

# THE LEADING EDGE

s a f e t y a t t h e f o r e f r o n t

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## Staying on Course

Last year, CAAS moved ahead with the modernisation of the legislative framework for aviation safety. The necessary amendments to the Air Navigation Act were passed by the Parliament in February 2014 to enable the transition from the current Air Navigation Order regime to a Parts system that is in line with internationally recognised frameworks. The Parts system will allow CAAS to better support future growth and development of the aviation industry as regulations are grouped into logical Parts, each addressing a specific area.

The various Parts are being developed in accordance with a roadmap and will gradually replace current provisions in the Air Navigation Order. Parts relating to air operations are expected to be promulgated in the middle of 2014 and come into effect three months later. This will be followed by the Part on continuing airworthiness early next year. Notably, industry working groups have been established over the last two years to support the development of these Parts, and we will continue to work closely with the industry on the transition to the Parts system.

To keep pace with developments in the aviation industry, CAAS introduced a number of rule changes last year. We reviewed the impact of portable electronic devices on flight safety and relaxed their onboard usage to meet travellers' needs. To allow approved maintenance organisations greater flexibility in deploying their manpower, we

extended the privileges of avionics aircraft maintenance engineers to include certifying work on integrated electrical and avionics systems in newer types of aircraft. We also strengthened existing regulatory frameworks to address airside safety and foreign carrier operations at Changi and Seletar airports.

Moving ahead into 2014, we will maintain our focus on operational safety, paying close attention to the top three priority areas identified by ICAO under its Global Aviation Safety Plan, i.e. runway safety, loss of control in flight and controlled flight into terrain. We will continue to take part in regional and international discussions and work with industry partners to develop and implement safety enhancement initiatives in these three areas. Clearly, as our industry expands and air traffic volumes increase in Singapore, all of us in the aviation community must maintain vigilance and strengthen our safety performance.

On the safety oversight areas, we will be enhancing our risk-based approach in safety surveillance to improve the effectiveness of our regulatory activities, and reduce regulatory burden on the industry. In addition, this year, we are looking at incorporating competency-based elements in the training requirements of pilots and medical examiners, and working with air



operators in the implementation of Fatigue Risk Management Systems.

Amidst the buzz of activities and vibrancy of the industry, I look forward to working with you to build a strong safety culture. On this note, "The Leading Edge" is in its third year of publication and I hope you have found it useful. We thank you for your feedback which will help improve the publication and ensure its relevance to the aviation community. ■

**Tay Tiang Guan**  
Deputy Director-General  
Civil Aviation Authority of Singapore



## Managing the Impact of Weather on Aviation Safety

Adverse weather has been a contributing factor in almost 30% of the world's aviation accidents involving commercial flights since the 1950's. In Singapore, while the weather may be relatively mild, it still has a significant effect on aviation. At a CAAS Safety Series seminar on "Managing Weather Impact for Safe Aviation", Mr Magnus Teo, Air Traffic Control Manager at CAAS, highlighted that bad weather is the main cause for flight diversions and delays at Changi Airport. Strong wind shear and heavy rain contributed to about 40% of the missed approaches occurring at Changi Airport in 2011 and 2012. The presence of inclement weather also often disrupts Air Traffic Management (ATM) and increases the workload and stress of the air traffic controllers.

Participants including pilots, air traffic controllers and meteorological personnel gathered at the seminar agreed that weather is not something we can leave to chance. Aviation planners and operators should pay greater attention to managing the impact of weather. Some of the solutions offered to manage this include avoiding hazardous weather through the use of advanced weather detection technology in aircraft and strengthening weather training for relevant personnel.

In addition, speakers suggested that apart from the need to have accurate and timely weather reports, these reports should also be integrated into ATM systems so as to enhance decision-making. The good news is that ICAO has adopted the Aviation System Block Upgrades with meteorological modules embedded to work towards global harmonisation and inter-operability of meteorological services supporting a global ATM system. Recent enhancements made to ICAO Annex 3 on meteorological services for international navigation also promises to enhance flight safety and efficiency. Included is the addition of global gridded forecast for cumulonimbus clouds, icing and turbulence. There are also improvements to volcano watch, alerts and better clarity of operational meteorological information.

