

2025



Thailand Annual Safety Report

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Foreword

On behalf of the Civil Aviation Authority of Thailand (CAAT), I am pleased to present the Thailand Annual Safety Report for 2025.

The past year has seen continued growth in aviation activity, accompanied by increased operational demands and system complexity. As flight volumes expand and organisational interfaces become more interconnected, maintaining safety requires more than compliance with regulatory requirements alone. It requires a coordinated, system-wide approach that brings together effective oversight, reliable safety intelligence, and sustained cooperation across the aviation community.

This report provides a consolidated overview of Thailand's aviation safety performance, drawing on safety occurrence data, accident and serious incident investigations, and the results of ongoing oversight activities. It reflects not only where safety risks are present, but also how safety information is being utilised to support learning, guide preventive action, and enhance the resilience of the aviation system as a whole.

Throughout 2025, CAAT continued the progressive transition of Thailand Civil Aviation Regulations (TCARs) to ensure alignment with ICAO Standards and Recommended Practices, as well as evolving operational needs.

This transition represents an important step in supporting a more structured and risk-based approach to oversight, while providing greater clarity and consistency for the industry.

Our efforts to strengthen safety oversight functions, aligned with the ICAO Critical Elements (CEs) remain a top priority. The outcomes of recent assessments under the FAA International Aviation Safety Assessment (IASA) programme and the ICAO Universal Safety Oversight Audit Programme (USOAP) reflect this commitment. These achievements are the result of close cooperation between the Authority and the industry, highlighting the importance of shared responsibility in sustaining international safety standards.

As the global safety framework continues to evolve, attention has been directed towards the implementation of ICAO Annex 19 - Safety Management (Second Edition), including the recently adopted Amendment 3. This development marks a further shift towards a performance-based approach, with increased emphasis on the effectiveness and maturity of Safety Management Systems (SMS) and State Safety Programmes (SSP). In response, CAAT has begun preparing for the gradual expansion of oversight scopes in these areas, ensuring that regulatory readiness and industry capability progress in a balanced and coordinated manner.

Overall, 2025 can be regarded as a constructive period for Thailand's aviation safety system. Meaningful progress has been made in reinforcing a positive reporting culture and enhancing the use of safety data to support risk management. These efforts provide a solid foundation as Thailand prepares for the next phase of safety management and the continued evolution of the global safety framework.

I would like to express my sincere appreciation to the organisations and individuals who contributed information, expertise, and cooperation throughout the year. Your continued support remains essential to the advancement of a safe, efficient, and internationally trusted aviation system in Thailand.



Mr. Kajonpat Maklin

Deputy Director General - Safety
Acting Manager of Aviation Safety Management and
Standards Assurance Office (SMO)





Executive Summary

This report presents an analysis of aviation safety occurrences reported to the Civil Aviation Authority of Thailand (CAAT), together with information from accident and serious incident investigations and oversight activities conducted during 2025.

While occurrence data continues to reflect high reporting volumes across several categories, the analysis indicates that frequency alone does not necessarily correspond to safety risk significance. Certain frequently reported events, such as wildlife-related occurrences, continue to be predominantly assessed as low-risk in terms of potential accident outcomes.

In contrast, the data highlights several higher-consequence risk areas that require continued attention. Controlled Flight into Terrain (CFIT) remains one of the most critical safety risks based on severity and accident potential. In parallel, the increasing trend of System and Component Failures, particularly non-powerplant systems, indicates a shift towards highlighting technical reliability challenges. These trends suggest the need for continued focus on engineering reliability, maintenance practices, and early detection of subsystem degradation.

The report also identifies the growing impact of external and system-wide risks, particularly those related to Global Navigation Satellite System (GNSS) interference and other forms of interference with aircraft operations. Although many of these occurrences are initially assessed as low to medium risk, as they occur across different areas and can affect multiple systems, including navigation, surveillance, and flight crew decision-making, highlight their significance as emerging systemic risks requiring coordinated mitigation across stakeholders.

Safety performance differs across sectors, with some areas remaining stable while others show emerging concerns. Commercial air transport operations continue to demonstrate stable overall performance, although technical reliability trends warrant close monitoring. Helicopter operations maintain a predominantly low-risk profile, supported by effective monitoring systems, while still requiring attention to critical system components.

In contrast, General Aviation shows signs of an increasing risk profile, particularly in relation to navigation interference and security-related occurrences. Air Navigation Services data further reinforces the importance of addressing external hazards and strengthening coordination between aviation and non-aviation stakeholders.

The level of occurrence reporting in 2025 remains consistently high and comparable to previous years, reflecting continued progress in promoting a positive reporting culture and the application of Just Culture principles. This sustained reporting performance supports more effective hazard identification and risk analysis, enabling CAAT and the aviation community to better understand safety trends and prioritize mitigation actions.

This Annual Safety Report is intended to support civil aviation organisations and stakeholders in identifying priority safety risks, strengthening their safety management practices, and contributing to the continuous improvement of aviation safety in Thailand.

The analysis is structured across the following aviation sectors:

-  **COMMERCIAL AIR TRANSPORT**
 - AEROPLANE OPERATIONS | HELICOPTER OPERATIONS
-  **GENERAL AVIATION**
-  **APPROVED TRAINING ORGANISATIONS**
-  **AIR NAVIGATION SERVICE PROVIDERS**
-  **AERODROME OPERATION**
-  **STATE AIRCRAFT**

INTRODUCTION:



This section presents Thailand's State safety performance outcomes for 2025 against the Acceptable Levels of Safety Performance (ALoSPs) and State safety objectives defined in the Thailand Aviation Safety Action Plan (TASAP) 2024 - 2026 (Revision 1).

It provides a high-level overview of the effectiveness of Thailand's State Safety Programme (SSP) implementation and demonstrates the State's progress in achieving its safety objectives through systematic monitoring and performance and risk-based oversight.

Safety performance is measured and monitored through State Safety Performance Indicators (SPIs) within the State Safety Performance Framework. For each SPI, corresponding State Safety Performance Targets (SPTs) are established to serve as milestones for tracking progress and supporting achievement of safety objectives throughout the three-year planning cycle.

The results presented support evidence-based decision-making, proactive safety risk management, and transparent communication of safety performance to stakeholders.

SCOPE:



This part covers safety performance outcomes across Thailand's civil aviation system, including all relevant aviation stakeholders such as CAAT, AAIC and Civil Aviation Organisation.

The analysis is based on data derived for the State occurrence database, safety oversight activities, and safety performance monitoring conducted under the State Safety Programme.



RESULTS OF MEASUREMENT AGAINST ALOSP INDICATORS

The overall measurement results indicate that Thailand's aviation safety performance remains within the acceptable limits established under the State Safety Programme (SSP) framework. A consolidated overview of all ALoSP indicators are presented below.

STATUS:

Thailand has established its ALoSP as a key mechanism for determining whether national aviation safety performance remains within acceptable limits under the SSP framework defined in TASAP 2024-2026 (Revision 1).

For the current planning cycle, Thailand's ALoSP encompasses both operational safety outcomes and safety oversight effectiveness, including indicators related to:

- 1 Prevention of fatal accidents in commercial air transport
- 2 Reduction of serious safety occurrences
- 3 Risk management in non-commercial operations
- 4 Strengthening safety oversight capability and compliance with international standards

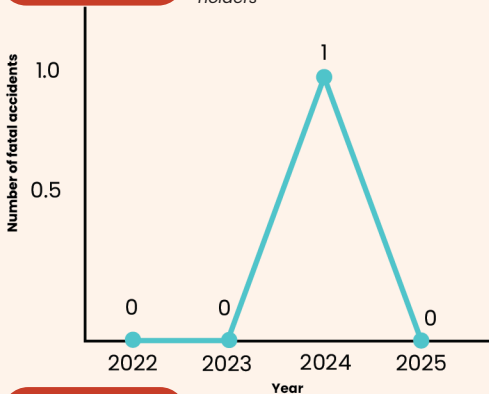
CAAT continuously monitors ALoSP indicators, and results are regularly analysed and reported to support evidence-based decision-making by CAAT management and the National Civil Aviation Safety Board (NCASB).

STATE SAFETY PERFORMANCE



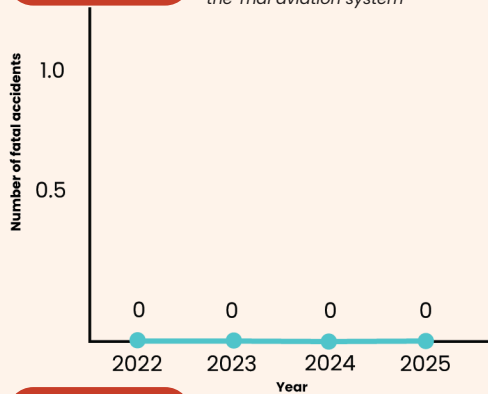
ALOSP 1:

Zero fatal accidents occurred during commercial operations by Thai AOC holders



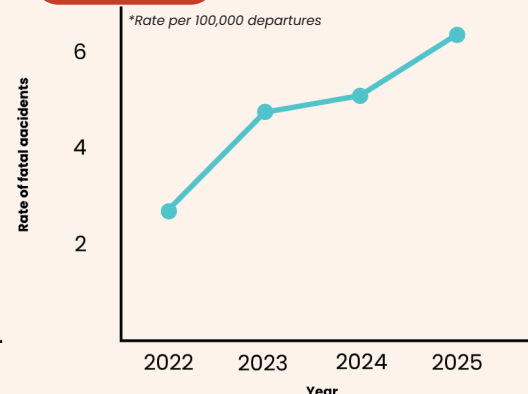
ALOSP 2:

Zero fatal accidents of foreign commercial air transport caused by the Thai aviation system



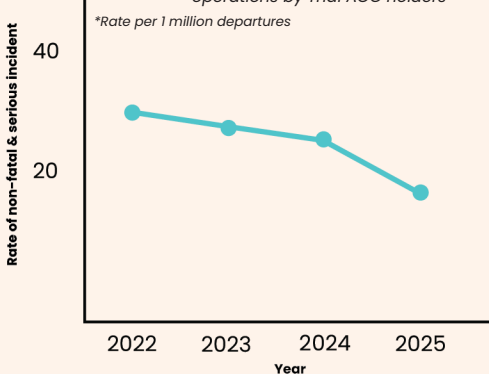
ALOSP 3:

A decreasing trend of fatal accidents during non-commercial operations



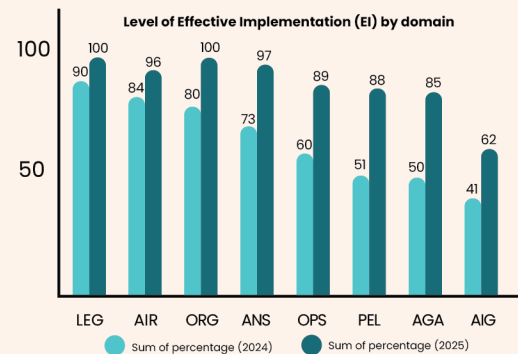
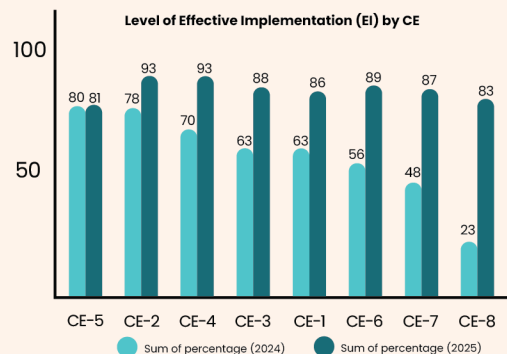
ALOSP 4:

A decreasing trend of non-fatal accident & serious incident during commercial operations by Thai AOC holders



ALOSP 5:

A level of Effective Implementation (EI) of ICAO's SARPs above 85% in each ICAO domain and above 85% for CE-6, CE-7 and CE-8



OVERALL EI SCORE: 87.73

Meanwhile, the five-year rolling average of non-fatal accidents and serious incidents involving Thai AOC holders continues to decline, reflecting improvements in safety management practices and operational risk controls.

