a state of being able to deal with that. We're only talking maybe tens of seconds or even a minute or so, but that can be a long time in a critical situation.

There are various theories about why this happens. Some say it's about effort regulation, because at extremes of workload people find it difficult to match their effort appropriately to the task. It could also be about low physiological arousal associated with the lack of stimulation – there is a classic 'inverted-U' curve relating arousal with performance, where anything too low or too high causes problems, but somewhere in the middle is just right. My own research suggested that our attentional capacity actually shrinks when we are faced with underload (which could also be related to arousal), so that when workload suddenly increases again (like in the automation failure scenario), we don't have the resources to cope with it. This can cause problems in how people respond to the critical situation – slower reaction

Mark Young is an Inspector with the Rail Accident Investigation Branch (RAIB) and leads the Branch's work on human factors. Before joining RAIB in 2012, he worked in academia, researching and teaching in human factors, with a focus on transport safety and vehicle automation. Mark has around 25 years' experience working in human factors, holds a degree in Psychology and a PhD in Human Factors, and is a Visiting Professor at Loughborough University's Design School.

times, less effective reactions, and even whether they react at all.

What can individuals, teams and organisations do to reduce the risks associated with underload?

I'm very much an advocate of designing out these problems in the first place, so I would not want to suggest much that puts the onus on front-line personnel to deal with it. It shouldn't be their problem. I guess at the most, an awareness that underload can be a problem is helpful, so if they feel their performance might be at risk as a result, they can feed that back up through the appropriate channels.

Personally, I don't think training is the answer. There are some strategies that have been advocated to try to keep your attention up. Probably the most useful of these is to try some kind of running commentary on the task, but this is often not realistic in tasks that involve a lot of verbal communication or where it could be distracting to others.

Really, this is one of those human issues to which we're all susceptible, so the solution should be about the task. A lot of underload research has been driven by automation – the technology-centred push to automate as much as we can without thinking about the impact on the person. I'm not technophobic, but I would just say let's look at ways to support the person in doing the task that they are already good at without taking too much of it away.

Frequent short breaks could help to restore attention, and they are particularly useful to counter the vigilance decrement I mentioned earlier. Even a few minutes off-task can help. ↰

"Let's look at ways to support the person in doing the task that they are already good at without taking too much of it away"

EUROCONTROL SAFETY AND HUMAN PERFORMANCE
KEY PUBLICATIONS

Global Action Plan for the Prevention of Runway Excursions Published

Runway excursions – when aircraft unintentionally veer off or overrun the runway on arrival or departure – are one of the most serious risks in aviation. They comprised 23% of accidents between 2005 and the first half of 2019 according to IATA (International Air Transport Association) data.

The *Global Action Plan for the Prevention of Runway Excursions (GAPPRE) Part 1* was published in January 2021 after being signed by the European Union Aviation Safety Agency (EASA), the Civil Air Navigation Services Organisation (CANSO), Airport Council International (ACI), the International Air Transport Association (IATA), the Flight Safety Foundation (FSF) and EUROCONTROL. GAPPRE contains 101 consensus-based recommendations that define actions beyond regulatory compliance for regulators, ICAO, aircraft manufacturers, airports, ANSPs, aircraft operators and research organisations.

The plan is a product of almost two years of effort by the global aviation industry, coordinated by EUROCONTROL Network Management Directorate (NMD) through the Safety Team and the Flight Safety Foundation. GAPPRE was developed by a global team of more than 100 professionals from over 40 organisations in six working groups led by the industry (IATA, CANSO, UK Civil Aviation Authority, Gulfstream, Aeroport Charles de Gaulle and NLR Netherlands Aerospace Centre).

GAPPRE Part 2 was published in May 2021 and contains explanatory and guidance material and best practices. A combined document now contains Part 1 and Part 2 (see below).
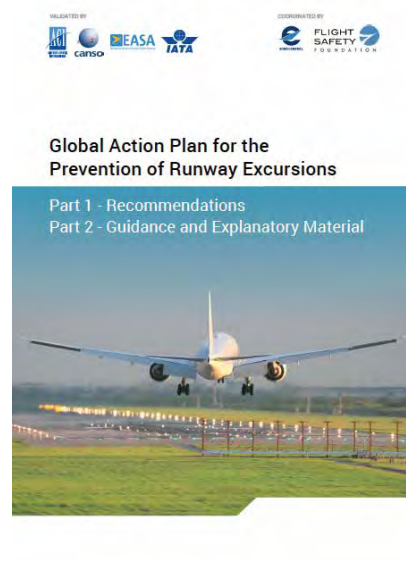
Iacopo Prissinotti, Director Network Management EUROCONTROL, said that *"GAPPRE's guidance material and best practices helps aviation organisations put in place recommendations from the GAPPRE report. As aviation prepares for the recovery of air traffic, I encourage all operational stakeholders to use these recommendations, of course taking into account local conditions and specific contexts, to reduce operational safety risks to truly 'build back better' European aviation."*

The risk of runway excursion depends on a number of factors such as runway condition maintenance and reporting, aircraft performance and operations, and collaborative approach path management, and can be mitigated by adhering to robust policies for safe descent and approach planning, stabilised approach, safe landing and go-around.

The aviation experts who identified the most important actions to reduce the risk of runway excursions were led by representatives from IATA, CANSO, UK Civil Aviation Authority, Gulfstream, Aeroport Charles de Gaulle and NLR Netherlands Aerospace Centre with overall coordination by the Flight Safety Foundation and EUROCONTROL. The experts reviewed accident and incident data, single runway excursion event scenarios and best practices, and suggestions on risk and resilience management.

Further reading

- SKYbrary (2021). *Global action plan for the prevention of runway excursions (GAPPRE)*. https://skybrary.aero/index.php/Global_Action_Plan_for_the_Prevention_of_Runway_Excursions_(GAPPRE)

"GAPPRE was developed by a global team of more than 100 professionals from over 40 organisations"

Safe Start-Up: Key Analysis Released by EUROCONTROL Safety Team

The EUROCONTROL Safety Team (comprising ANSP Safety Directors and Managers, as well as EUROCONTROL specialists) and its SAFOPS group developed a safety argument and a list of potential hazards associated with the recovery of normal operations following COVID-19 aviation lockdown. These documents are intended to help ANSPs plan and execute a safe and resilient return to normal operations. The activity was part of the collaborative effort to ensure a safe, smooth and coordinated recovery of European ATM network operations from the lockdown caused by the COVID-19 pandemic.

The material was also jointly coordinated with CANSO CESAF and with EASA ATM CAG (Collaborative Analysis Group) and has been integrated and updated weekly in the Network Operations Plan (NOP). The purpose of the safety argument is to support ANSPs by providing a comprehensive reference to elements of ANSPs' functional systems that may have been affected during the COVID-19 lockdown period and need to be properly accounted for and managed when planning and executing the transition to normal operations.

Further reading

- SKYbrary (2021). Safety argument: Transition to normal ATS operations. https://www.skybrary.aero/ bookshelf/books/5741.pdf
- SKYbrary (2021). SAFOPS – List of potential hazards associated to the recovery of normal operations following COVID-19 aviation lockdown. https://www.skybrary. aero/bookshelf/books/5742.pdf

Top 5: 2020 OPS Safety Priorities – European Coverage

Network-wide Top 5 Safety Priorities Identified

The Safety Team conducted a new exercise to identify the Top 5 safety priorities that have network-wide commonality for 2020 using a safety functions map (SAFMAP) analysis. The SAFMAP review uses 2019 incident data from 17 ANSPs (see figure below with the coverage of the exercise). This analysis looks not only into how and when things failed (how barriers failed to stop an event propagating further), but also at resilience, including when and how things worked (the barrier that stopped an incident from propagating further on the accident trajectory).

Further reading

- SKYbrary (2021). EUROCONTROL top 5 operational safety priorities. https://www.skybrary.aero/index. php/EUROCONTROL_TOP_5_ Operational_Safety_Priorities

"The Safety Team conducted a new exercise to identify the Top 5 safety priorities that have network-wide commonality for 2020"
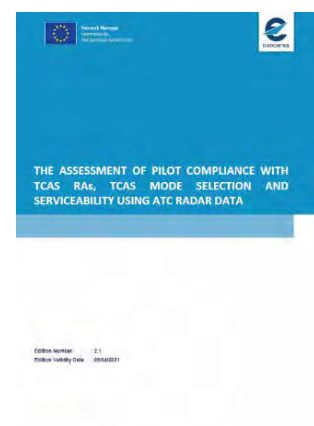
TCAS Resolution Advisory Compliance Study Updated

The Safety Team carried out a study of pilot compliance with TCAS resolution advisories (RA) (see *HindSight* 31). *The assessment of pilot compliance with TCAS RAs, TCAS mode selection and serviceability using ATC radar data* was published initially in October 2020 and updated in February 2021 to address comments. In total, 1184 RAs were examined.

In the updated analysis, an alternative and less rigid assessment method was used that gives credit to a pilot having to change vertical rate significantly (e.g., from climb to descent) even if the final required vertical rate has not yet been achieved. According to the updated method, just over half of the RAs were responded to correctly 8-12 seconds after the RAs. Compliance varied depending on RA type and duration and in the worst case the correct compliance was as low as 38%. The results are in line with the previously conducted research. However, the new method indicates significantly fewer cases where the pilots were assessed to be not responding to the RA at all, or to be responding in the opposite sense. Additionally, the compliance assessment has been conducted based on the aircraft type and operation type (no significant differences were found).

Further reading

- EUROCONTROL (2021). The assessment of pilot compliance with TCAS RAs, TCAS mode selection and serviceability using ATC radar data. Brussels. https://www.skybrary.aero/ bookshelf/books/5842.pdf

TCAS Statistical Data Released

Have you ever wondered how many TCAS RAs happen each day? Or at what altitude there is the most climb RAs? Finally, we have answers to these questions and many more in the recently published report on TCAS statistical and performance data. The data has been mainly obtained from radar recordings collected in core European airspace and supplemented by snapshot of airborne statistics.

Further reading

- EUROCONTROL (2021). Traffic alert and collision avoidance system (TCAS): Selected statistical and performance data in core European airspace. Brussels. https://www.skybrary.aero/bookshelf/books/5986.pdf

The EUROCONTROL Safety Culture Programme Explained

EUROCONTROL has released a white paper on the past, present, and future of its pioneering safety culture programme. 'The past' considers the history of the programme and why it came about. 'The present' considers what ANSPs have learned through the programme, how their organisations have been changed by it, and also the EUROCONTROL perspective on how it has shaped the industry. 'The future' considers where the programme should go next, and what will be required to achieve this. Although the principal focus is on ATM, since that represents the evidence base for this White Paper, there is growing interest and application of safety culture approaches in other aviation sectors including airlines, airports and airframe manufacturers.