Looking into the future, aviation safety may face a greater challenge from the likelihood of more extreme weather in the face of climate change. The key is better preparedness. ■

By **Lim Lay Eng**  
Senior Inspector (Meteorology)



### CAAS Approval Holders

Figures are accurate as on 1 January 2014

Aerodrome and Air Navigation Services	
Air Navigation Service Provider	1
Aerodrome Operator	1
Aerodromes	2
Air Operators and Aerospace Organisations	
Air Operator Certificate Holders	8
Design Organisation Approval Holders	18
Production Organisation Approval Holders	17
Approved Maintenance Organisations	156 ▼
Training	
Flying Training Organisations	5
Type Rating Training Organisations	4
Maintenance Training Organisations	9
Training Organisation for Air Traffic Controllers	1

### Singapore Registered Aircraft

Public Transport	191 ▲
General Aviation	23

### New Approvals Granted

From 1 October 2013 to 1 January 2014

Organisations	Approval Granted
Bombardier Aerospace Services Singapore Pte Ltd	SAR-145 Rating A1, MD1, MD2

### Lapsed Approvals

Organisations	Approval that Lapsed
Jetstar Airways Pty Limited (Australia)	SAR-145 approval
GE Aviation System Pacific Service Center Pte Ltd (Singapore)	SAR-145 approval



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# South East Asia Collaborates to Enhance Flight Safety Standards

The 15<sup>th</sup> Cooperative Development of Operational Safety & Continuing Airworthiness Programme – South East Asia (COSCAP-SEA) Steering Committee Meeting (SCM) was held in Bangkok from 25 – 26 November 2013. Attended by 63 delegates from Member States/Administrations, safety partners and donors, the meeting witnessed the leadership handover from Singapore to Thailand, where Mr Voradej Harnprasert, Director-General, Department of Civil Aviation, Thailand, assumed chairmanship of the COSCAP-SEA.

As the outgoing chairman, Mr Yap Ong Heng, Director-General of CAAS recounted the past year's activities in three key areas – capacity building, improving safety frameworks and safety enhancement. Twenty-two missions were organised to assist in developing States' safety frameworks for safety oversight and to address ICAO Universal Oversight Audit Programme findings. These missions also supported States' transition towards ICAO's Continuous Monitoring Approach.

In addition, 18 courses, workshops and seminars, attended by over 370 participants, were conducted to continue building capacity and technical competence in the region. The COSCAP-SEA Regional Aviation Safety Team also aligned its work with the Asia Pacific Regional Aviation Safety Team for a more harmonised approach towards safety enhancement.

The next SCM will be hosted by Timor Leste in Dili at the end of 2014. ■

## About COSCAP-SEA

COSCAP-SEA is a non-profit association of civil aviation administrations (CAAs) in the South East Asian region. Formed in July 2001 under ICAO's Technical Co-operation Programme, COSCAP-SEA primarily focuses on enhancing flight safety in the region through harmonisation of regulations, policies and procedures related to the certification and surveillance of operators, manufacturers and maintenance facilities. Comprising 13 States/CAAs – Brunei, Cambodia, Hong Kong China, Indonesia, Lao PDR, Macao China, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam – COSCAP-SEA is a useful platform for members to seek support in raising safety standards of the region.

By **Mak Chee Seng**

Senior Manager (Continuous Airworthiness)

# Pushing Forward in Aircraft Maintenance Training and Licensing

Trained and competent personnel is necessary for the continued safe growth of the Singapore aviation sector. As such, CAAS regularly engages the industry through platforms to discuss and collaborate on aircraft maintenance training and licensing matters. The *CAAS Safety Series* seminar held on 29 October 2013, was one such platform to highlight the regulatory changes in the SAR-66 (Aircraft Maintenance Licence) and SAR-147 (Approved Maintenance Training Organisation).

Notably, SAR-66 has recently been amended to include expanded privileges for Category B2 aircraft maintenance licences (AMLs). Previously, the privileges did not include certifying tasks for electrical subsystems found in most of the electro-mechanical systems, including the fuel, landing gear, hydraulic power, cabin pressurisation and air-conditioning systems. To optimise deployment of Category B2 AML holders and leverage on their expertise, CAAS expanded their privileges to include the maintenance and certification of electrical subsystems in all the electro-mechanical systems. Approved maintenance organisations can now deploy Category B1 and B2 AML holders more effectively.

Consequently, the training and examinations for Category B2 AMLs were adjusted to cater for the expansion. The basic AML knowledge syllabi and examinations were also amended to include knowledge in new technologies to enhance the understanding of new generation aircraft.