Thailand demonstrated significant improvement in safety oversight capability following the USOAP CMA audit conducted in September 2025. The State's overall Effective Implementation (EI) score increased from 61.60% to 87.73%, indicating substantial advancement toward achieving the ALoSP target for oversight capability.

Notable progress was observed in previously weaker areas, particularly surveillance obligations and the resolution of safety concerns.

Continued efforts are required to sustain these achievements, ensure consistent implementation across all oversight functions, and further strengthen risk-based and performance-based oversight to maintain the State's ALoSP.

Overall, the ALoSP results indicate strong safety performance in commercial aviation, while highlighting the need for continued attention to non-commercial risks and long-term oversight effectiveness.

SAFETY PERFORMANCE INDICATORS & TARGETS (SPI/SPT) PERFORMANCE ANALYSIS

State safety performance is further assessed through the monitoring of State Safety Performance Indicators (SPIs) and associated Safety Performance Targets (SPTs) established under the Thailand Aviation Safety Action Plan (TASAP) 2024–2026 (Revision 01). These indicators are structured to support the achievement of Thailand's State safety objectives, which are grouped into two primary categories:

Generic Organisational (GEN) Safety Objectives

Specific Operational (OPR) Safety Objectives



Performance Against GEN Safety Objectives:

Performance monitoring against the Generic Organisational (GEN) safety objectives indicates mixed progress toward strengthening Thailand's State safety oversight system, SSP implementation effectiveness, and Thailand safety culture. A consolidated overview of performance measurement results is presented below.

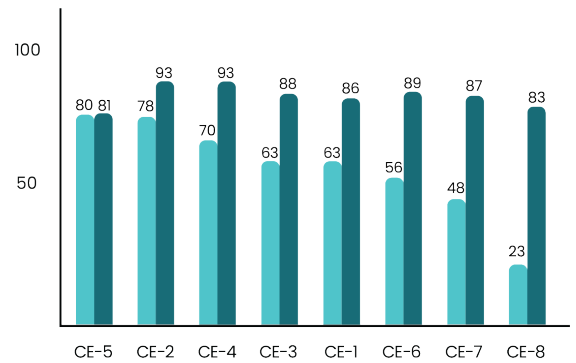
GEN-1

To have an effective safety oversight capability in Thailand

Thailand has demonstrated significant improvement in safety oversight effectiveness following the ICAO USOAP CMA audit conducted in September 2025. The State's overall Effective Implementation (EI) score increased from 61.60% to 87.73%, exceeding the State Safety Performance Target of 85 percent and indicating strong progress toward achieving the desired level of oversight capability.

At the Critical Element level, marked improvements were achieved across all elements, particularly in previously weaker areas such as Surveillance Obligations (CE-7) and Resolution of Safety Concerns (CE-8), indicating enhanced risk-based oversight processes and more effective enforcement mechanisms.

Overall, Thailand now maintains a robust and effective safety oversight system aligned with State Safety objectives. Continued focus is required to sustain performance, ensure consistency across all oversight domains, and further strengthen risk-based and performance-based oversight practices.

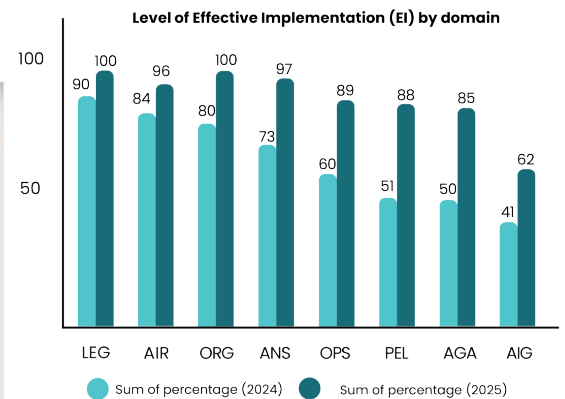


GEN-2

To effectively implement State safety programmes (SSPs)

The assessment results of "SSP implementation maturity" are based on the evaluation conducted in 2024. The results indicate that 34 percent of SSP elements are assessed as "Present," 19 percent as "Present and Effective," and 47 percent remain "Not Present".

Accordingly, the assessment of "SSP implementation maturity" will continue in 2026, utilizing the ICAO SSP Protocol Questions (new edition) as the basis for evaluation.



GEN-3

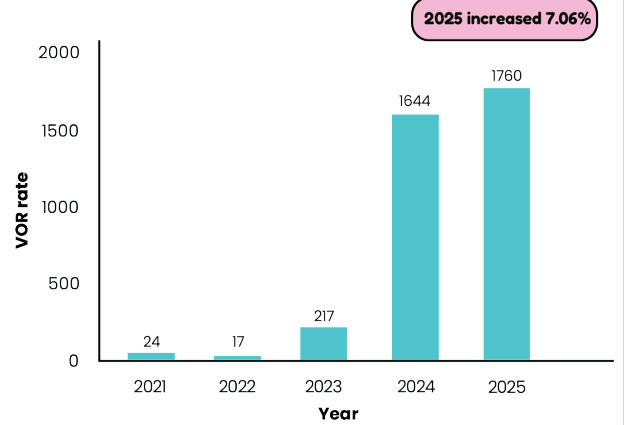
To have an effective safety reporting system & promote Just Culture within the aviation industry

Performance results indicate that voluntary occurrence reporting rates increased by 7.06 percent in 2025, exceeding the annual target of a 5 percent increase. This result confirms that the State has successfully achieved its performance target for this safety objective.

The increase reflects improved reporting activity within the aviation system during the reporting period and continued utilisation of the State's voluntary safety reporting mechanisms.

CAAT is enhancing reporting mechanisms and promoting initiatives to encourage voluntary reporting with the aim of strengthening transparency, trust, and the overall effectiveness of the State's safety reporting system.

Annual VOR rate increase above 5%

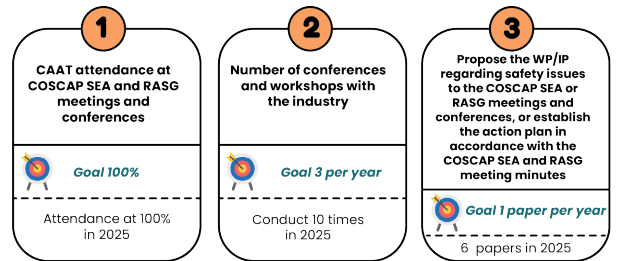


GEN-4

To actively collaborate with all aviation stakeholders to enhance safety in Thailand

Within this reporting cycle, Thailand has been actively involved at the regional level through participation in regional safety meetings, including COSCAP-SEA and RASG-APAC, and by submitting six ICAO working papers to both regional and international safety forums.

In addition, the Civil Aviation Authority of Thailand (CAAT) has conducted ten safety seminars and workshops for the aviation industry, reflecting its proactive engagement with aviation stakeholders.



GEN-5

To ensure that aviation organisations implemented an operating SMS across all aviation system

Assessment results are under development due to the transition to a performance-based SMS assessment methodology. Progress has been made to implement the new approach and strengthen oversight practices; however, not all aviation organisations have been assessed within this reporting cycle. Current results are therefore incomplete and reflect a transitional phase rather than a decline in SMS implementation.

In progress



Overall, performance against the GEN safety objectives indicates steady progress in strengthening Thailand's regulatory framework, safety governance, and stakeholder collaboration.

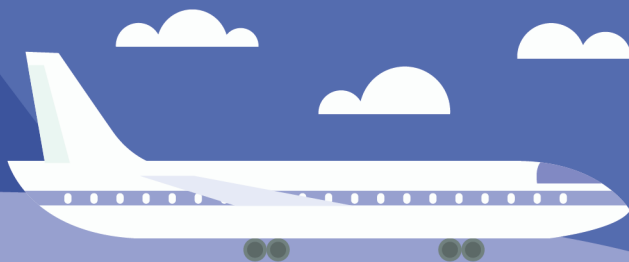


Performance Against OPR Safety Objectives:

Performance monitoring against the Specific Operational (OPR) Safety Objectives provides an overview of Thailand's progress in managing key operational safety risks across the aviation system.

The OPR safety objectives are designed to address the five global High-Risk Categories (HRCs) of accidents identified by ICAO, together with one additional high-priority safety issue specific to Thailand's operational context. These objectives therefore reflect both international safety priorities and national risk-based safety management considerations.

Detailed performance results are presented under each individual OPR objective.



OPR-1

To reduce the rate of occurrences related to Controlled Flight into Terrain (CFIT)

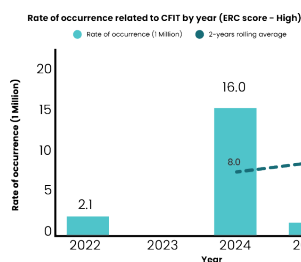
Performance results show that the two-year rolling average indicates an overall increasing pattern in CFIT-related risk indicators, suggesting that the underlying risk level remains elevated over the medium term.

However, year-to-year results show improvement between 2024 and 2025, with several indicators recording a decline during the most recent reporting period. Significant CFIT risk occurrences decreased after a temporary rise in the previous year, and unstable approaches at low altitude also showed a reduction.

These results indicate that recent mitigation measures are having a positive short-term effect; nevertheless, the upward rolling-average trend confirms that CFIT continues to represent a persistent operational safety risk requiring sustained monitoring and targeted risk-reduction actions.

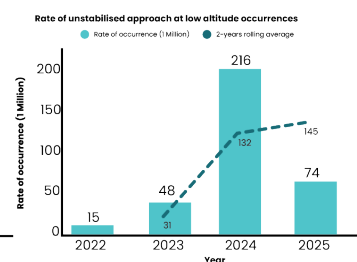
INDICATOR 1:

2-year rolling average of rate of significant risk occurrence related to CFIT/million flights per year



INDICATOR 2:

2-year rolling average of rate of unstabilised approach at low altitude/million flights per year



OPR-2

To reduce the rate of occurrences related to Loss of Control In-flight (LOC-I)

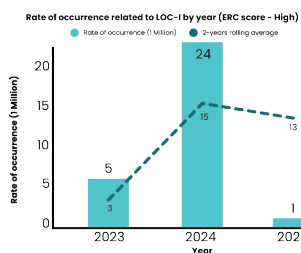
Performance results indicate an overall decreasing trend in LOC-I risk indicators, as reflected by the two-year rolling average, suggesting a gradual reduction in underlying operational risk levels over time.