Further reading

- EUROCONTROL (2021). The future of safety culture in European air traffic management [White paper]. Brussels. https://www.skybrary.aero/bookshelf/books/5993.pdf

"There is growing interest and application of safety culture approaches in other aviation sectors including airlines, airports and airframe manufacturers"

Patterns in How People Think and Work

Patterns can be found everywhere throughout aviation, including information about traffic, load, approaches, and operations. In January 2021, the EUROCONTROL SAF Unit published a white paper in the context of the 'weak signals' project in partnership with DFS and academia. This white paper provides the basis for an inventory of patterns and lay the foundation for pattern identification in ATM.

First, the paper illustrates:

- what a pattern is
- how people think in patterns, especially about disruptions and recovery
- how visual patterns aid thinking, and
- how engineering has used visual patterns to bridge the gap between general principles and highly variable specific situations.

Second, the paper explains the pattern approach and its role in connecting research and practice in human-computer interfaces, and in the design of human-machine and human-automation joint cognitive systems. It explains how pattern finding is important in proactive human and organisational aspects of operations.

Third, the paper illustrates three use case topics where pattern finding provides information about emerging risks and vulnerabilities that go beyond specific incidents in specific contexts.

Further reading

- EUROCONTROL (2021). Patterns in how people think and work [White paper]. Brussels. https://www.skybrary.aero/bookshelf/books/5987.pdf

HindSight32

Human Factors in operations

OUT NOW
https://www.skybrary.aero/index.php/Hindsight_30

EUROCONTROL

THE NEW REALITY

NAVIGATING THE NEW REALITY
By Steven Shorrock

MAKING IT EASY FOR PEOPLE TO DO THE RIGHT THING
By Immanuel Barshi

A GLOBAL AEROMEDICAL PERSPECTIVE ON THE NEW REALITY
AN INTERVIEW WITH ICAO'S **ANSA JORDAAN**

FATIGUE AND CURRENCY
By Katy Lee

A SURGEON'S TAKE ON HUMAN AND ORGANISATIONAL FACTORS
A CONVERSATION WITH **MANOJ KUMAR**

Plus much more on human and organisational factors in aviation, shipping, healthcare, rail, and beyond.

Summer 2021

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EUROCONTROL SAFETY UPDATE
EUROCONTROL SAFETY TEAM AND SUBGROUPS

The EUROCONTROL Safety Team (comprised of ANSP safety directors and managers, as well as EUROCONTROL safety specialists) and associated subgroups meet regularly each year. This update gives a flavour of the activities, including supplementary webinars.

Just Culture Task Force (JC TF) Update

The Just Culture Task Force (JC TF) promotes debate and discussion on issues related to safety and justice, with a wide membership from aviation, rail, maritime, and healthcare. It supports dialogue between safety and judicial experts and develops guidance in support of the implementation and dissemination of just culture.

Just culture task force webinars
The JC TF hosted four webinars, attracting around 1,500 participants, in cooperation with ICAO, European Union Agency for Railway (ERA) and University of Messina. These are available to view as follows.

- Webinar 1: Just Culture in Practice (27 October 2020). See https://youtu.be/ruZ-668f8QU
- Webinar 2: Just Culture: Front-Line Operators Perspective (28 October 2020). See https://youtu.be/XrrKm-6Fu_I
- Webinar 3: The Organisation's Point of View (29 October 2020). See https://youtu.be/4fzG4BywU70
- Webinar 4: Just Culture in Healthcare (17 November 2020). See https://youtu.be/LiGy8VydMbc

JC TF meetings in 2021 will be held in June and November. There is also an on-line version of the Just Culture prosecutor expert course.

Just culture manifesto now online
The EUROCONTROL Just Culture Manifesto was published in November 2020 to articulate a vision of just culture that connects with people from all industrial sectors, around the world. The manifesto speaks to people in all roles – front line, support, specialists, management, both in private industry, government organisations and departments, and the justice system. See this issue of *HindSight*.

First list of ops experts (pilots and controllers) for the judiciary
For a number of years, the EUROCONTROL Network Management Directorate, through its SAF Unit, has been running the Prosecutor Expert Course (PEC) together with IFATCA (International Federation of Air Traffic Controllers' Associations) and the ECA (European Cockpit Association). Active pilots and ATCOs from the EUROCONTROL Member States participate in a 2½ days course with criminal prosecutors to prepare as safety experts that would be available to assist any national prosecutor in cases of aviation incidents and accidents. We have been assisted in this endeavour by a group of senior judiciary members (judges and prosecutors) from various Member States.

The objective of the course is to prepare such experts with the appropriate knowledge and attitudes to be able to help prosecutors in deciding whether an incident that has come to their attention is a potential criminal offence or not and therefore whether to start criminal proceedings against the relevant aviation professionals.

This course has been created at the initiative of the JC TF. The JC TF has successfully promoted the concepts of just culture for many years and has several deliverables, one of the most successful being the above-mentioned Prosecutor Expert Course.

The course and its proceedings are also in accordance with the EUROCONTROL Model for a Policy regarding criminal investigation and prosecution of aviation and railway incidents and accidents, as unanimously endorsed by the Provisional Council in 2018.

The final objective is to have a list of such experts endorsed by EUROCONTROL and made available to the judicial authorities from the Member States. It is the decision and choice of any prosecutor to avail of an expert from the list, thus leaving them the freedom of action, in the full respect of the independence of the justice system.

The first list has now been confirmed and validated, based on criteria that were agreed within the JC TF and accepted by IFATCA and ECA. The list comprises 20 ATCOs and 13 pilots, who have undertaken an initial and an advanced course, and participated in annual just culture events.

Safety Human Performance Sub-Group (SHP-SG) Update

The SHP-SG is a forum to support safety and human performance improvement in the provision of air navigation services. The SHP-SG meets twice a year. SHP-SG also organised a series of five webinars on safety and HF master classes to promote systems thinking in addressing occurrence investigation. The five events, led by Nippin Anand (former master mariner), were attended by over 1,000 participants.

- Webinar 1: The three aspects of a learning organisation (14 September 2020) (dedicated session to C-suite level leadership). It highlighted three key aspects of the Costa Concordia accident that ran through the entire series of webinars: (1) Alternative perspectives (2) Situated expertise and (3) Meaningful compliance.
- Webinar 2: Introduction to the Costa Concordia maritime accident (24 September 2020).
- Webinar 3: Human and organisational factors in safety-critical operations (13 November 2020). This session provided a deeper understanding of teamwork, leadership, and team dynamics in safety-critical operations.
- Webinar 4: Managing the unexpected (18 Jan 2021). This session examined the events during and post-accident to understand the role of plans and procedures. The participants appreciated the role of procedures and plans in the face of uncertainty and discussed issues that were becoming increasingly relevant to businesses and society at large in a post-COVID world.
- Webinar 5: Discussions and debriefs (1 Feb 2021). The purpose of this last webinar was to bring together the key learning outcomes and create space for discussions and debriefing for the entire series.

New Critical Stress Incidents Management (CISM) deliverables

The following Critical Stress Incidents Management (CISM) deliverables have been released:

- Critical Incident Stress Management - Implementation Quick Guide, August 2020.
- Critical Incident Stress Management: Implementation Guidelines, February 2021.
- Implementation of a CISM Programme Video Clip, November 2020.
- CISM Intervention Video Clip, November 2020.

Further reading

SKYbrary (2021). *Critical incident stress management in ATM* (including video animations for Implementation of a CISM Programme and CISM intervention). https://www.skybrary.aero/index.php/Critical_Incident_Stress_Management_in_ATM

EUROCONTROL (2020). *EUROCONTROL critical incident stress management: Implementation quick guide*: https://www.skybrary.aero/bookshelf/books/5882.pdf

EUROCONTROL (2021). *Critical incident stress management: CISM implementation guidelines.* https://www.skybrary.aero/bookshelf/books/951.pdf

EUROCONTROL (2021). *Team resource management: Guidelines for the implementation and enhancement of TRM.* https://www.skybrary.aero/bookshelf/books/6049.pdf

Webinar on patterns in how people think and work

A EUROCONTROL white paper on *Patterns in how people think and work* was supported by a webinar on the importance of the discovery of patterns for understanding complex adaptive systems. The webinar, on 25 March 2021, was provided by David D. Woods (Professor in Integrated Systems Engineering at the Ohio State University). David has developed and advanced the foundations and practice of cognitive systems engineering since its origins in the aftermath of the Three Mile Island accident in nuclear power. This field combines concepts and techniques from cognitive psychology, computer science, and social sciences to study how people cope with complexity. His studies have focused on human systems in time-pressured situations such as critical care medicine, aviation, space missions, intelligence analysis, and crisis management. He designs new systems to help people find meaning in large data fields when they are under pressure to diagnose anomalies and re-plan activities. His latest work is to model and measure the adaptive capacities of organisations and distributed systems to determine how they are resilient and if they are becoming too brittle in the face of change. The webinar is available at https://youtu.be/t81eUI3vtWI

Webinar on mental flexibility for ATCOs

A webinar was held on 29 April 2021 on mental flexibility for ATCOs, particularly on the balance between phases where the demands are high and where demands are low. Markus Flemming, a former professional Ice-Hockey Goalie and Psychologist, has coached the Eisbären Berlin (Ice hockey Club Berlin) since 2007 and is supporting numerous German National Teams, including the basketball team, the field hockey team, the handball team and the ice-hockey team, which won the silver medal in the 2018 Olympic Games in Pyeongchang, South-Korea. Markus has been with the DFS since almost 10 years and developed a program with Jörg Leonhardt called: mental flexibility for ATCO's. Markus spoke in this webinar about the balance between phases where the demands are high and where demands are low. He gave insights in how professional sport teams cope with the Covid constraints and prepare under difficult circumstances. The webinar is available at https://youtu.be/eo8e17-phxw

Safety Management Tools User Group (SMTUG) Update

This subgroup (and its Change Control Board – CCB) manages the development and use of safety tools such as eTOKAI (Tool Kit for ATM Occurrence Investigation), RAT (Risk Analysis Tool), APF (Aerospace Performance Factor) and ASMT (Automatic Safety Monitoring Tool). SMTUG/CCB has released eTOKAI 3.0 (December 2020) and 3.1 (March 2021).

Operational Safety Group (SAFOPS) Update

The Operational Safety Group (SAFOPS) is a group within the framework of the EUROCONTROL Network Manager (NM) cooperative decision-making processes. SAFOPS provides support in driving operational safety improvements and in fulfilling the NM task specified in EU 2019/123 from 24 January 2019 to *"identify operational safety hazards at network level in cooperation with operational stakeholders and assess the associated network safety risk and report them to the Agency"*.

