



From Occurrence to Outcome: The Case for Robust Safety Reporting in Aviation

Capt. Rizan Noordin, Deputy Director (Air Operations),
Flight Standards Division, CAAS

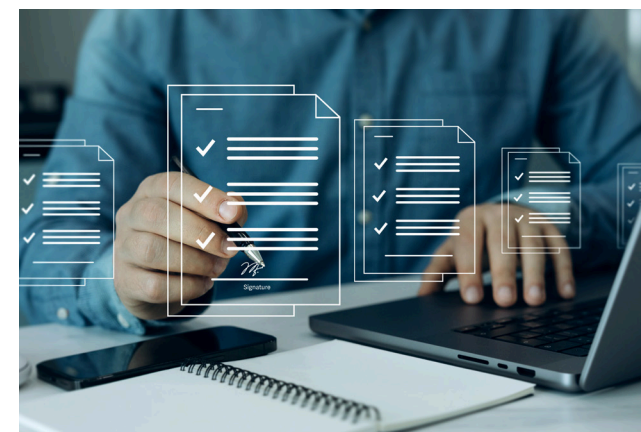
June 2026

Aviation has an unusual relationship with failure. Unlike many industries where mistakes are quietly buried in internal reviews, aviation's hard-won tradition is to surface them — to document, analyse, publish, and most importantly, draw learnings from them, in an open and transparent manner. This discipline, uncomfortable as it can be, is precisely why flying commercially remains statistically the safest way to travel. It is also why safety reporting is not just a box-ticking exercise; it is at the heart of a functioning Safety Management System (SMS).

In Singapore, this philosophy is embedded in our regulations. The Air Navigation (91 - General Operating Rules) Regulations 2018 sets out a comprehensive list of occurrences that trigger mandatory reporting obligations — from runway incursions and airspace deviations to aircraft system failures and dangerous goods incidents. These categories are not arbitrary. Each represents lessons learned from past occurrences somewhere in the world, often at a high cost.

Complementing mandatory reporting is *Tell Sarah*, Singapore's confidential voluntary reporting system for aviation safety. It allows individuals to flag potential hazards or unsafe practices that could compromise aviation safety, enabling insights and trends from these reports to be studied and acted upon before harm occurs. The combination of mandatory and voluntary channels is deliberate; between them, they are designed to capture the full spectrum of safety signals.

A fundamental truth understood by every experienced operator is this: for every accident, many near-misses precede it. The accident is the visible tip; the unreported incidents are the submerged iceberg. A comprehensive reporting framework — both mandatory and voluntary — seeks to make that iceberg visible early enough to allow intervention before a ship strikes it. The consequences of failing to act on this visibility can be severe, as illustrated by a recent accident.



Reporting Must Drive Action, Not Just Records

A recurring pattern in aviation safety data illustrates what happens when reporting loops remain unclosed. In documented occurrences involving repeated near-miss interactions between fixed-wing aircraft and helicopters in complex terminal environments, data from reported occurrences, flight crew observations, and ATC reports had already highlighted patterns of reduced separation and airspace deconfliction challenges in mixed-traffic operations.

Although each event was individually recorded and analysed, the underlying system risk — spanning airspace design, traffic procedures, and coordination practices — persisted. The gap was not in the volume of reports, but in the speed at which aggregated safety information was translated into structural risk mitigation.

The lesson is clear: safety reporting only delivers value when information flows to decision-makers, is synthesised into a systemic risk understanding, and drives timely intervention. It is the closure of the loop — from identification to action — that removes hazards from the operational environment.

This is precisely the role that the Singapore Aviation Accident/Incident Reporting System (SAIRS)¹ is designed to fulfil. As the mandatory reporting channel, SAIRS collects accident and incident data, which are then analysed to identify safety trends and inform the development and implementation of targeted mitigation measures. In this way, SAIRS links individual reporting obligations to system-wide safety improvements. This reflects the full cycle: collect, analyse, act, and close the loop. Reporting is only the first step — safety improvement is the outcome. Too many organisations mistake step one for the finish line.

Aviation Safety in the Asia-Pacific: Work in Progress

The Asia-Pacific (APAC) region carries weight in this discussion, both because of its extraordinary growth as an aviation market and because of the challenges surrounding safety data completeness. The number of fatalities in the Regional Aviation Safety Group (RASG)-APAC region increased to 186 in 2024, up from 72 in 2023 — serving as a stark reminder of the need to continue ensuring the safety of air travel amidst sustained growth and complexity². Encouragingly, the RASG-APAC accident rate has remained lower than the global accident rate over the past decade³ — a genuine achievement in a region with considerable variation in regulatory maturity across its member states.