Year-to-year results also show improvement between 2024 and 2025, with a decline in recorded LOC-I related occurrences during the most recent reporting period. This positive trend indicates the continued effectiveness of safety actions, including enhanced safety training, operational monitoring, and risk-based oversight measures.

Overall, the results demonstrate progress toward achieving the LOC-I safety objective; however, continued monitoring remains necessary to ensure that risk levels remain controlled and that improvements are maintained over the long term.

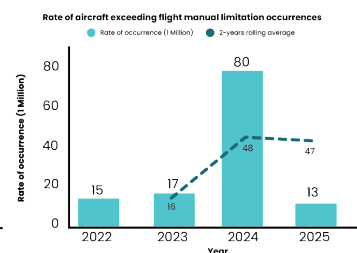
INDICATOR 1:

2-year rolling average of rate of significant risk occurrence related to LOC-I/million flights per year



INDICATOR 2:

2-year rolling average of rate of aircraft exceeding flight manual limitation occurrences/million flights per year



OPR-3

To reduce the rate of occurrences related to Mid-Air Collision (MAC)

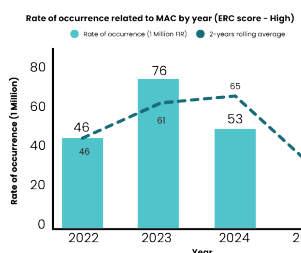
Performance results present a mixed trend in MAC-related risk indicators. While the two-year rolling average shows some overall improvement, trend analysis indicates variability rather than a consistent decrease.

A comparison between 2024 and 2025 shows a reduction in recorded MAC-related occurrences, indicating short-term improvement. However, TCAS Resolution Advisory (RA) occurrences with MAC potential continue to show an increasing trend, suggesting that underlying collision risk factors remain present.

These results indicate that the overall level of collision risk within Thai airspace has not yet achieved a sustained downward trend. Continued efforts are required to strengthen mitigation measures, including enhanced air traffic management practices, improved surveillance capability, and ongoing safety promotion focused on airspace awareness and separation assurance.

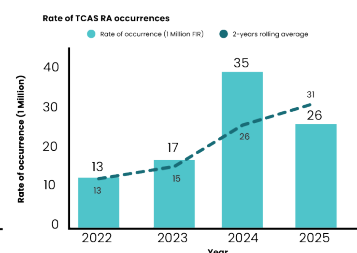
INDICATOR 1:

2-year rolling average of rate of significant risk occurrence related to MAC/million flights per year



INDICATOR 2:

2-year rolling average of rate of TCAS RA occurrences/million flights per year



OPR-4

To reduce the rate of actual Runway Excursions (RE)

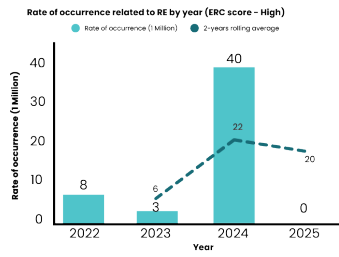
Performance results show an overall decreasing trend in actual runway excursion occurrences, as reflected in the rolling-average indicators. This indicates gradual improvement in managing runway safety risks across the aviation system.

A year-to-year comparison between 2024 and 2025 also demonstrates a reduction in the number of actual runway excursion events, confirming short-term progress alongside the longer-term downward trend. The improvement suggests that ongoing mitigation measures—such as published runway safety programmes, enhanced operational awareness, and continued monitoring of unstable approaches and landing performance—are contributing positively to risk reduction.

Overall, the results indicate steady progress toward achieving the runway excursion safety objective. Continued attention to approach stability, runway condition management, and operational compliance will remain essential to sustain this positive trend and further reduce excursion risk.

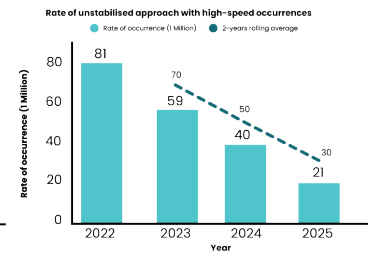
INDICATOR 1:

2-year rolling average of rate of significant risk occurrence related to RE/million flights per year



INDICATOR 2:

2-year rolling average of rate of rate of un stabilised approach with high speed occurrences/million flights per year



OPR-5

To reduce the rate of actual Runway Incursions (RI)

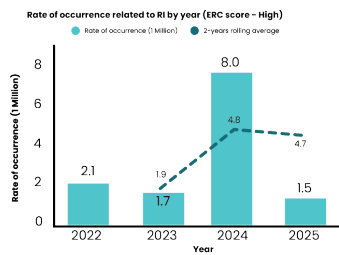
Performance results indicate an overall decreasing trend in runway incursion occurrences, as reflected in the two-year rolling average. This suggests gradual improvement in the effectiveness of runway safety risk management across the aviation system.

A comparison between 2024 and 2025 also shows a reduction in actual runway incursion events, indicating positive short-term progress. The declining trend reflects the impact of ongoing safety initiatives, including published runway safety programmes, enhanced coordination between pilots, air traffic controllers, and aerodrome operators, as well as continued awareness and training efforts.

Overall, the results demonstrate steady progress toward achieving the runway incursion safety objective. Nevertheless, sustained monitoring and continued emphasis on human factors, communication discipline, and surface movement management remain essential to further reduce incursion risks and maintain long-term safety performance.

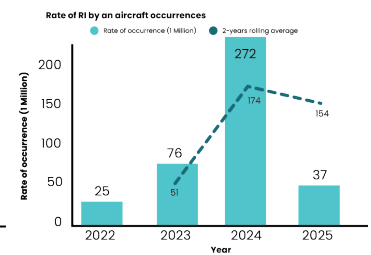
INDICATOR 1:

2-year rolling average of rate of significant risk occurrence related to RI/million flights per year



INDICATOR 2:

2-year rolling average of rate of RI by an aircraft occurrences/million flights per year



OPR-6

To reduce the rate of bird strikes with damage to aircraft parts

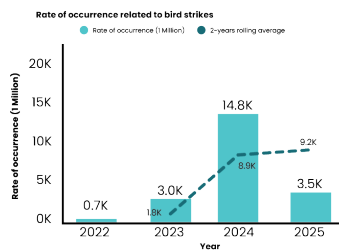
Performance results show an overall decreasing trend in bird strike occurrences involving aircraft damage, as indicated by the two-year rolling average. This suggests gradual improvement in wildlife hazard management and mitigation measures implemented across aerodrome operations.

A year-to-year comparison between 2024 and 2025 also indicates a reduction in damaging bird strike events, reflecting the effectiveness of strengthened wildlife control programmes, improved reporting practices, and enhanced coordination between aerodrome operators and relevant stakeholders.

Overall, the results demonstrate positive progress toward achieving the bird strike safety objective. However, as wildlife hazards are influenced by environmental and seasonal factors, continued monitoring, data-driven risk assessment, and proactive habitat management remain essential to sustain long-term risk reduction.

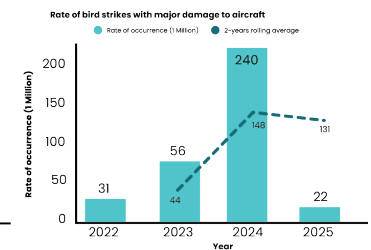
INDICATOR 1:

2-year rolling average of bird strikes occurrence/million aircraft movements per year (Target 10% reduction)



INDICATOR 2:

2-year rolling average of occurrences related to bird strikes with major damage to aircraft/million aircraft movement per year (Target 10% reduction)



Overall performance against the OPR safety objectives shows positive progress in managing key operational safety risks. Most indicators demonstrate stable or decreasing trends, reflecting the effectiveness of current safety measures, oversight activities, and industry risk controls. Improvements are evident in several priority risk areas, including LOC-I, MAC-related risks, runway safety events, and bird strikes. However, some risks—particularly CFIT—remain persistent and require continued monitoring and targeted mitigation. Overall, Thailand continues to make steady progress in reducing operational safety risks, while sustained proactive risk management is needed to maintain long-term safety improvements.



CONCLUSION & WAY FORWARD

Overall performance against the State Safety Performance indicators shows steady progress across Thailand's aviation safety system. Positive outcomes are evident in stakeholder collaboration, safety reporting activity, and operational risk management, where most high-risk occurrence indicators demonstrate stable or decreasing trends. These results reflect the continued effectiveness of preventive safety programmes, industry engagement, and targeted mitigation measures.

A major achievement during the reporting period is the significant improvement in safety oversight effectiveness, with Thailand's USOAP Effective Implementation (EI) score increasing to 87.73 percent, exceeding the national safety performance target. This reflects strengthened regulatory capability, improved surveillance functions, and enhanced resolution of safety concerns.

Overall Achievements and Areas for Improvement:

However, further improvement is required to enhance SSP maturity, strengthen risk-based oversight implementation, and ensure consistent and effective SMS performance across all aviation sectors.



Recommendations:

To sustain and further enhance safety performance, it is recommended to:

1. Strengthen policy support for risk-based and performance-driven oversight approaches.
2. Enhance integration and utilisation of national safety data systems for strategic decision-making.
3. Promote continued leadership commitment to a positive safety culture.

Overall, future efforts should focus on transitioning from compliance-based oversight toward a fully performance-driven and intelligence-based safety management system to ensure a resilient and sustainable aviation safety framework for Thailand.



Occurrence Categories

CAAT uses the aviation occurrence taxonomy which was developed by the Commercial Aviation Safety Team/ICAO Common Taxonomy Team (CICTT). This is applied to the safety occurrences to facilitate the safety data analysis by focusing on common safety issues of each occurrence. The occurrences mentioned in this report are those that occurred in Thai aviation industry and were reported to CAAT.