In 2012, CAAS and Temasek Polytechnic collaborated on a framework to approve Institutes of Higher Learning (IHLs) as SAR-147 organisations, thereby allowing IHLs to conduct basic AML courses. Besides value adding to the academic qualifications of IHL students, the industry also benefits from having a larger, more productive pool of manpower. As local IHLs are showing interest in obtaining the SAR-147 approval, CAAS discussed the certification approval process during the seminar.

To improve the quality of training conducted by SAR-147 organisations, the seminar also highlighted common findings from the annual surveillance of



these organisations. Recurrent training for instructors and refreshing of the type-examination question banks were highlighted as areas that required attention. In addition, the seminar clarified some common queries that the industry had about the SAR-147 requirements. One such query is whether a SAR-147 organisation must provide its trainees with access to an operating airworthy aircraft for hands-on skills training. In reality, the most suitable aircraft for the purpose of practical skills training is a non-operating and non-airworthy aircraft in a simulated operating environment.

With a better understanding of the AML regulatory requirements and their rationales, aircraft maintenance and training organisations can carry out their roles and responsibilities with greater effectiveness. ■

By **Oi Tze Liang**

Manager (Personnel Licensing)

and

**Quek Tong Huat**

Senior Manager (Personnel Licensing)



# Rightsizing Your Safety Management System

Today, Safety Management System (SMS) is mandatory for airlines, aircraft maintenance organisations (AMOs), aircraft manufacturers, aerodrome operators, air navigation services providers and aviation training organisations that are exposed to operational safety risks. It may be extended to more sectors in the future. While it is easier to relate to the safety implications of front-line activities such as those faced daily by airlines, aerodromes and air traffic services, the safety implications from upstream activities such as training or aircraft maintenance may be just as significant. Each organisation has to look within itself and manage the direct and indirect safety risks that they may pose downstream.

The SMS concept lets each organisation develop, based on a set of key elements, its own system that is commensurate with its size and the complexity of its aviation products or services. But what does "commensurate with the size and complexity" mean? What is considered "big" or "complex", and what kind of system would be considered "commensurate" and thus, be effective for the organisation?

Typical considerations on "commensurate with size and complexity":

- Number of employees;
- Number and type of approvals/ratings held;
- Number or types of aircraft operated or maintained;
- Extent and scope of contracted activities; and
- The type of environment where operations are conducted.

The organisation should first take a step back to understand and recognise the downstream safety implications of the aviation product or service that it is responsible for.

While the typical considerations and examples cited in SMS literature seem to relate more to an airline or aerodrome environment where hazards and risks can be more directly identified, safety risks are present not only in these environments. The product or service may be upstream of the eventual aircraft operation, but its failure could have downstream

consequences. The recognition of this relationship is essential for the organisation in devising a meaningful SMS that identifies the hazards and mitigates the risks, posed by its manufacturing or service delivery processes, which may lead to the possible failure of the product or service. Simply put, could any of the processes be a contributory, or even the causal factor to an unfortunate event? What measures could then be put in place to mitigate the risks?

### Safety Risk Management in an AMO

Looking at the case of an AMO, what would be the implication of a failure of a product or service within the AMO? Would the worst consequence envisaged be a mere write-off of the product?

The AMO should take into account two key aspects when evaluating the risk posed by its operations: the criticality of the product, and the complexity of the maintenance task.

The Federal Aviation Administration (FAA), in its Advisory Circular AC 43-18, identifies some systems whose components are critical to safe operations, where their failure to function could lead to severe consequences. Close attention should be paid to components of systems such as:

- a) Aircraft flight handling (e.g. flight controls component, primary flight instruments)
- b) Aircraft power control (e.g. rotor, propeller, engine control component, propeller control component, fuel control, ignition control, electronic engine control)
- c) Aircraft landing control (e.g. landing gear, landing gear system, skid, float)
- d) Safety protection/egress handling (e.g. evacuation slide, light, door, seat, belt, oxygen supply, fire/smoke detection, fire bottles, extinguishing components)
- e) Energy content components and its control (e.g. engine, propeller, rotor, pressure vessel, tube and hose, electrical power, fuel, accumulator, pump)

In determining where the safety risks lie, the organisation should also consider the complexity of maintenance activities carried out on the product in addition to the criticality of the component. Each maintenance activity has some likelihood of it being incorrectly performed and the likelihood corresponds directly with the number of activities involved. For example, the overhaul of a hydraulic valve would undergo several maintenance activities such as repair assessment, valve disassembly, part cleaning and inspection, valve reassembly and valve functional test. Processes that are very manual in nature would tend to have a higher error probability. Examples of such processes are the assembly of an engine or complex component and the planning of maintenance tasks. The organisation should also consider the probability of detecting an error early along the chain of maintenance activities. For example, would the use of a wrong material, or the erroneous input of data be detected before the aircraft goes back to service?