¹ [CAAS](<https://www.caas.gov.sg/resources/safety-reporting/singapore-aviation-accident-incident-reporting-system/>)

² [ICAO](<https://www.icao.int/sites/default/files/APAC/RASG/RASG-eDocs/APAC-Annual-Safety-Report-2025.pdf>)

³ [ICAO](<https://www.icao.int/sites/default/files/APAC/RASG/RASG-eDocs/APAC-Annual-Safety-Report-2025.pdf>)



However, the region faces transparency challenges that affect the collective learning that safety reporting is meant to enable. IATA's analysis of accident investigations from 2018 to 2023 reveals that only 57% of investigations globally were completed and published as required under the Chicago Convention. The Asia-Pacific region's completion rate stands at 53%, compared to 75% for North Asia and 70% for North America⁴. When investigation reports are not completed or published, the global aviation community is deprived of vital safety lessons. IATA has thus called for a coordinated global effort to provide technical support where investigative capacity is the constraint⁵. Shared learning is a collective obligation, and with the region aspiring to lead on safety performance, closing this reporting gap is an essential priority.

Global Safety Trends: A Renewed Call for Vigilance

According to ICAO's 2025 Safety Report, there were 95 accidents involving scheduled commercial flights in 2024, compared to 66 in 2023, with 10 fatal accidents resulting in 296 fatalities. The global accident rate rose to 2.56 accidents per million departures⁶, against a backdrop of 37 million departures worldwide⁷.

Alongside these figures, ICAO identified a set of recurring high-risk categories - including controlled flight into terrain, loss of control in flight, mid-air collision, and runway incursion⁸ -

that continue to account for a disproportionate share of fatal outcomes. Critically, none of these represent new or unknown risks. Each category has well-established precursor patterns that are frequently observable through incident and occurrence reports well before an accident occurs.

What these trends collectively suggest is that the industry's challenge is not the lack of safety knowledge, but a gap in the consistent application of what is already known. The persistence of these recurring risk categories points to the critical importance of capturing, sharing, and acting on early warning signals before they escalate into serious outcomes. Effective safety reporting is therefore not primarily a tool for hindsight analysis after an accident — it is a proactive mechanism for recognising precursors early enough to interrupt the pathway to those outcomes before they materialise. When reporting systems function as intended, the data they generate can mean the difference between identifying a risk trend and discovering it only after an accident.

Just Culture: Building the Organisational Conditions for Effective Reporting

None of this architecture works in an environment of fear and blame. As ICAO noted at its 39th Assembly, a healthy just culture plays a vital role in a successful safety culture by encouraging employees to report safety incidents and hazardous conditions, enabling the proactive identification of safety-related problems and the identification of safety trends⁹. The regulator's role in this ecosystem is to be a trusted recipient of information, rather than an enforcement authority that treats honest reporting as an opportunity for punitive action.

The [CAAS Handbook on Aviation Safety Culture](#) reinforces this balance, noting that the same just culture framework must remain consistently intolerant of wilful misconduct or reckless behaviour. This is the essential balance: protect the honest reporter, hold accountable those who knowingly cut corners. An organisation that conflates the two — whether by penalising

honest errors or failing to address deliberate violations — will find its reporting pipeline diminish rapidly.

A Record Worth Protecting

The long-term trajectory of aviation safety is genuinely encouraging. IATA data shows the global accident rate has fallen from 3.72 accidents per million sectors in 2005 to 1.13 in 2024 — a decline achieved while the industry more than doubled its volume. That progress was not delivered by wishful thinking. It was delivered by a global culture of documenting what went wrong, sharing it honestly, and fixing it systematically.

At the same time, safety cannot be taken for granted. Mandatory reporting requirements set the regulatory baseline, but real safety value comes from organisations that treat this baseline as a launch pad. They feed their SMS with rich data from mandatory and voluntary channels, analyse it rigorously, and close corrective action loops as a matter of organisational discipline rather than regulatory compulsion.

Aircraft are highly reliable machines. The humans and systems around them are less so — which is why the aviation industry built one of the world's most sophisticated incident reporting frameworks. When effectively used, it delivers what matters most: flights that land safely and as intended, every time.

OSAKA, JAPAN
AP-SAS 2026
ASIA PACIFIC SUMMIT FOR AVIATION SAFETY
ACHIEVING SAFETY EXCELLENCE, COLLABORATE, REINFORCE, TRANSFORM
REGISTRATION NOW OPEN

CAAS, Flight Safety Foundation and Japan Civil Aviation Bureau are jointly organising the fourth Asia Pacific Summit for Aviation Safety (AP-SAS) in Osaka, Japan from 4-6 August. Join us as we bring together over 400 aviation leaders and experts to address emerging aviation safety priorities and strengthen collaboration in the Asia Pacific region.

Themed "Achieving Safety Excellence: Collaborate, Reinforce, Transform", some key highlights of this annual summit include:

- Keynote address by Mr Onuma Toshiyuki, President of the International Civil Aviation Organization Council;
- Expert discussions on operational resilience, safety culture, and human capital development;
- Insights on leveraging artificial intelligence and emerging technologies to enhance aviation safety.

Registration is now open. For programme details and to secure your spot: flightsafety.swoogo.com/ap-sas-2026.

Subscribe

Sign up [here](#) to receive notifications whenever a new edition is published.