Abnormal Runway Contact (ARC)	Any landing or take-off involving abnormal runway or landing surface contact.	Ground Handling (RAMP)	Occurrences during (or as a result of) ground handling operations.
Abrupt Maneuver (AMAN)	The intentional abrupt maneuvering of the aircraft by the flight crew.	Icing (ICE)	Accumulation of snow, ice, freezing rain, or frost on aircraft surfaces that adversely affects aircraft control or performance.
Aerodrome (ADRM)	Occurrences involving aerodrome design, service, or functionality issues.	Loss of Control - Ground (LOC-G)	Loss of aircraft control while the aircraft is on the ground.
ATM/CNS (ATM)	Occurrences involving Air Traffic Management (ATM) or Communication, Navigation, Surveillance (CNS) service issues.	Medical (MED)	Occurrences involving illnesses of persons on board the aircraft.
Birdstrike (BIRD)	Occurrences involving collisions/near collisions ingestion of one or several birds which may occur in any phase of flight.	Navigation Error (NAV)	Occurrences involving the incorrect navigation of aircraft on the ground or in the air.
Cabin Safety Events (CABIN)	Miscellaneous occurrences in the passenger cabin of transport category aircraft.	Other (OTHR) ¹	Any occurrence not covered under another category.
Evacuation (EVAC)	Occurrence where either; (a) person(s) are injured during an evacuation; (b) an unnecessary evacuation was performed; (c) evacuation equipment failed to perform as required; or (d) the evacuation contributed to the severity of the occurrence.	Security related (SEC)	Criminal/Security acts which result in accidents or incidents.
Fire/Smoke (Non-impact) (F-NI)	Fire or smoke in or on the aircraft, in flight, or on the ground, which is not the result of impact.	System/Component Failure or Malfunction (Non-Powerplant) (SCF-NP)	Failure or malfunction of an aircraft system or component other than the powerplant.
Fire/Smoke (Post-impact) (F-POST)	Fire or smoke resulting from an accident impact.	System/Component Failure or Malfunction (Powerplant) (SCF-PP)	Failure or malfunction of an aircraft system or component related to the powerplant.
Fuel related (FUEL)	One or more powerplants experienced reduced or no power output due to fuel exhaustion, fuel starvation/mismanagement, fuel contamination/wrong fuel, or carburetor and/or induction icing.	Turbulence Encounter (TURB)	In-flight turbulence encounter.
Ground Collision (GCOL)	Collision while taxiing to or from a runway in use.	Undershoot/Overshoot (USOS)	A touchdown off the runway/helipad/helideck surface.
		Unknown or Undetermined (UNK) ¹	Insufficient information exists to categorise the occurrence.
		Wildlife (WILD)	Collision with, risk of collision, or evasive action taken by an aircraft to avoid wildlife on a runway or on a helipad/helideck in use.
		Wind shear or Thunderstorm (WSTRW)	Flight into wind shear or thunderstorm.

¹OTHR and UNK are not always shown in the annual safety report as they do not provide useful safety information.



CFIT

Controlled Flight into Terrain

In-flight collision or near collision with terrain, water, or obstacle without indication of loss of control.

Global High-Risk Categories of Occurrences (G-HRCs)

The G-HRCs are the most common occurrence categories related to fatal accidents (which are derived from the analysis of fatal accidents by ICAO over a 10-year period). G-HRC needs to be addressed to mitigate the risk of fatalities. The following occurrence categories have been identified as G-HRC in the ICAO Global Aviation Safety Plan (GASP) 2026 – 2028 Edition and are considered relevant for Thailand.



LOC-I

Loss of Control In-flight

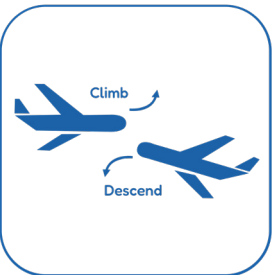
Loss of aircraft control while or deviation from intended flight path in flight.

RE

Runway Excursion

RI

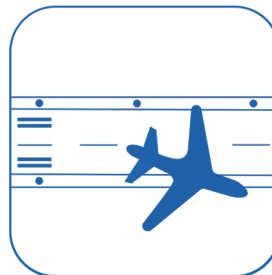
Runway Incursion



MAC

Mid-Air Collision

Airprox, Airborne Collision Avoidance System (ACAS) alerts, loss of separation as well as near collisions or collisions between aircraft in flight.



A veer off or overrun off the runway surface.



Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft.

AIRCRAFT ACCIDENT & SERIOUS INCIDENT



Accident

This information includes all accidents whether it is commercial air transport or general aviation in Thailand. In recent years, most of the accidents have been involved with General Aviation. So, there is still room for improvement for this type of operation to make our sky safer. You may see the list of accident and serious incidents on Appendix A.

Number of accidents (Thai aircraft)

The number in 2025 has decreased from 2024. We can see the decreasing trend of numbers. Next, we will compare with annual flight movement to see the rate of occurrence.

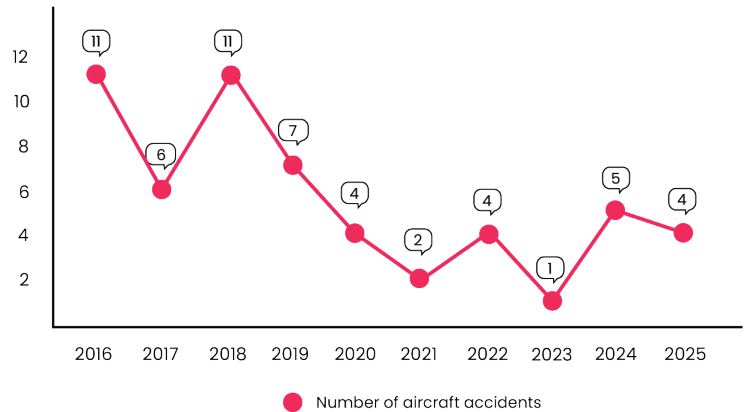


Chart 1: Number of aircraft accidents occurred with Thai aircraft during 2016 - 2025

Rate of accidents (Thai aircraft)

As the accident rate each year fluctuates. We shall use the 5-year moving average to see a smoother trend. It turns out that the trend is improving.

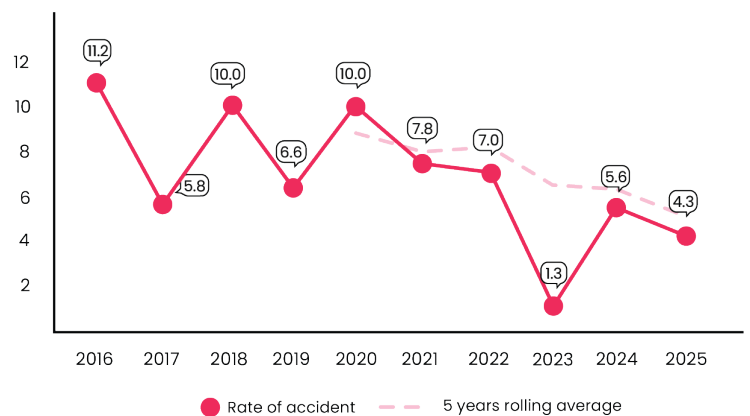


Chart 2: Rate of aircraft accidents occurred with Thai aircraft during 2016 - 2025

Number of fatalities

In 2025 there was a single fatality involving an ultralight aircraft accident at Phuket.

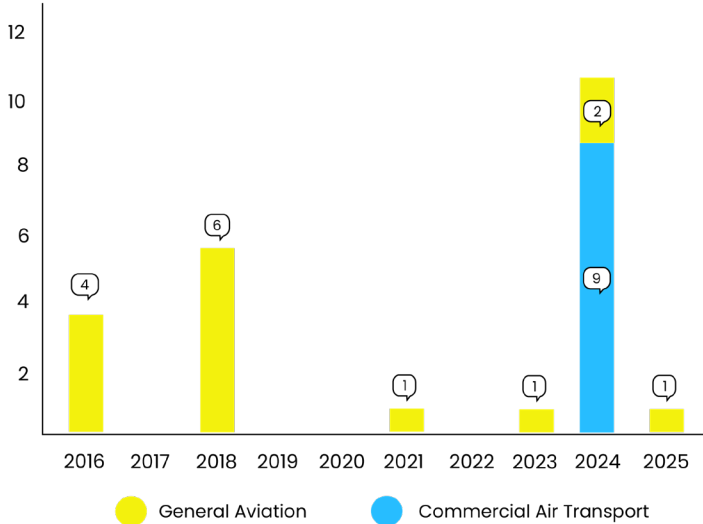


Chart 3: Number of fatalities categorized by type of operation during 2016 - 2025

Top 5 categories

The top 5 consolidated accident categories from 2016 to 2025 are in the following table. Please note that one case may include more than one category.

In conclusion, fatal accidents are rare but still occurring in Thailand especially with general aviation activities. The serious incidents and the precursor events that are further detailed in this report should still be closely monitored to improve our safety.

Rank	Occurrence Category	Case count
1	RE	13
2	SCF-PP	12
3	ARC	11
4	LOC-I	7
5	TURB	5

Serious Incident

Chart 4 shows the number of serious incidents categorized by aircraft registration involved and shows a decreasing trend in the number of occurrences.

Number of serious incidents

Note: This includes aircrafts depart from/ arrive to/ fly over BANGKOK FIR

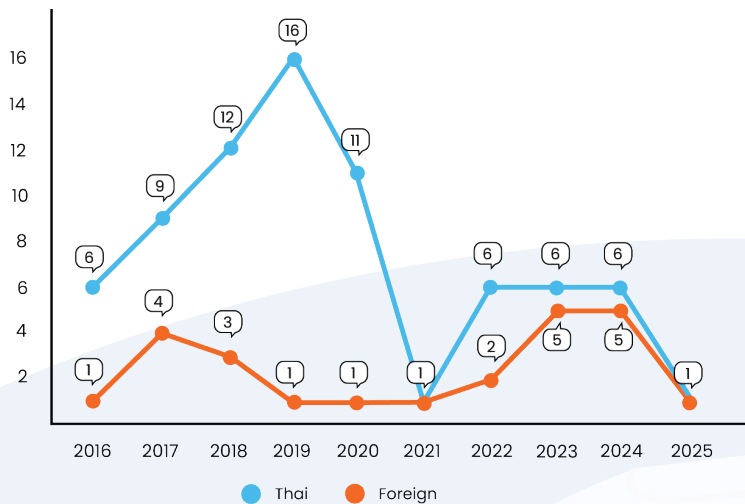


Chart 4: Number of serious incident during 2016 - 2025

Rate of serious incidents per 1 million flight movement

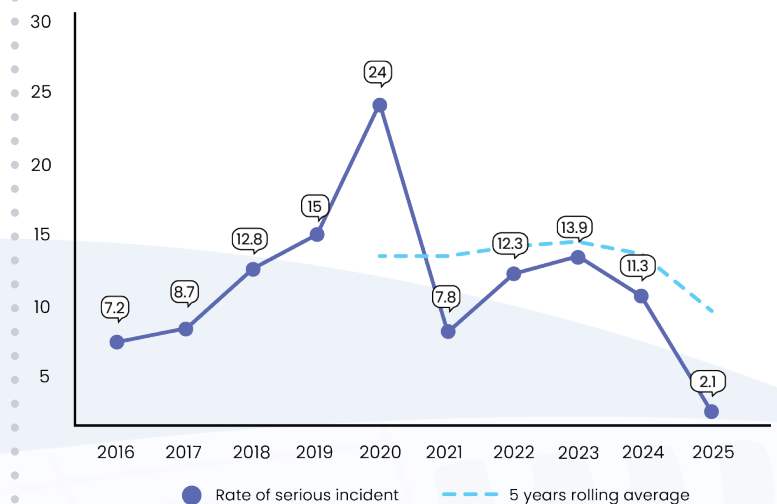


Chart 5: Rate of aircraft serious incident during 2016 - 2025

The rate of serious incidents is decreasing which is a positive indication of safety performance in Thailand.