Key risk areas deliverables:

- Supported NM collaborative process for identification of COVID-19-related hazards/safety issues. The resulting collaborative example list aggregated the collective knowledge on the subject and was widely used by many organisations in Europe and globally.
- An annual Top 5 review process was performed based on data gathering and analysis workshops with 17 ANSPs. The identified top 5 priorities are: 1) controller blind spot; 2) flight without transponder or with a dysfunctional one; (3) ACAS RA not followed; 4) controller detection of potential RWY conflict; 5) airspace infringement.
- The safety functions map barrier model (tool to process the Top 5 data and support the prioritisation process) was reviewed, updated and the report 'SAFMAP Models' was published.
- Five dedicated safety surveys were performed on issues raised by the

NM operational safety stakeholders and 5 briefings were issued on: (1) Four-digit ATC callsigns; (2) one runway, one frequency, one language implementation; (3) return to service after COVID; (4) tactile button use; (5) runway incursion classification.
- The SKYbrary project management included facilitation, maintenance, content management and launching the modernisation project for the SKYbrary platform. SKYbrary kept its position as the most popular aviation safety knowledge base in the world and reached more than 6 million users for the year.
- Five SKYclips promoting specific safety aspects were developed and published: (1) En-route wake encounter; (2) Emergency frequency (121.5, GUARD); (3) Airspace infringement and aeronautical information; (4) Airspace infringement; (5) Shortcuts and unstable approaches.

Further reading

SKYbrary (2021). *SKYclips*. https://www.skybrary.aero/index.php/Solutions:SKYclips

SKYbrary (2021). *EUROCONTROL top 5 operational safety priorities.* https://www.skybrary.aero/index.php/EUROCONTROL_TOP_5_Operational_Safety_Priorities

CANSO and EUROCONTROL Partner on Safety

An agreement with CANSO European Safety Directors Group (CESAF) was signed in February 2021 on the scope and forms of cooperation. The cooperation between CESAF and the EUROCONTROL Safety Team may comprise various types of activities, including but not limited to:

- exchanging safety information
- sharing expertise and best practices
- cross-participation in working groups, where appropriate and in accordance with the respective rules of procedure of each other's organisation
- increasing efficiency by ensuring that the EUROCONTROL Safety Team and CESAF aim at a coordinated work plan to reduce duplication of effort
- developing joint positions and/or recommendations, and
- coordinated messaging to third parties, including (but not limited to) regulatory and legislative authorities, vendors and the media.

Read more at https://canso.org/canso-and-eurocontrol-partner-on-safety/

CARMA (Civil Aviation Resource Management Application) User Group (CARMA UG) Update

Civil Aviation Resource Management Application (CARMA) (and its Change Control Board) is a network of users. It aims to ensure that the application is continuously reviewed and improved and fosters the harmonised use of the resource management applications. So far in 2021, CARMA UG/CCB has released CARMA Release 2.0.

A SURGEON'S TAKE ON HUMAN AND ORGANISATIONAL FACTORS:
A CONVERSATION WITH MANOJ KUMAR

Healthcare is perhaps the most complex safety-critical sector, and the challenges have only increased throughout the COVID-19 pandemic. Increasingly, human and organisational factors have come under the spotlight. **Manoj Kumar** is a consultant general surgeon with a background also in safety, human factors, and training. In this conversation with **Steven Shorrock,** Manoj provides insights and perspectives on the realities of work in healthcare, and the team's role in improvement.

KEY POINTS

- The 'new reality' in healthcare has most elements of the 'old reality', in terms of leadership thinking and organisational culture.

- Those in positions of senior leadership need to be as adaptable and agile in decision making and learning as other professionals.

- Teams can resolve most problems and realise most opportunities, given the time, freedom and resources.

- Team-based quality reviews link reporting directly to regular team discussions, and feed the team's learning back into training and the governance process.

- Focusing only on learning from adverse outcomes or snapshots of work can result in a lot of lost learning.

- Reducing unnecessary bureaucracy can enable horizontal communication and adaptability in an organisation, making it more effective.

- Issues of wellbeing and diversity are now issues of active reflection and discussion.

Steven: *Thanks for making the time to talk, Manoj. I'm wondering how you got into the profession of surgery.*

Manoj: I'm a general surgeon with an interest in benign upper gastrointestinal surgery and abdominal wall hernia. I perhaps came to this profession through a different path to most of my colleagues. I come from a far less privileged background and certainly there were no doctors in my family.

Steven: *How did that influence your work?*

Manoj: Well, when I got my medical degree and started my first job as a of

junior doctor, the first thing I noticed was that I was in a smaller minority in terms of background, but also in terms of my insight and my perception of this whole career. Then when I joined surgery, you can imagine it became even more evident. Very early in my career, I was also a patient in the NHS [National Health Service], so that also gave me that opportunity to see things differently from some of my colleagues, which I certainly found to be an advantage. I suppose I knew what it was like to be in a vulnerable position and to have anxieties that go beyond passing or failing an exam.

Steven: *And you are also involved in human factors. How did that come about?*

Manoj: I did my masters in the subject in 2009 at Aberdeen University. That again set me off in a slightly different path than most of my colleagues, which was great because this was definitely much needed in healthcare. I eventually got onto this role as the National Clinical Lead for the Scottish Mortality and Morbidity Programme which has since evolved to 'team-based quality reviews'. So my current role is really split between being a consultant surgeon, focussing on elective and emergency work and that of my national role based primarily with NHS Education for Scotland.

Steven: *What are the main challenges and trade-offs that come up for you in working with patients?*

Manoj: I always wish I had more time to spend with the people I meet or see. I think most of us come into this profession knowing that delivering good care and building trust, especially with those who are at their most vulnerable when they meet you, requires spending a reasonable amount of time listening to their concerns, anxieties and hopes. What little time that we have, either on a ward round or in clinics, involves a constant battle between receiving vital information and providing the necessary information. And whether we like to admit it or not, something has to give if more or less time is spent with a patient. More time with a patient will impact on available time for something or someone else, often resulting in less time for ourselves, rest, families, home, etc. Less time spent

with a patient can, and unfortunately does from time to time, result in near misses, 'incidents', or indeed harm. It can be difficult to get the balance right.

"Most folks don't realise that 'good' and 'bad' often have the same origin story"

Steven: *I was about to ask what a typical day looks like, but I'm aware that there probably isn't one and I know you're in surgery today, unexpectedly.*

Manoj: This is where it gets interesting. I was not meant to be in theatre today. It has been a busy morning, having had to take a patient to theatre as my colleague got caught up with another clinical commitment. There's an element of unpredictability in this work. And it happens fairly regularly, especially in the current climate. Most healthcare systems have been designed to run to get the most out of them, with finite resources. So everything has to fall into place on a daily basis. When something doesn't fall in its place, then you see workarounds or trade-offs, which fortunately often result in a good outcome. But if someone forgets something or something unexpected happens and the right filter is not there to capture this, you can get a poor outcome. Then, it is not uncommon that this can evolve into blame of the person at the sharp end, or worse. Most folks don't realise that 'good' and 'bad' often have the same origin story.

Steven: *So it's kind of running with very little spare capacity and few degrees of freedom. How does the pandemic change things? Is there a new reality for you?*

Manoj: There is certainly a new 'awareness', though in a sense there isn't a new reality as such. You have the same people running the same organisation and perhaps sometimes applying the same thinking to try and resolve a new challenge. Perhaps you will tell me it's the same in other industries. The National Health Service is the best thing we have in Scotland and the UK, and it's an amazing resource that we should all be so proud of and it can and will continue to improve. We do have to be aware that Sometimes the the culture

can be ingrained with the same thinking or traditions that can hamper progress.

Steven*: Are you talking about leadership?*

Manoj: Yes, in part. There is always that risk of being trapped in an echo chamber where individuals may inadvertently surround themselves with like-minded folks who are likely to resist challenging the status quo. And sometimes, it is easier to get onto that ladder to these leadership posts if you fit that description. It can result in a rather exclusive club that naturally becomes detached from the 'messy reality' that you have written about previously. Those outside that exclusive circle may struggle to get a seat at that table – never mind get their voices heard – and those who do challenge may be viewed as a troublemaker or be 'spoken to'.

Most in leadership roles are well-intentioned individuals trying to do the right thing. But it's that issue of applying 20th century thinking that "this is what worked or did not work for us before" to resolve current complex challenges. We should reflect on past experiences but that should not paralyse our ability to take on new challenges.

I think 'leadership' is sometimes overhyped to the point where we see significant resources being spent on leadership programmes, etc. This, once again, is focussed on the few. And we are sometimes still left with command-and-control thinking.

Steven: *Can you give us an example?*

Manoj: Early in the pandemic, I noticed one hospital that came up with this concept of 'gold', 'silver' and 'bronze' leadership levels. And there would be emails noting that silver leadership has asked bonze leadership to do something. In a way, it made some of the staff ask where their position was – seat 38A at the back of economy class?

You can see the thinking: good individuals trying to do good things but with perhaps a misguided sense of what leadership is about. It perhaps can be described as this heavy-loaded goods train going on this one track, and

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you can get on it and get to where they think you should go, or you get off. But the reality is, things still function on the ground level.

Steven: *So on the ground level, where do staff come into this in healthcare?*

Manoj: You have this brilliant group of people who regularly go beyond reasonable expectations to make a significant positive contribution to their workplace and care that is offered. We have to be conscious that some of these brilliant people do get left behind, sometimes because they are not given the opportunities to progress for unfortunate reasons and biases. Or they are viewed as 'difficult' because they have challenged the status quo. They naturally become withdrawn and disengage. And so you do lose that diversity in thought amongst other things.

I have always believed that the focus of any organisation should be on teams – that collective will or sense of shared purpose. This is what we should be investing in. Give people the opportunity to get together and figure things out themselves and support them with the required resources and time to resolve these challenges.

"You have this brilliant group of people who regularly go beyond reasonable expectations to make a significant positive contribution "

And that's what we've seen in the pandemic. It was those teams working day in, day out – cleaners, nurses, porters, doctors, and so on, working collaboratively under intense pressures – actually making a real difference, and they could do that because they were able to support each other, adapt and overcome problems. We have seen some countries that continue to be amazing because of the people, and not because of the leaders, at times. It can be similar in organisations.

Steven: *You mentioned earlier about the heavy goods train metaphor for leadership and culture. How do you personally respond to that? Do you choose to get on the train and try to switch it to another direction, or do you stay on the sidelines?*

Manoj: That's interesting. The reality is it's so complex that it's a bit of both. Soon enough, you realise the wins that you can make. The key things that helped us are clearly articulating the 'why', showing there is a problem, and trying to demonstrate the pathway to how we can actually get there. This is why I'm so focused on these team-based quality reviews.