Based on the considerations above, the AMO could then carry out a safety risk assessment of its processes; the criticality of the product would provide a sense of the severity of the consequence, while the complexity of the processes could indicate the likelihood of the risks.

The above methodology should also be extended to the products and services received from contractors. Have the risks been addressed at source, or are the risks embedded in these outsourced products and services? These are risks that the AMO, and those downstream, are also exposed to. Contractors should be roped in to establish processes to identify such safety risks, so that these risks do not continue to be embedded and passed down along the value chain.

An AMO may:

- 1) Review and assess the severity of the consequences of failure of its aviation products or services, and identify those of high severity;
- 2) Determine and identify those maintenance activities which have high probability of errors on those aviation products or services assessed in step (1); and
- 3) Devise processes, based on SMS concepts and elements, to control and manage the risk of errors on the number of maintenance activities identified in step (2).

These are but some considerations that an AMO may take into account in designing its SMS. The AMO environment is very dynamic and risks may come from many sources: resource constraints, time limitations, customer demands, etc. These add stress and potential safety risks, which have to be managed accordingly.

### Leveraging on Existing Management Systems

With this understanding, the safety risks posed during the production or delivery processes can be identified, assessed and then mitigated accordingly. Other key elements of the SMS may already be in place within the organisation as part of other management systems, such as quality and documentation systems, and these can be leveraged upon in applying the safety management principles. The safety risk management and safety assurance processes could be integrated with these other existing management systems, which are already effectively running, to achieve an SMS that is appropriately sized to the organisation and the complexity of its aviation products and services.

### Internalising SMS in Your Organisation

The benefits of SMS will be best realised when the SMS culture is internalised throughout an organisation. When this happens, the SMS would intrinsically be "*commensurate with the size and complexity*" of the organisation. As new products are launched, new services are delivered, and as the organisation grows, the SMS would evolve correspondingly and in synchronisation with the new challenges. Safety risk management would then be an integral part of the organisation's operations.

SMS goes beyond compliance, and requires the organisation to develop a system appropriate for its own size and complexity of its aviation products and services. By recognising the safety implications of its products and services, and applying the principles of SMS, the organisation will be able to establish its own relevant yardstick for the performance of its safety management. ■

By **Tan Meng Lee**

Deputy Head (Policy & Rulemaking),

**Wong Chew Wah**

Deputy Head (Continuing Airworthiness – Heli/BAGA)

and

**Chee Yen Ting**

Senior Manager (Planning & Analysis)

#### References:

- AOCR Chapter 5, paragraph 10.3
- SAR-145, paragraph 145.64
- Singapore AC 1-3
- FAA AC 43-18
- UKCAA CAP 1059 Safety Management Systems: Guidance for small, non-complex organisations
- ICAO Document 9859 Safety Management Manual

# Beyond the In-flight Meals and Entertainment

Cabin safety is an integral and vital part of aviation safety, which focuses on the prevention of flight failures in the cabin and the improvement of post-crash survivability through regulation, education and training. Lessons learnt from past accidents and emergencies, together with relentless research and technological advancements, have taught regulators, aircraft manufacturers and operators the importance of putting protective and preventive measures in place to safeguard against these unwanted events and to promote the welfare of aircraft occupants before and after an impact landing on ground or water.

With growing focus on cabin safety improvements, CAAS and the Cooperative Development of Operational Safety & Continuing Airworthiness Programme Southeast Asia (COSCAP-SEA) jointly hosted the second Cabin Safety Seminar in Singapore from 19 – 21 November 2013. Attended by over 200 participants from 23 countries, the seminar provided an avenue for participants to share their experiences and information on the latest developments in cabin safety from both the regulatory and industry perspective. Topics discussed included regulatory issues, threats to cabin safety, cabin crew training and lessons learnt from accidents and incidents.

In-depth investigations of past accidents have helped investigators, operators and aircraft manufacturers identify key factors related to higher survivability rates in the event of a crash. These identified factors have in turn led to developments in technology, better conceived evacuation procedures and improvements in the training and proficiency of cabin crew, both on an individual level and as a team.