Top 5 categories

Here are the top 5 consolidated number of serious incident occurrence categories from 2016 to 2025. Please note that one case may include more than one category.

For more information, the list of aircraft accidents and serious incidents can be found in Appendix A.

Rank	Occurrence Category	Case count
1	SCF-NP	24
2	RE	17
3	F-NI	12
4	MAC	12
5	RI	6
6	SCF-PP	5

Key Message from

the Aircraft Accident and Incident Investigation Commission (AAIC)

The Aircraft Accident and Incident Investigation Commission (AAIC) is responsible for investigating aircraft accidents and incidents, supported by the Office of AAIC, which provides administrative and operational assistance. In 2025, the AAIC achieved significant progress and improvements in the performance of its responsibilities.

Under the Universal Safety Oversight Audit Programme (USOAP) conducted by the International Civil Aviation Organization (ICAO), the AAIC delivered a significant increase in the Effective Implementation (EI) score, rising from 40.51% to 61.73%. This achievement reflects a strengthened capability to adopt ICAO standards and recommended practices into effective investigations.

As a result, six investigations were conducted in full compliance with ICAO requirements during the year, including four accidents and two serious incidents. Three investigations involved commercial air transport, while the other three involved general aviation.

The AAIC also reaffirmed that sustainable improvements in aviation safety depend on effective international collaboration. In support of this objective, the Commission strengthened professional networks and enhanced institutional knowledge through active engagement with the global aviation safety community, including participation in the ICAO Asia and Pacific (APAC) Safety Management Seminar, the 6th International Accident Investigation Forum hosted by TSIB Singapore, and the ICAO Regional Accident Investigation Workshop and Asia Pacific Accident Investigation Group Meeting.



Lesson learnt from the past events


Enhancing Awareness during Low Visibility Operations



Following the occurrence, the Airbus A380 executed two consecutive go-arounds at Suvarnabhumi Airport and subsequently diverted to Don Mueang International Airport due to deteriorating meteorological conditions encountered during the landing phase. At the time of approach, the actual weather was below CAT I operating minima, while the reported visibility was above CAT I minima. Although the aircraft's performance and certification permitted landing under CAT II conditions, the flight crew did not receive accurate or representative real-time meteorological information corresponding to the actual conditions encountered.

In this regard, the Civil Aviation Authority of Thailand (CAAT) emphasizes the need for all relevant stakeholders to enhance situational awareness and operational vigilance during low visibility operations (LVO), particularly at Suvarnabhumi Airport and Don Mueang International Airport. Such operations require close coordination among air operators, air traffic controllers, airport operators, as well as airport personnel. Therefore, all parties are strongly encouraged to strictly comply with the procedures and guidelines specified in the relevant operational manuals.

AIR OPERATORS:



Air operators are requested to enhance safety awareness and safety management when conducting operations under low visibility conditions, with particular emphasis on the following key aspects:

Reviewing and ensuring strict compliance with Low Visibility Operation procedures as specified in the relevant operations manuals.


Verifying the suitability and certification status of aircraft for CAT II/III operations.

Assessing the readiness and serviceability of aircraft systems and equipment required for CAT II/III operations, such as autopilot systems, radio altimeters, and Instrument Landing Systems (ILS).

Ensuring that pilot qualifications, training, and recency requirements for CAT II/III operations fully comply with regulatory standards.

Encouraging effective operational decision-making, including initiating a go-around promptly when conditions do not meet expectations or safety margins.

AIRPORTS:



Airport operators, along with all airport personnel, are requested to ensure a high level of readiness for systems and equipment supporting low visibility operations, including but not limited to:

The operational readiness and certification status of ILS CAT II/III systems at the airport.


Availability and proper functioning of airfield lighting systems, including:

- o Approach lights
- o Runway centerline lights
- o Touchdown zone lights
- o Runway edge lights

Clarity, visibility, and serviceability of signs and markings associated with low visibility operations.

Readiness of stop bar lights and taxi route guidance signage.

ATCs:



Air Traffic Controllers play a critical role in maintaining safety during low visibility conditions. Controllers are therefore encouraged to increase situational awareness and exercise heightened caution, particularly in the following areas:

Declaring "Low Visibility Operation in force" in a timely manner, consistent with prevailing weather conditions and visibility changes.

Implementing Low Visibility Procedures (LVP) in strict accordance with established protocols.

Increasing aircraft separation in the air as appropriate to operational conditions.

Managing aircraft ground movements (taxiing) using step-by-step clearances and utilizing stop bar systems when necessary.

Maintaining a high level of awareness to detect and prevent runway incursions, including unauthorized entry into Runway Protection Areas when aircraft are approaching or landing.

All agencies and units operating within the airside area must also maintain a high level of awareness and preparedness for low visibility weather conditions. Personnel should remain alert, follow established procedures, and coordinate closely with relevant authorities to ensure safe and efficient operations.



COMMERCIAL AIR TRANSPORT



Aeroplane

The analysis of occurrence rates related to the commercial air transport (CAT) operations involving fixed-wing aircraft operated by Thai air operators shows that BIRD remains the most frequently reported occurrence. This trend is consistent with the previous five years. While the new trend of ATM, in particular of GNSS interference, comes to the second of the top five occurrence categories, which will be further described in the analysis in other sections. The third occurrence category is still SCF-NP, which will be provided with deeper analysis in the next section, while the WSTRW is rising to be the fourth, the WILD, SCF-PP, CFIT, and ARC are decreasing. Chart 6 shows details of the last five years' analysis.

Occurrence Classification

Rate per 10,000 flight movements

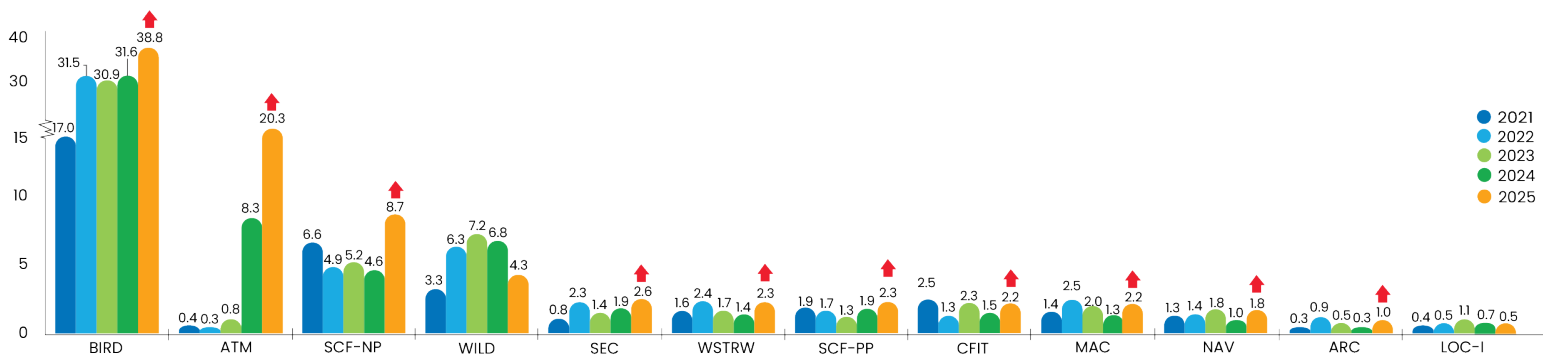


Chart 6: Rate of occurrences related to CAT from 2021 - 2025 - Aeroplane operations

Overall, the data clearly indicate that bird strike risk is highest during landing and take-off, reinforcing the importance of effective wildlife management, runway inspections, and pilot vigilance during critical phases of flight near airports.

CAAT has established a National Wildlife Hazard Management Subcommittee to address and mitigate wildlife risks. Operators are encouraged to report all incidents related to birds, ensuring they cover the required mandatory fields as thoroughly as possible. Comprehensive data will contribute to more in-depth analysis, which can help identify and reduce the risk posed by birds.

When looking into the detailed analysis using the ERC methodology to estimate how close it was to the potential accident outcome, the ERC scores indicated as Chart 7. Even if there was high rate of bird strikes and GNSS interference are the top two occurrences. However, it was categorized in the low-risk category. Consequently, CFIT remains the number one risk based on potential accident outcomes.

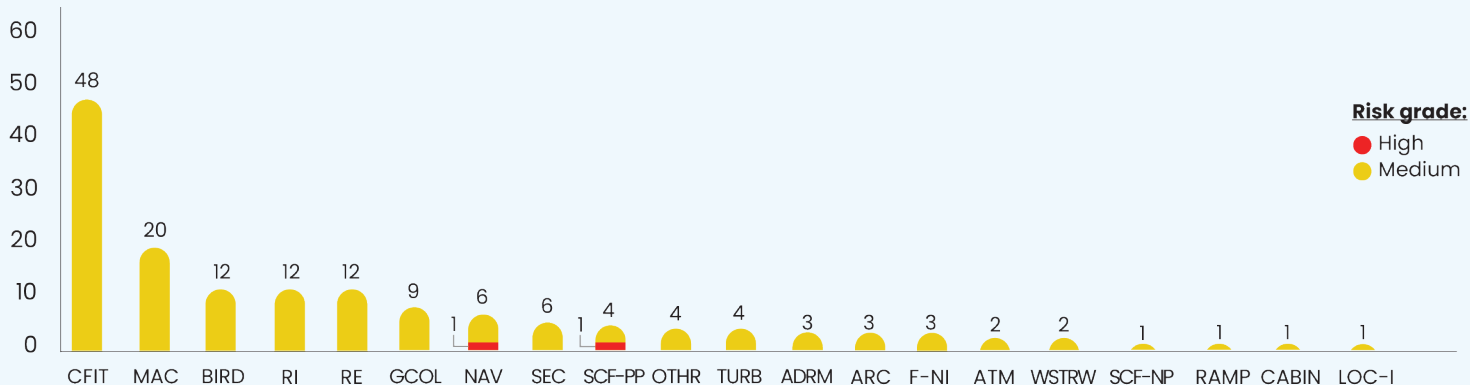


Chart 7: Occurrence category by ERC scores

90%

Analysis of the WSTRW category reveals that 90% of go-arounds were identified as direct consequences of windshear encounters.

The remaining percentage resulted in diversions due to adverse weather conditions. Furthermore, turbulence encounters associated with severe weather contributed to the WSTRW data, including one recorded accident. Consequently, it is strongly recommended that operators review procedures and coordination between flight and cabin crews, specifically regarding strategic planning and enhanced pre-flight briefings

GNSS interference was identified as a significant factor last year; recent analysis specifically highlights areas of GPS spoofing along the West coast adjacent to the BKK FIR and South Asia. The primary consequences include loss of GPS signal and nuisance EGPWS warnings. In response to the global impact, aircraft manufacturers have updated FCOM/AOM documentation regarding jamming and spoofing impacts. Operators are encouraged to distribute this safety-critical information to ensure flight crews are aware of affected systems. In terms of severity, GNSS interference increases ATC workload for radar vectoring and carries the latent potential to contribute to a CFIT event due to erroneous GPS data affected the aircraft navigation equipment.