Steven: *Can you tell me a bit more about the team-based quality reviews? What's the thinking behind them?*
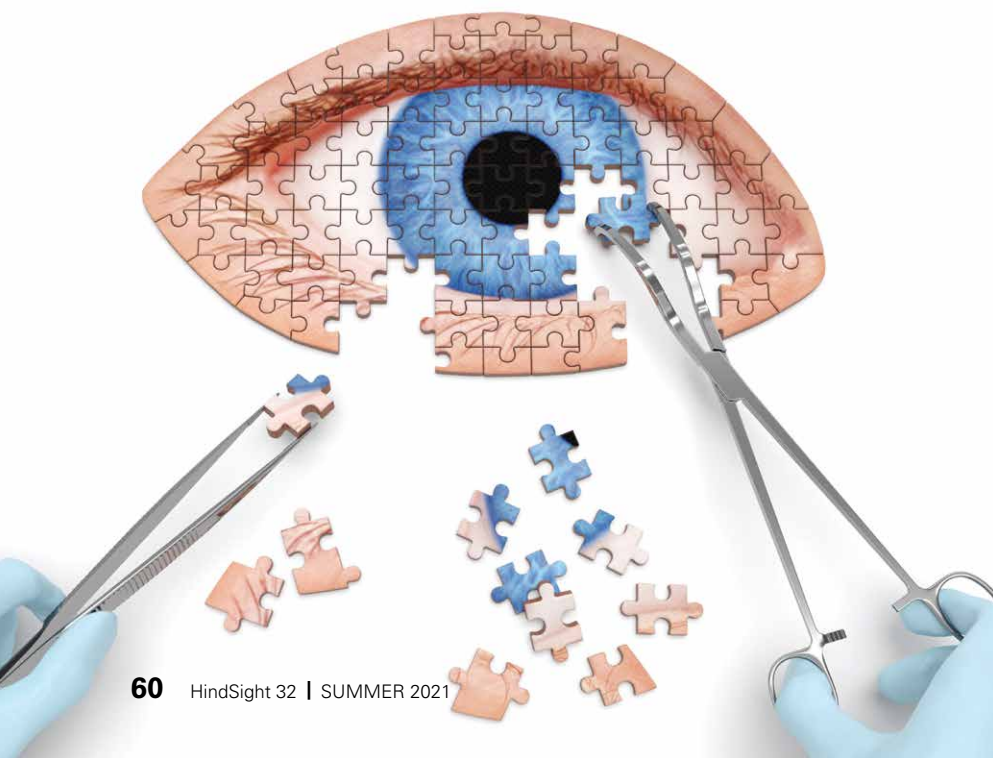
Manoj: In the health service, there is a reactive approach to 'harm', which is to wait for a tragic event and then spend a huge amount of time and money on reviews trying to understand what went wrong. And these reviews may be led by individuals in senior positions who may not necessarily have had the support or training in concepts of human factors. There is also the added challenge of what 'safety' actually means to different people in different roles. And these reviews are often conducted with little input from those who were involved in the event, such as next of kin or the team delivering care. So there is that significant risk that the output of these reviews may be incomplete delayed, or, worse still, flawed. And their recommendations can have little impact in preventing another 'event'.

If we can support people to get together to sit regularly and participate in a somewhat structured social process of inquiry to ask those questions, then we are on a start towards improvement. This means listening to patients' and carers' perspectives in these discussions.

One of the other things that is evident in review processes in healthcare services, perhaps more so in the NHS, is that they can be outcome-driven. We often look at a single snapshot in what is essentially a complex journey for the patient. The reality is that not all people who die in hospitals have had poor care, while there is a significant number of people who don't die, but did have poor care. So, if we just focus on deaths, we're missing a huge amount of learning and areas that require improvement, which if addressed in a timely manner could potentially prevent such terminal events. We need to expand the review processes.

Steven: *What you do in the team-based quality review? What is the process?*

Manoj: Essentially, a team-based quality review is about having an informed workforce that have the time, tools and training to come together regularly and look at what has gone well and not so well in the care they provide. A significant element is bringing in the

"Traditionally in healthcare, whether we acknowledge this or not, reporting has been used to blame people. We are seeking to change that"

patients, families and staff perspectives into these reviews. The process starts with having the right systems in place to capture relevant information. Specifically, this is a reporting or learning system that can be accessed and used easily, but also one that can function as a learning resource. This information is then shared with the team who can use appropriate tools or frameworks that are grounded in HF principles to carry out the required analysis of why things worked well or why they did not. Traditionally in healthcare, whether we acknowledge this or not, reporting has been used to blame people. We are seeking to change that.

We saw an improvement in engagement and more openness in reporting when people understand the purpose of reporting, the benefits of a 'systems' approach to analysis, and work collectively as a team to find solutions to complex challenges. And this feeds back to the organisation's governance process, to those who are ultimately accountable to ensure relevant changes are made or teams supported.

Steven: *So, instead of the data going into a black hole where you don't see it again, it comes back to you in a sense.*

Manoj: Exactly. There are, of course, challenges, including how do we change the perception that reporting systems are synonymous with punitive repercussions. We need to change this thinking of reporting of adverse events as negative and reporting of 'excellence' as positive. The reality is that both are positive measures to help us improve the care we can offer. If we create a safe space and have right tools, right structure, right systems and processes, people actually speak up. And in complex systems, you need

this to happen regularly in a manner that results in timely positive change. Otherwise, we will continue on this never-ending journey of waiting for something catastrophic to happen before we initiate expensive reviews and decide on change.

Steven: *You've heard, of course, about all of the ways in which aviation could benefit healthcare. I'm keen to hear about the reverse – what front line operational staff in aviation and elsewhere can learn from healthcare. So that's one example. Do you have any other examples of practices individually, as a team or as an organisation?*

Manoj: One thing is that in NHS Scotland, we can call anyone from any speciality, in any hospital, and get their help without any significant barriers. Yes, there may be disagreements on the specifics of management plans, but this is good because it allows everyone to give our patients the best management plan possible. Whether it's specific patient care or helping with training or reviewing organisations systems or processes, there's a great spirit of cooperation.

Steven: *On the pandemic, have any key lessons emerged, in terms of how it was before and how it is now…perhaps any changes you'd like to keep?*

Manoj: There was, and perhaps still is, this situation that, if a wrong decision was made, it was on one healthcare professional alone. There was little understanding of the complexities behind decision-making, especially in healthcare. I think there is a greater recognition of the complexities that we all work in, why decisions make sense at a particular time and more and more you see an interest in understanding of human factors science and its significant relevance.

One other thing that the pandemic has forced us to look at closer is on wellbeing, especially stress, burnout, and dissatisfaction. People sometimes forget that those working in the health service also have lives outside of work and they have challenges like everyone else.

In the last year or so, we have also seen an increased awareness of issues around diversity. It may not be obvious to some, but this is also a significant safety issue.

These problems and challenges were always in existence and will perhaps continue to be there. But, interestingly enough, the pandemic has forced most of us to pause and reflect, and because now there's more conversation on wellbeing, people are at least talking and continuing to raise awareness about it. And we are seeing changes, thanks to the masses who are pushing for change. I think people are looking within their teams and at themselves, asking, "how can we be better?"

Steven: *You mentioned wellbeing and stress. Many are suffering in different ways. What kinds of things do you do to manage your own wellbeing? What kind of self-care strategies do you have?*

Manoj: That's a really good question. We asked ourselves this recently and a lot of us, me included, fall into this trap: you work and you go home. Unfortunately, the pandemic didn't really shift much of that routine for those working in health and social care. I don't play golf like most of my peers do. I've got two young girls of eight and ten years old. And if you ask me what keeps me sane and grounded, it's them. We go on bike rides, walk and really enjoy doing those kinds of things. That's what keeps me sane. It's family. ◪

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ADJUSTING TO MAJOR LIFE CHANGES

When stressful or traumatic life events come along, we all respond in different ways. One of these may seem counter-intuitive, that we can thrive and flourish following adversity. In this article, **Stephen Joseph** introduces the psychology of post-traumatic growth, with **Steven Shorrock**.

The past year has been a difficult one for many of us in so many ways. We have all been presented with challenges, whether it is keeping ourselves and our families safe, maintaining income to pay the bills, or looking after relatives in need of care. For those working in aviation, healthcare, education, and other sectors affected particularly badly by the pandemic, there have been significant – and for some traumatic – life changes. Many pilots, in particular, have had to put their careers on hold, or change them entirely. According to a global survey of 2,600 flight crew in partnership with Flight Global (2021), less than half of all commercial pilots are still flying for a living. According to the European Cockpit Association (ECA), over 18,000 pilot jobs are threatened or already permanently lost as of January 2021. The ECA noted that pilots on precarious atypical contracts and 'self-employment' were amongst the first to see their contracts terminated. Many others' lifelong vocational dreams have been put on hold or abandoned entirely.

It has taught us that although we spend our lives doing our best to avoid the tragedies and traumas of life, such things will befall most of us despite our efforts. It is important to have the right coping skills when things do happen to us, but one thing that seems particularly important is the ability to be able to use challenges in life as opportunities to become stronger and wiser in some way. I interviewed Terry Waite just over a decade ago when I was writing my book *What Doesn't Kill Us*, in which I explored this idea. Waite was a hostage negotiator who was himself kidnapped and held hostage from 1987 to 1991. One of the things he said was:

"Suffering is universal: you attempt to subvert it so that it does not have a destructive, negative effect. You turn it around so that it becomes a creative, positive force."

What a remarkable thing to say for someone who had survived four years in solitary confinement, being chained, beaten and subject to mock execution. What I was interested in was whether it is only the rare few who are able to manage adversity with such a positive outlook, or is this something that we are all capable of.

As I discovered in my research for the book, there are many scientific studies on how adversity is often a catalyst for positive changes. It is not uncommon at all. This is so much so that psychologists now even have a term for it: *posttraumatic growth*.

Posttraumatic growth refers to changes that cut to the very core of our way of being. First, relationships become deeper. People describe that they come to value their friends and family more, feel an increased sense of compassion for others and a longing for more intimate relationships. Second, people change their views of themselves in some way. For example, people develop in wisdom, personal strength, and gratitude, perhaps coupled with a greater acceptance of their

> "Posttraumatic growth refers to changes that cut to the very core of our way of being"

vulnerabilities and limitations. Third, people describe changes in their life philosophy. For example, we may find a fresh appreciation for each new day and re-evaluate our understanding of what really matters in life, becoming less materialistic and more able to live in the present. Often this involves new and deep appreciation of the spiritual aspects of life.

But posttraumatic growth can take time. When something happens, we might feel overwhelmed, with constant and troubling thoughts spinning around our minds about what happened, how things might have been different, and what we did or didn't do. This rumination can be destructive and interfere with our lives. We might just want to stay in bed and forget about everything, or find ourselves having a bit more to drink in the evenings than usual, or getting irritable with family and friends. Hopefully, those around us will understand what we are going through is something shattering. It is a reminder that we will need their support and understanding. If this period becomes prolonged and begins to seriously interfere with daily life, it is time to consider seeking professional help, but for most people such feelings will subside over time such that they don't feel completely overwhelmed.