Technology and its advancements play a critical role in safeguarding the wellbeing of passengers and cabin crew. These advancements include the use of improved cabin layouts together with efficiently placed emergency exits and escape path lighting. The evolution and/or provision of new equipment such as better aircraft seat structures, fire-fighting tools, heat resistant evacuation devices and fire retardant materials in seat cushions have further contributed to this cause. Besides technological advancements, regulators and aircraft manufacturers are also convinced that developments in safety protocols and procedures, such as enhancements in certification requirements and training, can help improve cabin safety standards.

Cabin crew training cannot be over emphasised as these professionals are charged with safety duties that are designed to mitigate inherent risks in air travel and to protect the travelling public. Their flight duties extend to the prevention and/or handling of a diverse range of in-flight emergencies such as lavatory fires, oven fires, medical related emergencies and incidents of unruly behaviour by passengers. In the event of an emergency upon landing or takeoff, they also play the crucial role of evacuating passengers in a calm



and expeditious manner while ensuring the continued safety and survival of these passengers post-emergency. Two recent examples where cabin crew performed this role are the USAir A320 ditching in the Hudson River in New York in January 2009, and the more recent July 2013 crash landing of Asiana's B777 in San Francisco airport.

Looking into the future, the aviation industry has noted the need for enhancements to the scope of training for the next generation of aviation professionals. This enhanced training is expected to incorporate on-job sessions and experience in real-world operations. With these revisions, aviation professionals will be given the opportunity to sharpen their operational skills, develop mental agility in handling emergencies and work towards fostering mental fortitude to manage the aftermath of an impact emergency.

After completing this training, cabin crew will then be equipped with greater confidence, communication skills and teamwork – attributes that can help allay panic, improve response time and reduce misdirection in an emergency evacuation. Part of these training enhancements, which indicate a greater focus on competency-based training rather than just learning by rote, is highlighted in the latest revision of the ICAO Cabin Crew Safety Training Manual (DOC 7192 Part E-1) and the forthcoming material on initial and recurrent cabin crew training.

Other than the cabin crew, the travelling public also has a part to play in the management of accidents and post-crash survivability. Yet it was noted that this portion of cabin safety is not as strong as it can be. More safety promotion activities are required to heighten the awareness of simple safety instructions, such as the fastening of passenger seat belts and the removal of their infants from the bassinet whenever the seat belt signs are illuminated. While the public may think of these instructions as inessential, and more of an annoyance, they are in fact critical pieces of



information that can safeguard the wellbeing of passengers, for example, during episodes of turbulence.

Beyond the individual cabin crew and passenger, airlines, under the auspices of their safety management systems, should also take definitive responsibility in the risk management of their operations. There was however, acknowledgement between regulators and the industry that it remains an ongoing challenge to strike a balance between adhering to safety regulations and meeting service standards. Despite the difficulties, the industry and regulators alike recognised the need for steps to be taken to ensure that service enhancements come with an equivalent upgrade in the level of safety.

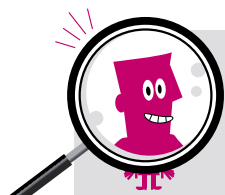
Lastly, in this age of globalisation, where passengers are travelling to destinations around the globe through the use of various air alliances and code-share partnerships amongst airlines, there is a need for greater harmonisation of regulations amongst nations so as to reduce confusion and possible uncooperativeness among passengers. Some areas that are in need of harmonisation include the usage of personal entertainment devices in an airplane and the requirements related to the employment of child restraint devices. When harmonisation of these issues is achieved, the industry will be able to better realise seamless air travel together with the assurance of cabin safety. ■

By **Cherie Ann Khalil**  
Senior Aviation Safety Inspector,

**Hew Sek Moy**  
Senior Aviation Safety Inspector

and

**Karen Chang**  
Aviation Safety Inspector



## New Appointments

### Mr Michael Pang

was appointed as Head (Standardisation and Planning) with effect from 1 October 2013. The Standardisation and Planning (S&P) Section is a new unit within the Airworthiness/Flight Operations (A/FO) Division that is responsible for standardisation of processes and procedures, management and resource planning, and internal quality assurance. It spearheads improvement efforts within the A/FO Division.



### Mr George Foo

was appointed as Head (Foreign Operators Surveillance) with effect from 1 October 2013. The Foreign Operators Surveillance (FOS) Section is a new unit within the A/FO Division that is responsible for the safety surveillance of foreign air operators operating in and out of Singapore.