The rise in GNSS interference specifically GPS spoofing presents a critical human factors risk regarding automation complacency. Frequent nuisance warnings from the EGPWS in affected areas can lead to "alarm fatigue," where flight crews begin to doubt the validity of system alerts. This erosion of trust creates a dangerous level of complacency; crews may become desensitized and fail to execute a timely recovery during a genuine CFIT threat. Consequently, what appears to be a low-risk technical interference event significantly elevates the high-severity risk of CFIT by compromising the flight crew's decision-making process.

Aircraft positioning uncertainty or loss

GPS signal corrupted or lost

Deliberate radio frequency interference

NEW EMERGING RISKS

RADIO FREQUENCY INTERFERENCE (GNSS)

In 2025, CAAT received occurrence reports from aircraft operators regarding Radio Frequency Interference (GNSS) events in multiple Flight Information Regions (FIRs).

A summary of Radio Frequency Interference (GNSS) occurrences by location is presented in Chart 8, while the annual trend of such occurrences is illustrated in Chart 9 and the quarterly trend of such occurrences is illustrated in Chart 10.

Chart 8: Number of Radio Frequency Interference (GNSS) occurrences in 2025 by location of occurrence

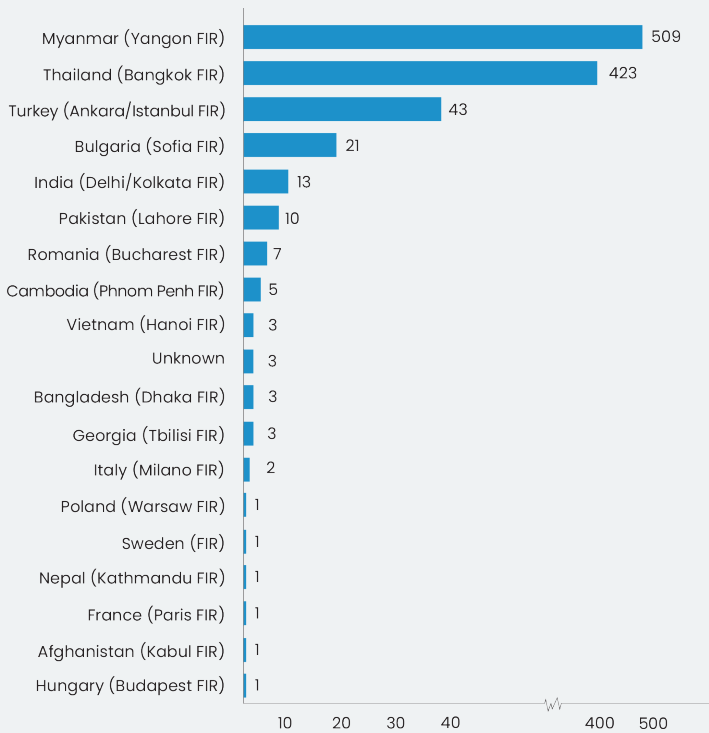


Chart 9: Number of Radio Frequency Interference (GNSS) occurrences by year

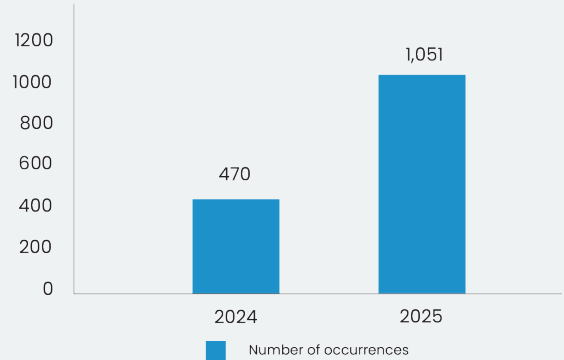


Chart 10: Number of Radio Frequency Interference (GNSS) occurrences by Quarter

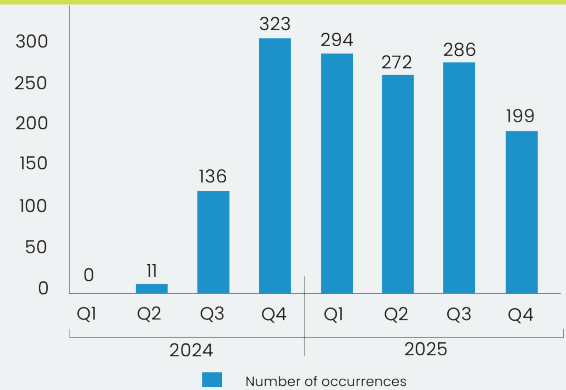


Chart 11 – The most frequent occurrence was related to sink rate that presents a significant concern during unstabilised approaches, primarily due to high speeds and steep descent rates in the final approach phase. This issue is linked to ARC categorization, as it has resulted in a notable number of suspected hard landing reports. The CAAT actively monitors this situation and promotes adherence to stable approach criteria. Operators are required to enhance proactive oversight of this procedure and analyze the flying techniques necessary to reduce the occurrence of unstabilized approaches.

Reference to Chart 12, CAAT is in the process of analysing and identifying certain aerodromes that may contribute to approach stabilization challenges based on environmental factors, thus ensuring that the industry remains informed.

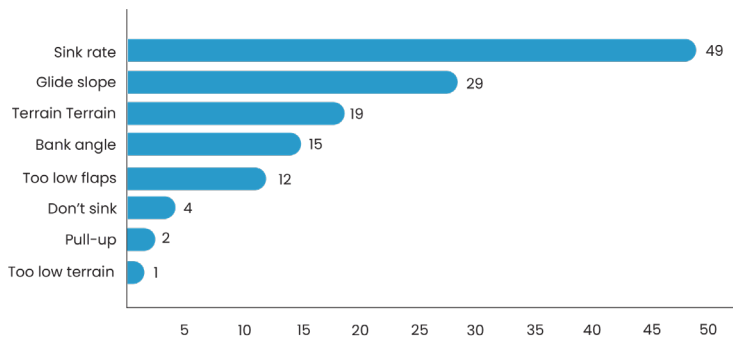


Chart 11: GPWS Warning system triggered

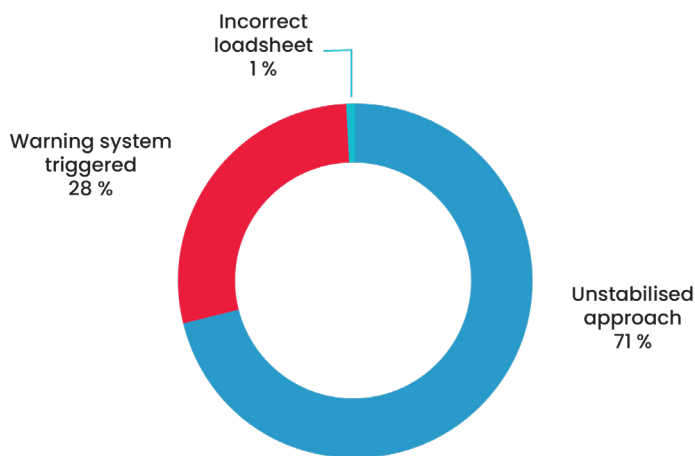


Chart 12: Key safety risk related to CFIT



Fire and Smoke Occurrences: Lithium Battery Hazards

In the past year, there has been a notable increase in reports concerning lithium battery thermal runaway and power bank fires within the passenger cabin as shown in Chart 13. This upward trend aligns with global data.

To enhance proactive safety, operators are strongly urged to enforce their spare lithium battery carriage policies as outlined in operations manuals.

Furthermore, operators should identify additional mitigation strategies, such as enhancing passenger awareness campaigns and reviewing the availability of specialized battery fire containment bags.

At the regulatory level, the CAAT is currently evaluating safety recommendations from ICAO. These will be utilized to develop further preventive measures and standardize response protocols across all Thai air operators to minimize the risk of on-board fires.

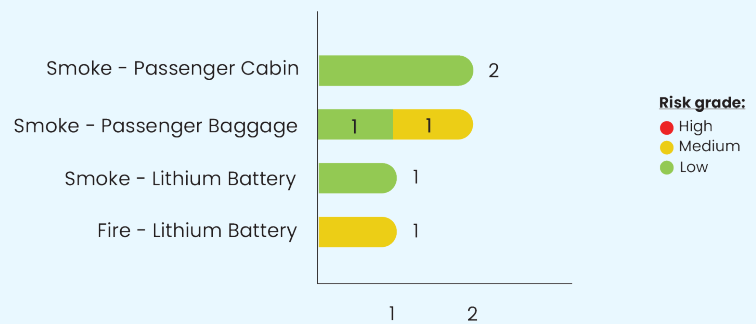


Chart 13: Fire and Smoke Occurrences

KEY MESSAGE FROM OPS

Flight Operations Standards Department

In 2025, the Flight Operations Standards Department (OPS) of the Civil Aviation Authority of Thailand (CAAT) continued to provide systematic oversight of Thai air operators in accordance with national and international aviation safety standards. Oversight activities covered 24 Air Operator Certificate (AOC) holders and included scheduled and non-scheduled audits/inspections.

Overall surveillance outcomes indicate that the operational safety performance of Thai air operators remained satisfactory throughout the year. No significant systemic safety deficiencies were identified, demonstrating continued compliance with essential safety requirements.

OPS activities were aligned with the Thailand Aviation Safety Action Plan (TASAP 2024–2026), which defines national safety priorities, including Controlled Flight Into Terrain (CFIT), Loss of Control In-Flight (LOC-I), Mid-Air Collision (MAC), Runway Excursions (RE), Runway Incursions (RI), and aircraft damage resulting from bird strikes.

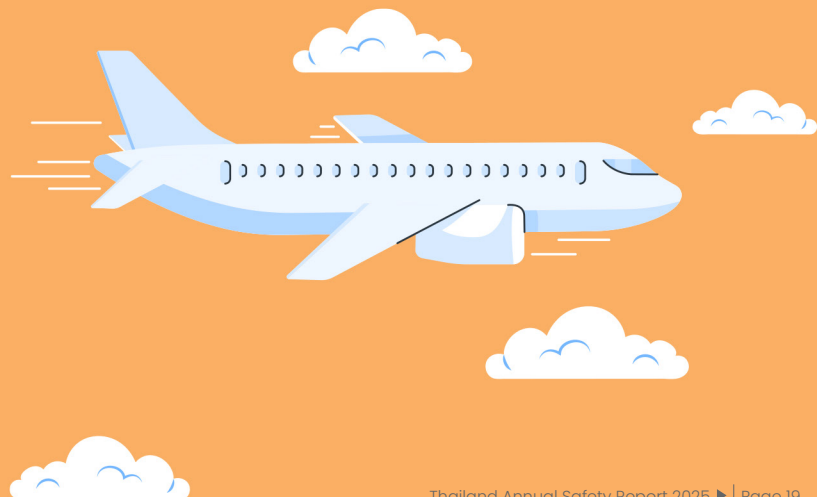
While safety performance remained stable, OPS identified areas requiring continued attention to support ongoing improvement. These include the further development of Safety Management System (SMS) implementation, enhanced management of Flight Safety Documentation Systems (FSDS), strict compliance with Dangerous Goods (DG) requirements, strengthened Operational Control processes, and the continued effectiveness of Compliance Monitoring System (CMS).