"But it is in the midst of our suffering that there often comes a point at which we realise that ultimately it is up to us how we confront the challenges ahead"

All this can feel chaotic to a person and they can feel they are going out of control, but actually it is the mind's way of trying to make sense of what has happened. This can be illustrated through the metaphor of the shattered vase which I first introduced in *What Doesn't Kill Us*. Imagine that one day you accidentally knock a treasured vase off its perch. It smashes into tiny pieces. It is a total loss. What do you do? Do you try to put the vase back together as it was? Or do you pick up the beautiful coloured pieces and use them to make something new – such as a colourful mosaic? When adversity strikes, people often feel that at least some part of them – be it their views of the world, their sense of themselves, their relationships – has been smashed. Those who try to put their lives back together exactly as they were remain fractured and vulnerable. But those who accept the breakage and build themselves anew become more resilient and open to new ways of living.

Not for a moment do I wish to downplay the suffering that often follows, the sadness and grief of loss and bereavement, and the anxieties of an uncertain future that comes with job loss. But it is in the midst of our suffering that there often comes a point at which we realise that ultimately it is up to us how we confront the challenges ahead. When things happen to us, we can't just turn the clock back as if it hadn't happened, although often that is what we would like to be able to do. In order to adjust we have to accept the reality of what has happened and find a way to move forward.

And the more we can view adversity as a new beginning, or a new opportunity, the better for us. The key is to notice it. We can ask ourselves questions such as:

- Are there ways in which my relationships with family and friends have been strengthened and deepened in intimacy?
- Are there ways in which I have found a different perspective on life with new opportunities?
- Are there things I did to survive what happened that showed me strengths within myself that I didn't know I had?
- Are there ways in which I have found a greater understanding of life and how to live it?
- Are there ways in which I find myself being more grateful for what I have and for those around me?

If you answered yes to any of these questions, we would suggest taking some time just to think about and reflect on these changes in your life. It might be helpful to write about them in a journal and to make this a regular exercise. As you notice growth taking root, you can nurture it. Regularly ask yourself these questions and find ways to enact the changes you notice, even in the smallest ways. What I've noticed most of all is that posttraumatic growth offers people the opportunity to become truer to themselves, to be able to push aside some of the constraints they have felt put on them by others, and to find new ways of living that seem more real and genuine to them. It can be particularly hard when we lose our job as so much of who we think we are is often tied up in our job description. People will often feel adrift and lost for a while but for some it comes to be a defining moment for them when they realise how much of themselves they have invested in an employer and realise that they have an opportunity to do things differently now. Studies examining people whose careers have

been derailed have shown that for some it was a defining moment for them to find a new direction in life, temporarily or in the longer term.

Martin Bromiley, an airline pilot in the UK, experienced a traumatic event in 2005 that changed his life, and that of many others. His wife was admitted to the hospital for a routine elective procedure. *"After just over 20 minutes,"* he wrote in *HindSight* 25, *"Elaine was brain-dead. It would be another 13 days before she really was dead."* In response to the failings in healthcare, Martin founded the Clinical Human Factors Group (CHFG), which has – by many accounts – been responsible for a transformational shift in understanding of human and organisational factors in healthcare, perhaps helping to save many lives.

After the emergence of the pandemic, many flight crews have offered support to hospital staff (see Carpenter, *HindSight* 31). Others have offered support to peer wellbeing via several national schemes. Still others have turned their attention to helping to end the pandemic in different ways. After two decades as a pilot for the travel firm Thomas Cook, Christopher Bailey was left unemployed when the company collapsed in September 2019. He got a job at a COVID-19 testing site in the UK and was promoted to manager after just one month. His attitude is testament to growth: *"I think my transferable skills have been recognised – attention to detail, managing big picture situations, and overseeing things from afar, as well as being comfortable with very strict rules and procedures while having to manage a team"* (Shah, 2021).

We realise that what we have said here is not for everyone, but it may be worth some thought. We hope in sharing with you about the psychology of posttraumatic growth that you may find something useful to take away. ⑤

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THE SEVEN HABITS OF HIGHLY CONNECTED PEOPLE

In times of physical distancing, connectedness has been affected, but in many cases, communities have flourished. In this article, **Cormac Russell** reflects on what we might learn at work from 'connectors' in communities.

Do you know someone on your street, neighbourhood, or village who is much beloved by their neighbours? I do! In fact, I know lots. As a child it was my grandmother on my mother's side. From a very young age her effortless elegance in connecting with people fascinated me. She taught me the value of community building, of storytelling, of using what you have as a community to secure what's needed and of standing shoulder to shoulder with regular folks. She had no credentials, no fancy words to hide behind, and she was far from perfect. But she made a practice – a habit, you might say – out of connecting. It was her most important lesson to me.

Now, my own work is in community development, mostly outside of aviation organisations, but some of what I have learned applies to communities within organisations, such as communities of air traffic controllers, engineers, pilots, and other professionals. In every community, there are 'connectors'. It is likely that you know some in your organisation. They may be connectors within your 'professional community', or your 'airport community', or within the 'aviation community'.

What I have learned from working with communities from Rawanda to Roscommon in Ireland, and from my grandmother to savvy relationship builders in organisations around the world, is that you can't be effective until you learn to be affective. Being affective is about understanding that you can't fix the technical stuff until you attend to human relationships.

This is the realm of connectorship. Studying connectors, as I have done over 25 years in 36 countries, has revealed several characteristic habits. As you read on, I invite you to think about the people in your 'community' who fit the description, and perhaps about how you might expand your own connecting ability. By the way, a health warning for folks who like to move fast: this may not appeal to you. It may feel soft or a bit too touchy-feely. I make no apology for this. These folks move slow and support others to make things. I believe they have something of great value to teach us. See what you think:

1. They name what they and what others do

Highly connected people name what they do and what others do. They are therefore predicable and help others become predictable too. They have probably been communicating on the basis of the belief that it's good to name your initiatives and those of others since they were children.

There is no manipulation here, just gentle magnetism that comes from an ability to name what you care about and want to act on, without feeling the need to convert everyone to agree with or follow you. They don't just name what they do, or want to do. They name what others are doing. This disarmingly simple act is done without judgment and often in an effort to connect with someone else. *"Anna, did you know that Peter from engineering loves cooking. Don't you organise the annual BBQ?"* Then they smile, and a twinkle appears in the corner of their eye. Simple, but like magic, topped off with: *"I think you'd make good friends."*

A neighbourhood in Tulsa, Oklahoma, has long been known as "Brady Heights". Several years ago, details about Mr. Brady's history came to light, prompting a need for a new name. As a first step, some have collected stories and dug into the neighbourhood history, bringing diverse neighbourhood voices and transparency to the renaming process.

"Highly connected people name what they do and what others do"

2. They wait patiently

They wait. Imagine the joy of encountering someone who knows the value of creating the time and space where you can figure stuff out, wrestle with dilemmas, and come face to face with what you really care about and feel energised to act on. No sales pitch, no nudging, recruiting, coaching, or inspiring, just…waiting. In every neighbourhood, people with such a habit exist. I think it's a habit worth seeking out; it may well be the best-kept secret of all. In communities, such as yours, anything worth doing takes time and patience.

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"Connectors take somebody
from seeing only deficits and
problems to seeing strengths and
possibilities"

In Rwanda, three connectors have worked with parents from 49 schools to connect with over 400 villages in the Gasebo district to connect the assets of local communities and schools to address child poverty, sanitation issues and drought.

3. They hear others into expression and action

'Hearing people into expression and action' is a third habit of highly connected people. They are much beloved for this wonderful gift for creating just the right ambiance to better express ourselves and connect with others, leading to productive action. It is as if their listening activates us. Their listening is laced with curiosity, and their primary interest is not your opinions on what everyone else ought to do. Their primary interest is what motivates you. They have an innate understanding of the three things that motivate people to take action:

- what they care about and therefore want to move towards
- what they are concerned about and therefore want to move away from, and
- the opportunity to contribute a gift, skill or talent.

Yet when they listen for these things, they do so not in an effort to get us to act as they see fit, but simply to enable us to better express ourselves and connect with others. Do you know anyone like that?

In the neighbourhood of Hodgehill in Birmingham, England, seven street connectors have spent the last seven years knocking on their neighbours' door, asking questions like "what would you love to do here if three or four of your neighbours were willing to help you?" The interesting thing is that people have answers, they have ideas. It is as if they have been waiting to be asked.

4. They follow our initiatives

One way of thinking tries to subdivide us into two camps: those who lead and those who follow. But there are so many other ways of being in the world, including being a 'connector' – someone who connects the gifts, wants and offers of others. Connectors step back and light up a space into which we can step and make a valuable contribution to the wider community. They help people to catch themselves doing the very thing they think they 'can't' or 'don't' do.

In the South Central Neighbourhood in Singapore, the Family Centre staff reversed an age old question that they would ask residents, "what do you need from us", to "what are you already doing that makes things better and what else would you like to do?" Out of this new question emerged the insights that people are doing a lot of stuff below the radar to support their families and communities, and it's mostly either invisible or not valued. An initiative called "I Wish You Enough" emerged. This initiative is a community-led way of ensuring families living in poverty have enough to live well. Practical cooperative efforts include seven families pooling their monthly food budgets and then buying groceries in bulk at a wholesalers.

5. They focus on assets

When a neighbour says they are worried that their 13-year-old daughter is going down the *"wrong road, falling in with the wrong crowd"*, a highly connected neighbour listens to that, and then does something counterintuitive. At just the right moment, having waited and heard the person, they don't join in the moaning, but instead follow what the person has said that they care about. And with that they ask questions, at the speed of trust, not in quick fire, that only a highly connected person can ask: *"So Mary, you know how you said you're worried that Jane is going to go down the wrong track, and because it's coming close to the summer holidays you're even more concerned? Is that something you'd like to move forward?" "What could you bring to the solution?" "Do you know others who could join you?" "How can I be useful?"* Then they wait, and wait some more, as Mary looks inside of herself to find what gifts, skills, knowledge and passions she has within her grasp to act on what she cares about.

Connectors take somebody from seeing only deficits and problems to seeing strengths and possibilities. I'm sure you can think of many other examples at work, where a problem could be – or has been – turned into possibility, realised by you and your colleagues. This is the 'BY' mode of change outlined in my article in *HindSight* 28 – change done BY people, not FOR them.

6. They connect people's gifts, skills and passions

As well as helping people tap into their own potential, they understand the power of connecting people together by gifts, skills and passions. Highly connected people are connected because they connect people to each other. But that's not their primary motivation. They are not networking out of self-interest. They connect people because that is what they love to do.