## Singapore Aviation Academy Training Programmes

PROGRAMME TITLES	DATES
Singapore Airworthiness Requirements (SAR) Part 145	31 Mar – 3 Apr 2014
Incident Investigation: Effective Safety Risks Management	31 Mar – 4 Apr 2014
Integrated Safety Management Systems	28 Apr – 9 May 2014
EASA Part 21 Subpart J - Design Organisation Approvals (jointly organised with UK Civil Aviation Authority International)	5 – 6 May 2014
Aviation Quality Management Systems	5 – 9 May 2014
EASA Part 21 Subpart G - Production Organisation Approvals (jointly organised with UK Civil Aviation Authority International)	7– 8 May 2014
Safety Oversight Managers	19 May – 5 Jun 2014
Non-destructive Testing Auditing (jointly organised with UK Civil Aviation Authority International)	20 – 22 May 2014
Cabin Safety Inspectors (jointly organised with UK Civil Aviation Authority International)	3 – 5 Jun 2014
Managing Weather Impacts: Enhancing Aviation Safety and Flight Performance	23 – 27 Jun 2014
Safety Oversight of Aviation Meteorology Services <b>NEW</b>	30 Jun – 02 Jul 2014
Aviation Medicine for Medical Examiner and Assessors (Competency-based)	30 Jun – 11 Jul 2014
Safety Oversight Airworthiness Inspectors	4 – 15 Aug 2014
Safety Oversight Flight Operations Inspectors	4 – 15 Aug 2014

Course dates are subject to change. For the full range of courses offered by the Academy, please visit [www.saa.com.sg](http://www.saa.com.sg). ■

# A New Just Culture Algorithm

Creating a just culture in your organisation can be hard — even before you worry about the influence of the judiciary. Here are some steps to consider.

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

In the 1940's, human factors engineers and psychologists started asking what is responsible for errors, not who are responsible. Human factors showed that people's actions and assessments make sense once we understand critical features of the world in which they work. People's actions are systematically connected to the features of their tools and tasks. Targeting those features (the what) unlocks the potential for learning, change and improvement.

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

One of the frustrating experiences by practitioners involved in an incident, is that those who judge them often do not have the same intimate knowledge of the work. Whether this is a supervisor, an inspector, the police, a judge or a jury, they do not know the messy details, technical knowledge, and misunderstand the subtleties of what it takes to get the job done despite the organisation, rules and multiple constraints. They may also have incentives to build a narrative that puts the practitioner at a disadvantage. So people involved in the aftermath of an incident must know the messy details, and have credibility in the eyes of other practitioners.

## 3. Explore the potential for restorative justice

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

Restorative justice, however, suggests that if the error or violation (potentially) hurt, then the response should heal. Restorative justice acknowledges the existence of multiple stories and points of view about how things could have gone wrong (and how they normally go right). It fosters dialogue between the actor and the surrounding community (e.g. colleagues), rather than a break in relationships through sanction and punishment.

## 4. Go from backward to forward-looking accountability

Backward-looking accountability means blaming people for past events, which implies some sort of sanction, removal or dismissal. It is not clear what people hope to achieve with this sort of retrospective accountability, other than perhaps instilling a sense of anxiety and focus in others. But experience shows that it only motivates others to be more careful with reporting and disclosure.

If, instead, we see somebody's act as a representation of an organisational, operational, technical, educational or political issue, then accountability can become forward-looking. This focuses on addressing the problem and determining who should be accountable for implementing those changes and assessing their effectiveness. Consistent with a new type of thinking in which people are regarded as a solution to harness, forward-looking accountability can help people focus on the work necessary for change and improvement, and connects organisational and community expectations to such work.

## 5. Put second victim support in place

Second victims are practitioners who have been involved in an incident that (potentially) hurt or killed someone else (e.g. passengers, bystanders), for which they feel personally responsible. Strong social and organisational support systems for second victims (psychological first aid, debriefings, follow-up) have proven critical to contain the negative consequences, particularly post-traumatic stress. Implementing and maintaining support systems takes resources, but it is an investment in worker health, retention, justice and safety.

Justice can come from acknowledging that the practitioner is a second victim, who may find it healing to recount experiences — if these are taken seriously and do not expose him to potential retribution or other forms of jeopardy. Such involvement of second victims is an important organisational investment in safety and learning. Their lived experiences represent a rich trove of data on how safety is made and broken. Those accounts can be integrated into how an individual and organisation handle their risk and safety.

Just culture is a never-ending process, even if your organisation implements the algorithm above. Justice is after all, subjective. But by following the steps above, you can help create a climate of honesty, care, fairness and a willingness to learn, and justice may just come around by itself. ■

*This article was first featured in HindSight, EUROCONTROL's ATM safety magazine.*

By **Sidney Dekker**

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