To support TASAP objectives, particularly LOC-I risk mitigation, OPS conducted a dedicated Loss of Control In-Flight (LOC-I) Safety Workshop in 2025, promoting knowledge sharing and reinforcing proactive safety management across the sector.

OPS remains committed to maintaining a strong safety culture through effective regulatory oversight and close collaboration with industry stakeholders, supporting a safe, resilient, and sustainable aviation system in Thailand.

MR. VEERA CHEEVAIDSARAKUL

Manager of Flight Operations Standards Department (OPS)



COMMERCIAL AIR TRANSPORT

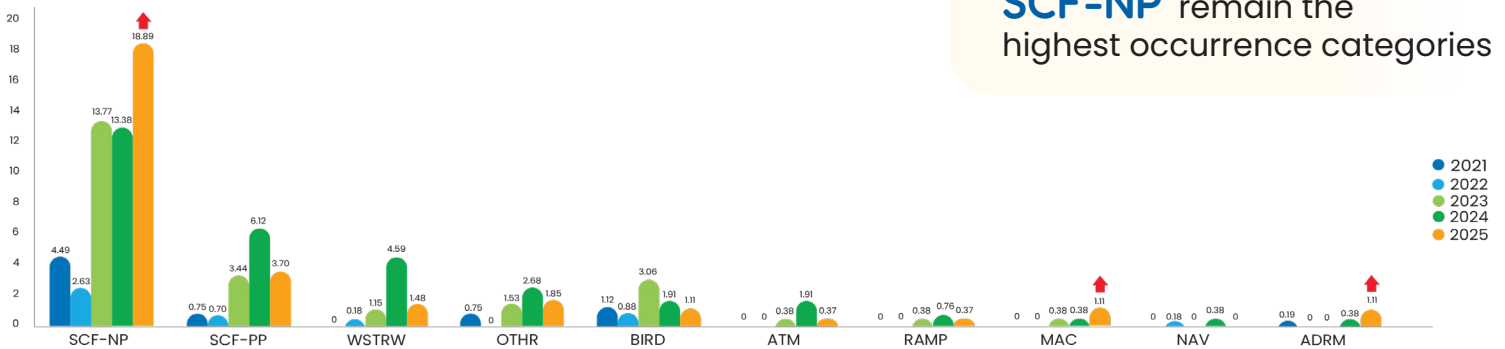


Helicopter

This section addresses operational safety issues reported during helicopter operations per 1,000 flight movements.

Occurrence Classification

Rate per 1,000 flight movements



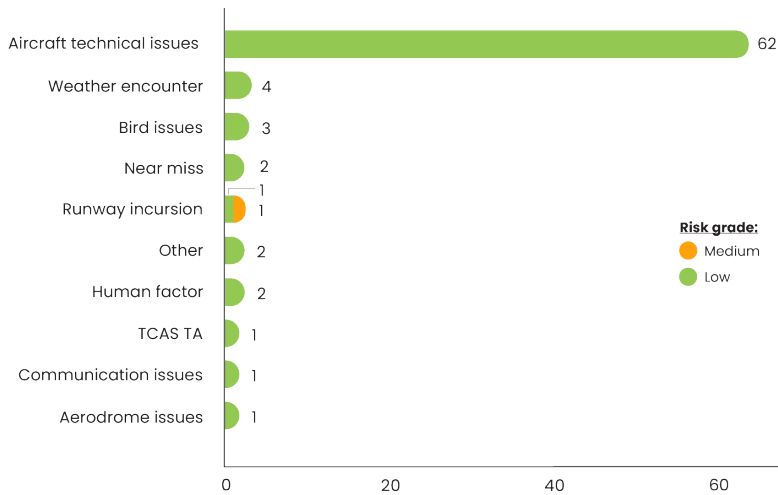
SCF-NP remain the highest occurrence categories

Chart 14: Rate of occurrences related to CAT from 2021-2025 - Helicopter operations

Although the number of higher risk events remained low, the reporting data indicates that the primary challenges during 2025 stemmed not from operational hazards but from aircraft (Helicopter) system reliability issues. This trend guided the subsequent analytical focus toward System/Component Failure (SCF) patterns and maintenance related contributors.

Key Safety Issues

Chart 15 provides a comprehensive analysis of the safety issues contributing to operational challenges in helicopter operations. These issues are classified by Event Risk Classification (ERC) scores to offer a clear summary of reported events.



As shown in Chart 15, the increase in occurrence rates for helicopter operations does not necessarily imply a higher risk. Based on the 2025 dataset, the risk distribution remains nearly identical to the previous year's profile, demonstrating a stable safety landscape:

- High-risk (Red):** 0%
- Medium-risk (Amber):** ~2% of reported occurrences.
- Low-risk (Green):** ~98% of reported occurrences.

Chart 15: Number of key safety issues of helicopter operations in 2025 by ERC score

System & Component Reliability

System/Component Failure – Non-Powerplant (SCF-NP) remained the most frequently reported occurrence category, followed by SCF-PP. The distribution of SCFNP events across ATA Chapters indicates that system reliability concerns span multiple aircraft subsystems:

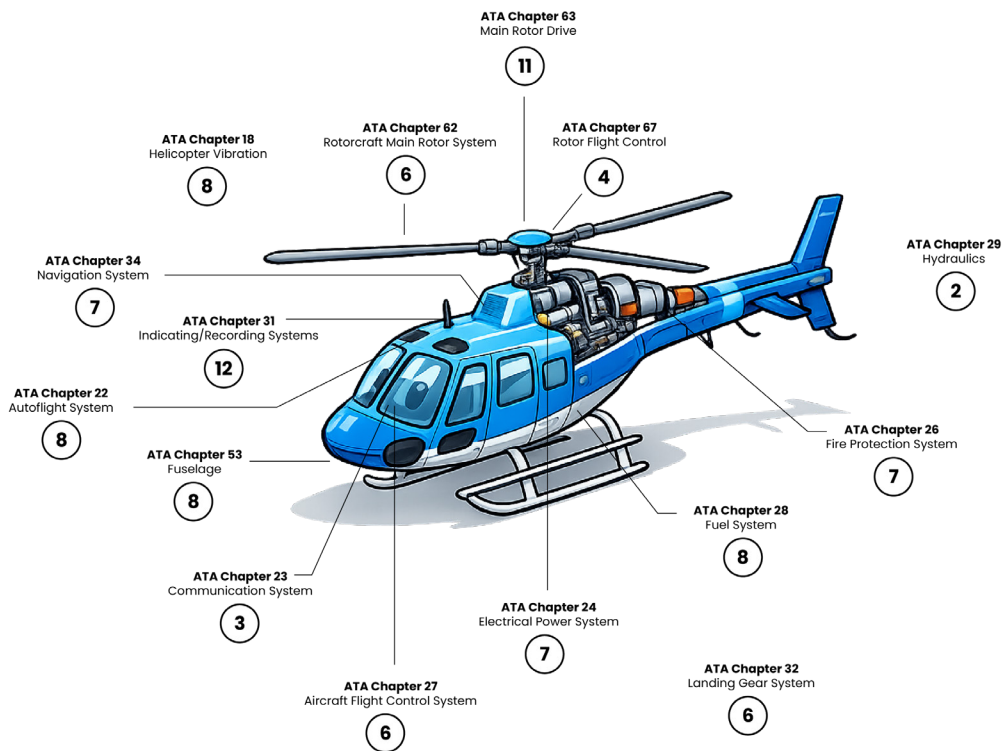


Figure 1: ATA Chapter breakdown of SCF-NP occurrences in 2025 related to CAT - Helicopter operations

As observed, technical reliability remains the primary driver of operational disruptions, reinforcing the need for deeper engineering analysis. Given the limited failsafe options for rotorcraft, specific component failures demand immediate attention – particularly ATA 63 (Main Rotor Drive). Moving forward, strengthening the review of historical maintenance records and enhancing engineering assessments of drivetrain alignment will be critical to mitigating high-risk occurrences in helicopter operations.

In conclusion, this analysis highlights that while operational disruptions are primarily driven by technical reliability, failsafe options for rotorcraft remain limited. However, specific component failures require greater attention, particularly ATA 63 – Main Rotor Drive. Strengthening comprehensive reviews of historical maintenance records and enhancing engineering assessments of drive-train alignment will be key to further mitigating high-risk occurrences in helicopter operations.

AIRCRAFT System/Components Malfunction



The year 2025 presents a complex challenge for Thai aviation safety, characterized by a "Quantity vs. Quality" Paradox. While traffic volume ("Quantity") has surged, technical reliability ("Quality") has shown signs of decline.

Thailand's aviation sector is seeing more flights, but we are facing a serious hidden challenge. In our recent data, aircraft system failures (SCF) jumped by 68.8% to 616 incidents compared to 2024. The core problem is that these breakdowns are happening much faster than the actual increase in flights. With older aircraft in use and a global shortage of spare parts, non-engine system failures (SCF-NP) have become our top safety concern right now.

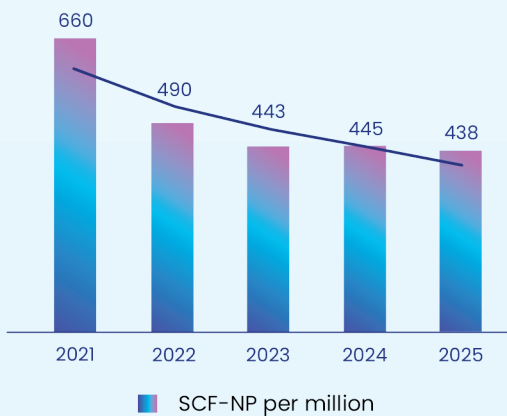


Chart 16: SCF-NP occurrences per million flights

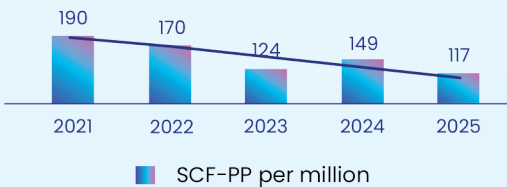


Chart 17: SCF-PP occurrences per million flights



5 YEARS TREND ANALYSIS

From an engineering standpoint, the data reveals a "Phase Shift" in failure modes.

2021-2023 (Post-Pandemic): Failures were dominated by Storage-Related Issues (e.g., pitot-static contamination, bacterial growth in fuel), typical of aircraft returning from long-term parking.