Feedback

We value your input. Kindly provide your feedback to The Leading Edge [here](#).

⁴ [Airlines Ratings](https://www.airlinerratings.com/articles/airline-safety-report-for-2024-1)
⁵ [IATA](https://www.iata.org/en/pressroom/2025-releases/2025-02-26-01/)
⁶ [ICAO](https://www.icao.int/news/latest-icao-aviation-safety-data-reveals-need-renewed-focus-despite-continuous-long-term)
⁷ [Mexico Business News](https://mexicobusiness.news/aerospace/news/icao-reports-95-flight-accidents-2024-urges-global-safety)
⁸ [ICAO](https://www.icao.int/news/latest-icao-aviation-safety-data-reveals-need-renewed-focus-despite-continuous-long-term)
⁹ [CAAS](https://file.go.gov.sg/tle01-2024.pdf)

Editor
Ong Chun Yang

Assistant Editors
Michelle Teo
Nadine Kang

Contact
CAAS_Safety_Promotion@caas.gov.sg
www.caas.gov.sg

The Leading Edge is a publication of the Civil Aviation Authority of Singapore (CAAS). The articles in this publication do not constitute advice and are for general information only. The views expressed by the contributors are not necessarily those of CAAS, and should not be attributed to CAAS.

CAAS as well as each contributor shall not be liable at any time for damages or otherwise, including, without limitation, damages for loss of any kind, arising in contract, tort or otherwise from the use or reading of any part or whole of the publication, or from any action taken or refrained from being taken as a result of using or reading any part or the whole of

this publication. Any reference to any person/entity in any article should not be taken as an endorsement, recommendation or preference by CAAS. The copyright in this publication is owned by CAAS, unless otherwise specified. Reproducing copies of this publication within your company or organisation or for your own personal use is permitted but reproduction for publication otherwise is prohibited.

All rights are reserved. If you wish to use or reference this publication for any other purpose e.g. as training material for students, please contact us for CAAS' formal agreement.

Sharpen Your Safety & Security Expertise

Upcoming Courses

by the SAA's School of Aviation Safety and Security

New Programmes			
SMS Evaluation – The Enhanced PSOE Approach		Safety Leadership Programme	
<i>Develop effective Safety Management System (SMS) assessments</i> Ideal for: Safety managers and inspectors involved in the conduct of self-assessments of SMS You will be able to: • Conduct a SMS assessment using a practical tool comprising outcome-based assessment expectations • Strengthen your safety oversight capabilities through comprehensive training in the Present, Suitable, Operating, Effective (PSOE) methodology for SMS evaluation.		<i>Strengthen your leadership skills to build safety management excellence</i> Ideal for: Senior management with safety roles and functions in aviation organisations You will be able to: • Master safety roles and responsibilities • Enhance leadership qualities essential for cultivating a positive safety culture • Sharpen your ability to communicate with stakeholders who may have competing priorities	
July		September	
6-10 Jul 2026	ICAO Aviation Security Training Package: Aviation Security Managers	28 Sep - 1 Oct 2026	Aviation Security Management Programme
14-17 Jul 2026	Safety Auditor	21-25 Sep 2026	ICAO Training Package: Obstacle Limitation Surfaces (OLS) <i>[New]</i>
20-23 Jul 2026	Lead Safety Auditor	21-23 Sep 2026	SMS Evaluation – The Enhanced PSOE Approach <i>[New]</i>
27-31 Jul 2026	Resolution of Safety Issues		
August		October	
3-7 Aug 2026	Safety Management System Implementation	13 - 15 Oct 2026	Safety Leadership Programme <i>[New]</i>
11-14 Aug 2026	ICAO Training Package: Safety Management System Assessment and Monitoring	19 - 23 Oct 2026	Safety Case Development and Evaluation
24-28 Aug 2026	ICAO Training Package: Personnel Licensing (PEL) System	26 - 30 Oct 2026	Aviation Incident Investigation Analysis and Report Writing
	ICAO Annex 14 Requirements and Application		
24-28 Aug 2026	Safety Oversight Inspectors (Aerodrome)		
24 Aug-3 Sep 2026	Safety Oversight Inspectors (Airworthiness)		

Join aviation professionals who are building their capabilities to thrive in a rapidly changing industry.
Find out more about the full suite of SAA programmes at saa.caas.gov.sg



Singapore Aviation Academy (SAA) is the training arm of the Civil Aviation Authority of Singapore. The Academy offers a comprehensive range of internationally-recognised training programmes in various aviation-related disciplines. As an established International Civil Aviation Organisation (ICAO) Regional Training Centre of Excellence, SAA's programmes are aligned to ICAO's standards and best practices, to meet the training needs of the international aviation community.

Why Choose Our Courses?

- Competency-Based Learning**
Practical skills you can apply immediately in your role
- Expert Instruction**
Learn from experienced aviation professionals and regulatory specialists
- Global Network**
Connect with aviation professionals across borders and build lasting relationships