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Using the example above, as well as helping Mary shift from a deficit- to a strength-based perspective, they go further and transform the conversation into an asset-based learning conversation. They help Mary to use her connections as well as her personal skills, *"I wonder who else might help?" "Sally, four doors up has talked about this, she's always saying that there's nothing for girls to do, and all the activities are geared for boys. And Mike is raising two daughters on his own, I bet he'd have something to say, do you know anyone else?"*. Mary: *"Come to think of it…"*

Instinctively they know that there are three kinds of assets:

1. *Primary assets* that are local and within community control that just need to be identified, connected and mobilised (e.g., air traffic controllers can get together informally without managerial approval in an organisation).
2. *Secondary assets* that are local but not within community control, and therefore require more complex negotiation (e.g., pilots can organise safety workshops, but need managerial approval in an organisation).
3. *Potential assets* that existing outside of the community and outside community control (e.g., controllers can organise safety workshops with pilots and ground staff, and tour an airfield to understand ground safety issues, and need managerial approval from various organisations).

Highly connected people have a habit of guiding people through a thinking process that helps them explore how primary assets can be used first, then they are mobilised to start thinking about tapping into secondary assets and so on.

In a neighbourhood in the Netherlands, Joop lives with his mother. Some know him as a person with mental health issues. He has a fear of open space and social interactions. So he rarely goes outside. When we first met his mother and him, they were both disconnected. The conversation turned from Joop's deficits to his capacities and interests. He is a keen stamp collector and loves plants. Today he is the guy that looks after neighbours' plant when they go on vacation.

7. They grow their power by giving it away

Highly connected people work through connections, not hierarchies. It is important to make a distinction here between a networker and connector. A networker is much more likely to use language such as: *"my network", "I use my network to.."*, and *"it's not what you have, it's who you know that counts"*. A networker has clear self-interest in engaging and investing in their networks, and will happily reciprocate but expect something in return.

Connectors are more likely to use 'our' and 'we' language: *"we just get together on our street, at the drop of a hat"* or *"our book group"*. They also tend to describe what others do for others, rather than what others do for them. Connectors don't tend to think of themselves as 'networked'. They think of themselves as connected deeply with, and in, the lives of others in their community.

In simple terms, I would say networkers invest in multiple interpersonal relationships; some are deep, but the wider the network the more surface level many of the relationships are. Connectors by comparison may not know as many people, since they are driven by depth in their relationship and by the desire to connect the people they know to each other.

Connectors tend to feel powerful when people who were disconnected become connected, especially as those connections deepen and the associations spread. They feel joy at the idea that a culture of community is taking hold.

So did you think of people in your professional or work 'community' who fit the description above, perhaps in the control room or for professional association? Perhaps it's you. Either way, we can all expand our own connecting ability. ▪

Cormac Russell is Managing Director of Nurture Development (www.nurturedevelopment.org) and a faculty member of the Asset-Based Community Development (ABCD) Institute at DePaul University, Chicago. He is the Director of ABCD in Europe. He is the author of 'Asset Based Community Development (ABCD): Looking Back to Look Forward' and 'Rekindling Community: Democracy Redefined'.

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WHY WON'T WORKERS SPEAK UP?

THE DIFFERENCE BETWEEN PSYCHOLOGICAL SAFETY AND TRUST

In some sectors, 'the new reality' may mean a loss of experienced front-line professionals. What might be the effect of this on speaking up in problematic situations? **Nippin Anand** offers insights from Costa Concordia in the context of changes in the shipping industry, suggesting that 'psychological safety' only gets you so far: competency is key for trust.

KEY POINTS

- The concept of 'psychological safety' has been proposed to explain why people do or do not speak up to someone higher up in hierarchy, even when faced with an imminent threat.

- Freedom to speak up is an old issue covered for decades in crew resource management training and practice.

- Staff shortages and increased demand can result in mass recruitment at the entry level, with a consequent loss of expertise.

- Speaking up relies not only on a willingness to speak up, but the competency to know what to say, how and when. Recruitment and training must address both issues.

In March 2017, I travelled to Sorrento to meet with Francesco Schettino, the captain of the passenger ship Costa Concordia that capsized off the coast of Italy. I was plainly curious to understand his perspective about the accident. During our four days of interaction, I discovered that Francesco had a strong opinion about why people don't speak up even when there is an imminent danger. His theory was that they simply cannot comprehend the situation. In other words, how do you speak up if you do not know what to say?

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"Not surprisingly, many disasters have traditionally been attributed to a reluctance to 'speak up', even in the face of a clear and present danger"

I was left disturbed by the idea. It appeared naïve and oversimplistic. How could it be possible? Dominant theories and prominent experts have not focused on this, so who was this man to make such a bold statement? What did he know about human factors and, above all, why should I even trust someone who has such a low credibility in public face?

Psychological Safety in High-risk Industries

In high-risk industries, the dominant view of why people do not speak up to someone higher up in hierarchy, even when faced with an imminent threat, is the absence of 'psychological safety'. In the words of Professor Amy Edmondson psychological safety *"is a belief that one will not be punished or humiliated for speaking up with ideas, questions, concerns or mistakes".*

Conversely, when people don't speak up, voice their concerns or opinions, go along with the most powerful voice in the room, feel humiliated, ridiculed, or abused in a risky situation – these are all considered signs of a psychologically unsafe space.

In high-risk systems, professionals regularly make decisions under time pressure, work with missing information, face unclear goals and perform under varying conditions. Typical examples include the aviation, health, maritime, oil and gas, and nuclear sectors. The hierarchical organisation of teams means that people in lower ranks sometimes feel reluctant to voice their concerns. Not surprisingly, many disasters have traditionally been attributed to a reluctance to 'speak up', even in the face of a clear and present danger. Air accidents sometimes fall into this category and the explanation goes something like this:

1. The disaster occurred because the co-pilot did not question the judgement of the captain.
2. The co-pilot knew the correct course of action.
3. The co-pilot didn't speak up because he was psychologically incapable of questioning authority.
4. If the co-pilot had spoken up, the crash would not have happened.
5. We now train co-pilots to speak up and have created protocols to facilitate this and punish them for not doing so.
6. As a result of this, these kinds of human error accidents will not occur.

The solution proposed is to encourage people in lower ranks to be assertive and challenge those in a position of power. To create a safe workplace, errors should be detected and reported upwards. Despite four generations of crew resource management (CRM) courses in the aviation world (and now in wider industries), we remain trapped in the same deadlock. There is some truth to it but is it that simple?

The Bad-tempered Captain

Back to the Costa Concordia case. The argument that the junior officers were often terrified because of the Captain's presence on the bridge came up on various occasions in my research. Some seafarers who have worked with Francesco and have attended my workshops even called him a 'bully' or a 'monster'. One of his shipmates expressed being shocked upon hearing the news that Francesco was being promoted as a ship captain by the company.

But accident investigations can be a relentless hunt for the bad apple, and for simple explanations. That the captain with a strong character can become a 'cause' is a lazy explanation, and I have difficulties buying into this argument. It tells us nothing about the situation or the conditions at work. But even if we were to accept such an explanation, the thought that the safety of a multi-million-dollar ship carrying more than four thousand passengers and crew is contingent upon the temperament of a single person should be worrying for any organisation in the business of high-risk operations. Francesco had an accomplished career and was promoted through ranks to become a ship captain.

Should someone whose disposition causes so much concern to his colleagues be promoted to the highest rank? What does this tell us about the peer evaluation processes and the organisational structure in general?

Competence and Trust

The Costa Concordia case provides an opportunity to rethink why people don't speak up in high-risk systems. It became evident during our research that the problem is far more deep-rooted. The data from the Cruise Line International Association revealed an unprecedented increase in both the supply and demand for cruise ships between 2003-2013. The global demand for cruise ships increased by 77%, and within Europe as much as 136%. Similarly, the global supply of cruise ship capacity increased by 84%; in the Mediterranean alone, it surged up to 160%. Understandably, all this led to an acute shortage of staff in the cruise sector.

The operators responded by expediting the training process and sea staff were promoted faster than usual. Mass recruitment at the entry level meant that young seafarers with limited work experience were having to work alongside seafaring professionals with extensive work experience.

"There could be a lot of psychological safety in the space, but trust may still be absent between the team members"

When this happens, speaking up is no longer simply a matter of mustering courage or owning mistakes. It is about the expertise to understand and deal with novel situations and the ability to operate as one team. Without this, the leader of the team finds it difficult to trust team members to perform their duties independently. In short, the issue is of competence and training standards of new entrants, and it is the problem of an entire industry. With many experienced pilots having left the cockpit for good, might we see the same in aviation on restart?

"People need the knowledge and skills to recognise and understand problems"

At the time of the accident, the most senior officer onboard the Costa Concordia was almost half the age of the captain and with significantly less work experience. Similar patterns emerge when we examine accidents in other high-risk systems. In the case of the Ethiopian Airlines flight, the co-pilot had clocked a mere 200 hours of flying experience, alongside a pilot with 8,000 hours. And in the case of MH 370, the co-pilot was on his first flight aboard a Boeing 777 as a fully approved pilot and it was his first assignment without a training pilot overseeing him. These accidents may reveal an interesting insight about how teams within high-risk systems are organised.

Trust that is otherwise kept intact between team members during critical operations to guide, steer, approve and challenge one another's actions and decisions goes out of the window when the required level of competence is missing in the team. Though in-charge, the leader needs input from other members of the team to perform successfully. But in hours of crisis or during non-routine tasks, there is no back-up and no one to fall back upon. At the opposite end, the subordinate wants to speak up and raise his or her concerns to the leader but is ill-prepared for the situation. Preparing entry-level recruits for high-risk operations, singling

out areas of concerns, escalating issues and earning the trust of team members requires quality education and training that maritime institutions operating in deregulated markets are not geared up to handle. And all this leads to a breakdown of trust between team members.

There is a good chance that the subordinates' concerns will not be taken seriously by experienced members of the team because of his or her perceived lack of competence. This implies that there could be a lot of psychological safety in the space, but trust may still be absent between the team members. Once again, a systemic problem calls for policy-makers and leaders to revisit their business and skill strategies, not another training course focused on seafarers to manage power relations at work. The question we asked at the outset – *why won't they speak up?* – loses meaning. Perhaps a more meaningful question would be to ask, *what should they say, how and when?* And, crucially, *how will they know what to say?*

Summing Up

Across high-risk industries, the ability to perform as expected from an individual (and a team) under varying conditions and novel situations should still be placed at the heart of competence development programs. People need the knowledge and skills to recognise and understand problems. There are clearly benefits in enhancing the non-technical skills of professionals so long as such initiatives do not become a replacement for competence development.

This is not to say that psychological safety is an unhelpful construct. On the contrary, it is a very helpful concept in most aspects of work such as planning, pre-briefing and debriefing, and meetings. The point is to understand the distinction between the issue of competence and trust between team members on the one hand, and psychological safety within a team on the other, and to realise when not to overuse the latter.

Nippin Anand PhD is the Founder of Novellus Solutions Limited, a specialist in human factors and safety and a former Master Mariner with a PhD in Social Sciences. His research interests include applied sciences, storytelling, cultural anthropology and safety management.

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EUROCONTROL IANS COURSES

The EUROCONTROL Institute of Air Navigation Services (IANS), located in Luxembourg, develops and delivers Air Traffic Management Training, Services and Tools for Air Navigation Service Providers, Airlines, Training Organisations and Civil and Military State Authorities worldwide. Building on over 45 years of expertise, the Institute provides a wide range of training courses, services and tools – from general introduction courses on ATM concepts through to advanced operational training. Here are some courses that may be of interest to readers on the topic of The New Reality.

Introduction to TRM [HUM-TRM-INTRO]

Team Resource Management (TRM) focuses on operational human performance and teamwork in ATM operations. It explores the gap between "Work as Imagined" and "Work as Done" in human factors terms. When implemented effectively, TRM zooms in on the things that go well during daily ATM operations and facilitates ways to replicate this success. It encourages the exchange and understanding of operational pitfalls and strengthens the human safety net.

The course supports ATM stakeholders who are considering implementing TRM within their organisation. Not only does it cover TRM concepts and theory, it also deals with the "how to" questions that arise when setting up the organisational TRM activities, including logistics and training of TRM facilitators.

This course provides a good foundation for planning the implementation of TRM or HF program in ATCO continuation training.

Important Note
This course is virtual classroom alternative for the existing classroom HUM-TRM-A course.

Duration
This course takes place over 3 days. You will have 3 virtual sessions. You need to plan 9 hours to complete this course.

Objectives
After completing this course, participants will be able to:

- Explain the TRM concept
- Describe the benefits of TRM to the operational environment
- Describe the methods used to carry out TRM activities
- Describe how TRM fits into EU Commission Regulation 2015/340

Audience
This course is designed for ATM professionals with a good understanding of operational matters that are interested to learn about TRM programme.

Systems Thinking for Safety [HUM-SYS-V]

To understand and improve the way that organisations work, we must think in systems. On this course, participants will explore systems thinking for safety to help make sense of, and improve system performance.

The HUM-SYS course is delivered in a workshop format and provides a background understanding for the majority of the existing SAF and HUM Domain courses.

Important Note
This course is virtual alternative to the existing classroom HUM-SYS course.

Objectives
The course will explore concepts of safety and systems, perspectives of the people in systems, system conditions, system behaviour and outcomes.

Duration
This course takes place over 3 days. You will have 3 virtual sessions. You need to plan 12 hours to complete this course.

Audience
The course may be of interest to reach anyone involved in trying to understand or intervene in complex sociotechnical systems.

Virtual Classroom Instruction [HUM-VCI]

The new guidance for allowing virtual classroom instruction and distance learning published by EASA is addressed to Competent Authorities and European aviation training providers, with the aim of ensuring continuity of the planned initial and recurrent theoretical training at the time of pandemic.

Important Note
Here are a few important points to consider before registering for this course:

The HUM-VCI is a practical course. We will train you first and then will ask you to deliver a lesson. Please think in advance about what you want your lesson to be about. Later in the course you will be given sufficient time to prepare; but it is always good if you already have an idea on the topic you want to teach.

Please expect 1 brief written exam. Additionally, the practical delivery of your lesson is assessed. The only questions we will ask you; will be the ones we will teach you during the course.

Duration
This course takes place over 5 days. You will have 5 virtual sessions. You need to plan 17 hours to complete this course.

Objectives
With this course we aim at supporting the course participants in tailoring their online presentations and lessons. After completing this course, participants will have hands-on experience of delivering short theoretical training online in lesson format. They will be asked to prepare and design, develop and deliver a lesson lasting up to 20 min. Participant's sessions are debriefed, based on set guidelines.

Audience
This course is appropriate for colleagues who will be asked to design, develop and deliver theoretical training online (virtual classroom) for ATM staff and/or presentation on ATM related events.

A selection of other courses relevant to The New Reality

- Introduction to the effects of Stress [HUM-STRESS] (2 hours)
- Principles and tools for measuring and managing fatigue [HUM-FMT] (3 virtual sessions over 3 days)
- Fatigue awareness for ATM Managers [HUM-FAT-MGT] e-Learning Course (1 hour)
- Basics of Human Factors for Safety [HUM-HFA-INTRO] (5 virtual sessions over 5 days)
- Design and Assessment of Systems Using Human Centered Approaches [HUM-DESIGN-V] (4 virtual sessions over 4 days)
- Integration of Human factors in ATM projects with the HF case process [HUM-HF-CASE-V] (4 virtual sessions over 4 days)
- Theory of ATC Simulation Exercises and Courses Design [HUM-SIM-B] (4 virtual sessions over 4 days)
- Controller Competency Assessor - Refresher [HUM-CCA-R-V] (5 virtual sessions over 5 days)
- Practical Training Instructor Skills for OJTI and STDI - Refresher [HUM-OJTI-R-V]

Check the prerequisites and dates for each course, and register at EUROCONTROL Training Zone. **https://trainingzone.eurocontrol.int/**

JUST CULTURE MANIFESTO

In November 2020, EUROCONTROL launched the Just Culture Manifesto, bringing the concept of just culture to all. Hundreds have already signed up to the five commitments. Join us!

Introduction

"Just Culture" is a culture in which front-line operators and others are not punished for actions, omissions or decisions taken by them which are commensurate with their experience and training, but where gross negligence, wilful violations and destructive acts are not tolerated.

Organisations are run by people. In tens of industries – transportation, healthcare, energy, internet, and more – thousands of occupations, and millions of organisations around the world, it is people who make sure that things normally go well. And they nearly always do.

But sometimes, things go wrong. Despite our best efforts, incidents, accidents and other unwanted events happen. Following such events, there is a need for support and fairness for those involved and affected, and learning for organisations, industry and society as whole. In the absence of intentional wrongdoing or gross negligence, these obligations should not be threatened by adverse responses either by organisations or States.

The goals of this Just Culture Manifesto are to:

- articulate a vision of just culture that connects with people from all industrial sectors, around the world;
- speak to people in all roles – front line, support, specialists, management, both in private industry, government organisations and departments, and the justice system;
- provide a framework for other people to advance this vision of just culture.

As referred to in the Just Culture definition, only a very small proportion of human actions is criminally relevant (criminal behaviour, such as substance abuse or misuse, grossly negligent behaviour, intention to do harm, sabotage, etc.). Mostly, people go to work to do a good job; nobody goes to work to be involved in an incident or accident.

Five Commitments

We have distilled five commitments that we believe are critical for Just Culture and the need to balance safety and the administration of justice.

1. **Ensure freedom to work, speak up and report without fear:** People at work should feel free to work, speak up and report harmful situations, conditions, events, incidents or accidents without fear of unfair, unjust or unreasonable blame or punishment. Unfair, unjust or unreasonable blame or punishment does not motivate people to do a good job, nor to avoid 'human error'. Instead, it reduces cooperation, trust and reporting, prevents innovation, and adversely affects healthy judgements about risks that are part of everyday work. Rather than making people afraid, we all need to contribute to an environment where people can work and provide essential safety-related information to improve how the organisation works. While we aim for free and open reporting, people who report must be confident that their identity, or the identity of any person implicated, will not be disclosed without their permission or unless required by law – at any stage of the reporting, investigating and learning process.

2. **Support people involved in incidents or accidents:** The organisation must support people who are involved in or affected by accidents. This is the first priority after an unwanted event. Accidents can be traumatic experiences for all involved. People may be distressed or injured, physically or psychologically. Support for people is therefore the first priority after an unwanted event. While adverse events such as accidents are uncomfortable and often distressing experiences, the learning process should not be. Safety investigations and organisational learning activities concerning unwanted events should – as far as possible – be positive experiences for all involved, improving the design of the system, helping individuals, teams and the organisation to grow and become more resilient, and repairing – as far as possible –any damage done.

3. **Don't accept unacceptable behaviour:** Gross negligence and wilful misconduct are very rare, but cannot be tolerated. The above commitments do not mean that 'anything goes'. There must be constant discussion about the right professional behaviour and the consequences when professional boundaries are crossed. And nothing should prevent criminal prosecutions in the event of intentional wrongdoing or gross negligence; this is a matter for the judiciary.

4. **Take a systems perspective:** Safety must be considered in the context of the overall system, not isolated individuals, parts, events or outcomes. The system is the main influence on performance. The system comprises human, technical, informational, temporal, social, political, economic and organisational components. These include goals and targets, demand, resources, constraints, incentives and reward systems, measures, work organisation, the work environment, and so on. The focus of the investigation and improvement will normally be on these system elements, and how they interact.

5. **Design systems that make it easy to do the right things:** Improving safety means designing ways of working that make it easy to do the right thing and hard to do the wrong thing. This design process should be a collaborative and constructive process that empowers those involved and affected as co-designers to help improve the system.
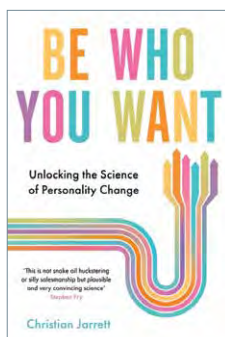
Join us!

These commitments will not come to life on their own. People need to commit to them and make them a reality in organisations and societies. We are committed. We hope you are too.

We invite all who support the principles in this Manifesto to join us, and to help make Just Culture a reality in all countries, industries, and occupations.

If you agree and are willing to support these commitments, sign up and learn more about who else signed the Just Culture Manifesto on SKYbrary at www. bit.ly/JCManifesto ↘

If you want to read more about some of the issues raised in this issue of HindSight, then these books might be of interest.
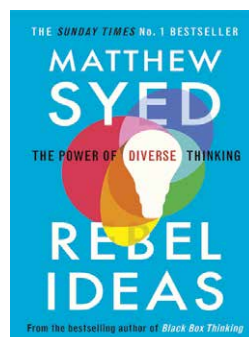
Be Who You Want, by Christian Jarrett (2021),

From the publisher: "Be Who You Want argues that contrary to the old adage, not only can the leopard change his spots, he can swap them for stripes, and that he can do so to his own advantage. In psychological terms, although our initial personality type is moulded by a combination of genetic influences and early experiences, it is not fixed. It's malleable, voluntary even. This book will tell the story of how our personalities are formed and gives us the tools to shape them in the ways which we desire and which will benefit us most. Drawing on the latest psychological theories and methods, interviews with leading experts, as well as personal anecdote, Christian Jarrett shows us that we can shape ourselves in ways that make our lives better. The book provides evidence-based ways to change each of the main five personality traits, including how to become more emotionally stable, extrovert and open-minded. It also delves into the upsides of the so-called Dark Triad of personality traits - narcissism, Machiavellianism, and psychopathy - and how we might exploit their advantages without ourselves going over to the dark side."

"The good news is that personality is a skill, and like all skills, we can improve. In this optimistic book, you'll discover what's possible - if we care enough to change." (Seth Godin, author, The Practice)
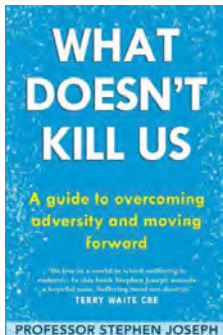
Rebel Ideas: The Power of Diverse Thinking, by Matthew Syed (2020)

From the publisher: "Where do the best ideas come from? And how do we apply these ideas to the problems we face - at work, in the education of our children, and in the biggest shared challenges of our age: rising obesity, terrorism and climate change? In this bold and inspiring new book, Matthew Syed - the bestselling author of Bounce and Black Box Thinking - argues that individual intelligence is no longer enough; that the only way to tackle these complex problems is to harness the power of our 'cognitive diversity'. Rebel Ideas is a fascinating journey through the science of team performance. It draws on psychology, economics, anthropology and genetics, and takes lessons from a dazzling range of case-studies, including the catastrophic intelligence failings of the CIA before 9/11, a communication breakdown at the top of Mount Everest, and a moving tale of deradicalization in America's deep South. It is book that will strengthen any company, institution or team, but it also offers many individual applications too: the remarkable benefits of personalised nutrition, advice on how to break free of the echo chambers that surround us, and tips on how we can all develop an 'outsider mindset'. Rebel Ideas offers a radical blueprint for creative problem-solving. It challenges hierarchies, encourages constructive dissent and forces us to think again about where the best ideas come from."

"On a vital and still-overlooked topic, Matthew Syed has assembled a compelling base of evidence from a wide range of scientists. If that sounds intimidating, don't worry: Syed is a superb storyteller. I couldn't put the book down, and I learned so much. A stunning achievement." (The Undercover Economist)
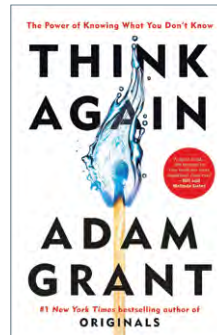
What Doesn't Kill Us: A guide to overcoming adversity and moving forward, by Stephen Joseph (2013)

From the publisher: "Research has shown than anywhere from 30 to 90 per cent of people confronted by tragedy, horror and adversity emerge as wiser, more mature and more fulfilled people, sometimes despite great sadness. Relationships become stronger. Perspectives on life change. Inner strengths are found. For the past twenty years, Stephen Joseph has worked with survivors of trauma and sufferers of posttraumatic stress. In this groundbreaking book, he boldly challenges the notion that trauma and its aftermath devastate and destroy the lives. His studies have shown that a wide range of traumatic events - from illness, separation, assault and bereavement to accidents, natural disasters and terrorism - can act as catalysts for positive change, strengthening relationships, changing one's perspective and revealing inner strengths. In What Doesn't Kill Us, Stephen Joseph shares the six steps we can all use to manage our emotions and navigate adversity to find new meaning, purpose and direction in our lives."

"We live in a world in which suffering is endemic. In this book, Stephen Joseph sounds a hopeful note. Suffering need not destroy." (Terry Waite CBE)

Think Again: The Power of Knowing What You Don't Know, By Adam Grant (2021)

From the publisher: "Discover how rethinking can lead to excellence at work and wisdom in life. Intelligence is usually seen as the ability to think and learn, but in a rapidly changing world it might matter more that we can rethink and unlearn. Organizational psychologist Adam Grant is an expert on opening other people's minds-and our own. As Wharton's top-rated professor and the bestselling author of Originals and Give and Take, he tries to argue like he's right but listen like he's wrong. Think Again invites us to let go of views that are no longer serving us well and prize mental flexibility, humility, and curiosity over foolish consistency. If knowledge is power, knowing what we don't know is wisdom."

"Think Again is a must-read for anyone who wants to create a culture of learning and exploration, whether at home, at work, or at school. With warmth and humour, Adam Grant distils complex research into a compelling case for why each of us should continually question old assumptions and embrace new ideas and perspectives. In an increasingly divided world, the lessons in this book are more important than ever." (Bill and Melinda Gates)

Would you like to write for HindSight magazine?

HindSight is a magazine on human and organisational factors in operations, in air traffic management and beyond.

As such, we especially welcome articles from air traffic controllers and professional pilots, as well as others involved in supporting them.

Here are some tips on writing articles that readers appreciate.

1. Articles can be around 1500 words (maximum), around 1000 words, or around 500 words in length. You can also share your local good practice on what works well for you and your colleagues, on the theme of each Issue, in up to 200 words.

2. Practical articles that are widely applicable work well. Writing from experience often helps to create articles that others can relate to.

3. Readers appreciate simple and straightforward language, short sentences, and concepts that are familiar or can be explained easily.

4. Use a clear structure. This could be a story of something that you have experienced. It helps to write the 'key points' before writing the article.

5. Consider both positive and negative influences on operations, concerning day-to-day work and unusual circumstances, sharp-end and blunt-end.

If you have an idea for an article that might be of benefit to others, we would like to hear from you.
Please write to **steven.shorrock@eurocontrol.int**

HindSight
Human and organisational factors in operations

The theme for HindSight 33 will be

DIGITALISATION AND HUMAN PERFORMANCE

HindSight is a magazine on human and organisational factors in operations. The magazine is aimed primarily at operational staff, but also at other practitioners, in air traffic management and beyond.

We welcome articles and short contributions by Friday 16 October 2021.

We especially welcome articles written by or with operational staff on any aspect of digitalisation and its implications for human performance, for example:

- specific technologies and the implications for human performance, e.g.:
  - mobile, terrestrial and satellite-based communications.
  - artificial intelligence and machine learning
  - virtual centres and remote towers
  - video surveillance
  - swarm intelligence
  - big data analytics
  - synthetic and enhanced sensor technologies
  - cloud computing and cloud architecture
  - speech recognition
  - virtual and augmented reality
- cybersecurity and human performance
- autonomy and human performance
- human-centred design for operational staff
- organisational implications affecting operational staff
- overreliance and trust in technology, and
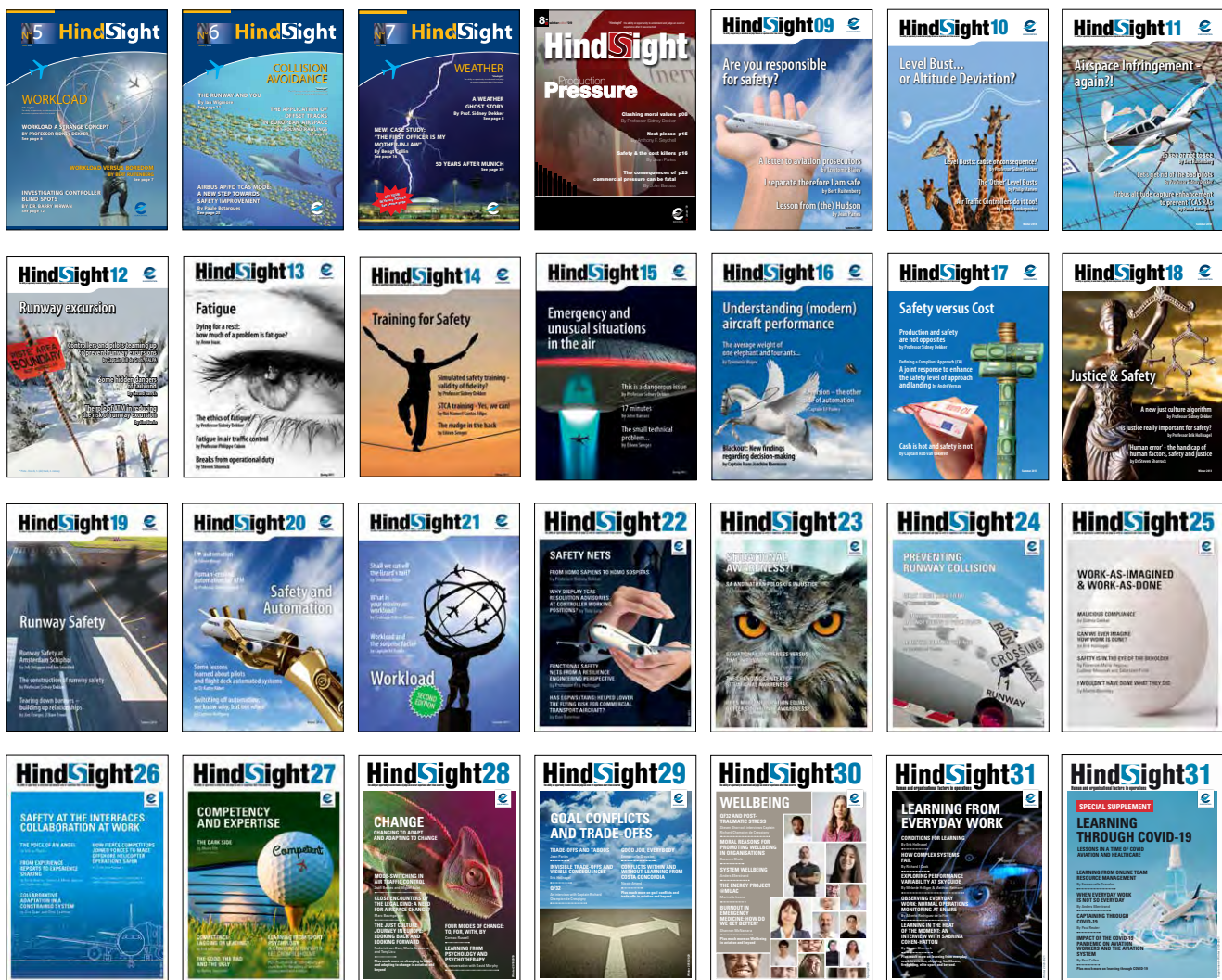- the changing roles of operational staff.

Articles may include new developments, stories and lessons from operational experience, including what has worked for you, and what has not.

Draft articles (1500 words maximum, but may be around 1000 or 500 words) and short examples of experiences or good practice (that may be helpful to other readers) (200 words maximum) should:

- be relevant to human and organisational performance in air traffic management
- be presented in 'light language' keeping in mind that most readers are operational staff in ATM, and
- be useful and practical.

Please contact **steven.shorrock@eurocontrol.int** if you intend to submit an article, to facilitate the process.

In the next issue of HindSight:
"DIGITALISATION AND HUMAN PERFORMANCE"