2024 (Recovery): A peak in ATA 32 (Landing Gear) events, correlated with the aggressive return-to-service cycles and hard usage.

2025 (Stabilization & Fatigue): A sharp spike in ATA 27 (Flight Controls) and ATA 29 (Hydraulic Power). This shift suggests that while heavy maintenance (C-Checks) successfully addressed major structural and gear issues last year, the fleet is now experiencing "Sub-system Degradation" the subtle wear of actuators, seals, and electronic components that are harder to detect during standard line maintenance.

System/Component Failure or Malfunction (Non-Powerplant) (SCF-NP) Occurrences Analysis:

All system and component failure have a potential increase in crew workload. When combined with external factors such as adverse weather, these technical malfunctions could escalate into serious incidents. The Civil Aviation Authority of Thailand (CAAT) is actively investigating these trends to implement preventive measures.

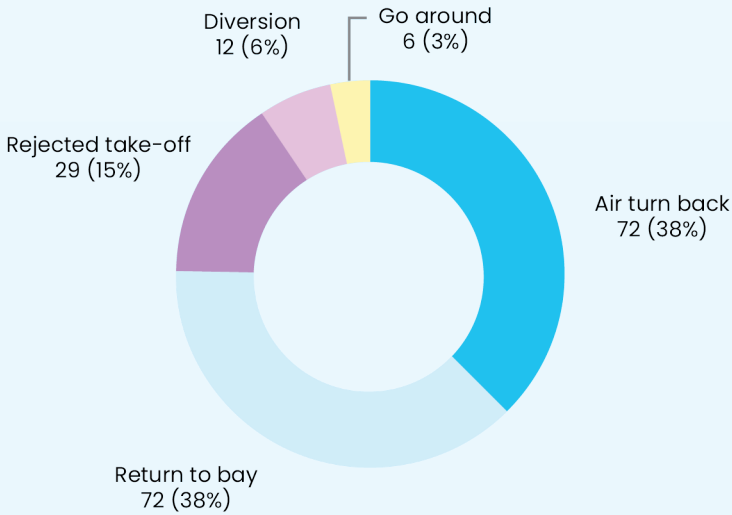


Chart 18: Consequence to aircraft operations resulted by SCF-NP occurrences

System/Component Failure or Malfunction (Powerplant) (SCF-PP) Occurrences Analysis:

In 2025, Thai operators reported 117 SCF-PP events (accounting for 22% of total events). While the total volume is comparable to the previous year, the severity remains a concern.

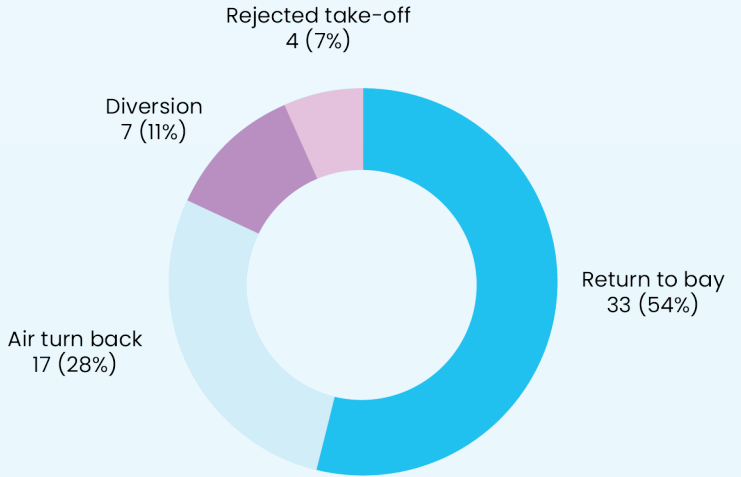


Chart 19: Consequence to aircraft operations resulted by SCF-PP occurrences



DETAILED SYSTEM ANALYSIS

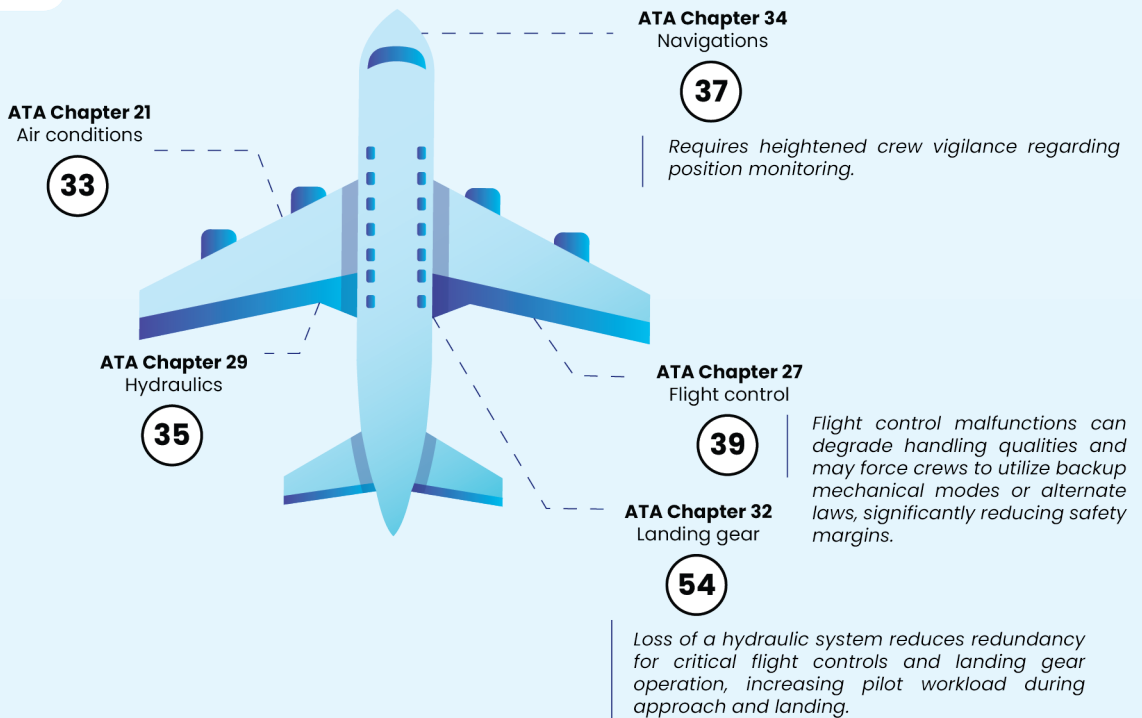


Figure 2: Detailed system analysis

KEY MESSAGE FROM AIR

Airworthiness & Aircraft Engineering Department

During the year 2025, statistical data from The Civil Aviation Authority of Thailand (CAAT) indicated positive improvement in safety occurrence report related to engine inflight shutdown (IFSD), landing gear extension/retraction and hydraulic system. But there were some safety occurrence reports concerning air conditioning and pressurization.



Engine inflight shutdown

Apart from following the mitigation measures recommended from the year 2024. The investigation also found that one of the root causes of engine inflight shutdown was the engine fuel pump failure due to aging. The corrective action taken was to reduce the means time between replacement of this engine fuel pump, and the situation improved significantly.



Landing gear extension/retraction and hydraulic systems

The safety occurrence reports related to landing gear extension/retraction and hydraulic systems also improved significantly. This is highly possible due to following the mitigation measures recommended from the year 2024.



Air conditioning & pressurization system

There was some evidence concerning air conditioning and pressurization system. The suspected causes were due to component aging and maintenance practices. The operators were urged to strictly follow the manufacturer's instructions and recommendations concerning maintenance practices on these systems.



SAFETY RECOMMENDATIONS AND PREVENTATIVE MEASURES

To enhance aviation safety and reduce safety occurrence evidence, CAAT would like to recommend the following measures.

- o Strictly follow the manufacturer's instructions and recommendations concerning inspection and maintenance practices.
- o Closely monitor the applicable Mandatory Continuing Airworthiness Information (MCAI) and follow them accordingly.
- o Collect and analyze maintenance and operational data considering different environmental conditions to optimize the maintenance programs.



MR. PAISIT HERABAT

Manager of Airworthiness and Aircraft Engineering Department (AIR)

GENERAL AVIATION



The 2025 statistical analysis for General Aviation showed an increasing risk profile, characterized by a significant increase in Air Traffic Management (ATM) occurrences—all of which were related to Radio Frequency Interference (GNSS). System Component Failures, Non-Powerplant (SCF-NP) also remained a frequent problem. On the bright side, the sector achieved a notable 50% reduction in the Mid-Air Collision (MAC) rate compared to 2024 as shown in Chart 20.

Notably, 2025 saw the emergence of Security (SEC) related occurrences. This suggests an evolving risk environment for General Aviation, involving unauthorized access to aircraft or airfield facilities, which should necessitate a review of current security protocols at smaller aerodromes, landing sites and private hangars.

Occurrence Classification

Rate per 1,000 flight movements

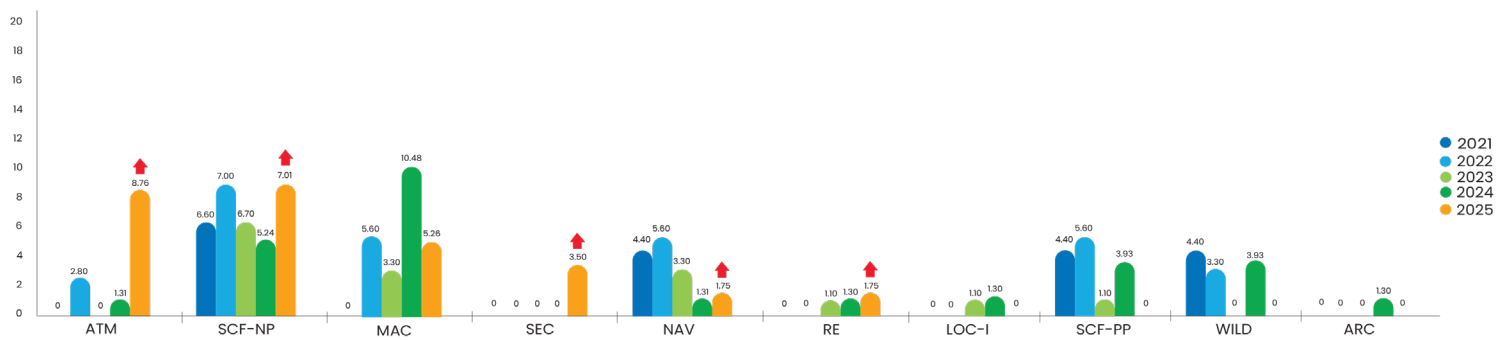


Chart 20: Rate of Occurrence related to general aviation operation from 2021-2025

Key Safety Issues

The operational safety issues for General Aviation occurrences were characterized by a high volume of navigation signal interference and external hazards like Global Navigation Satellite System (GNSS) and laser strikes including human errors behavior like failure to remove safety pins. While many events were technical in nature, the data also highlights a critical need for better discipline to prevent 'Yellow' severity incidents like runway excursions as shown in Chart 21.

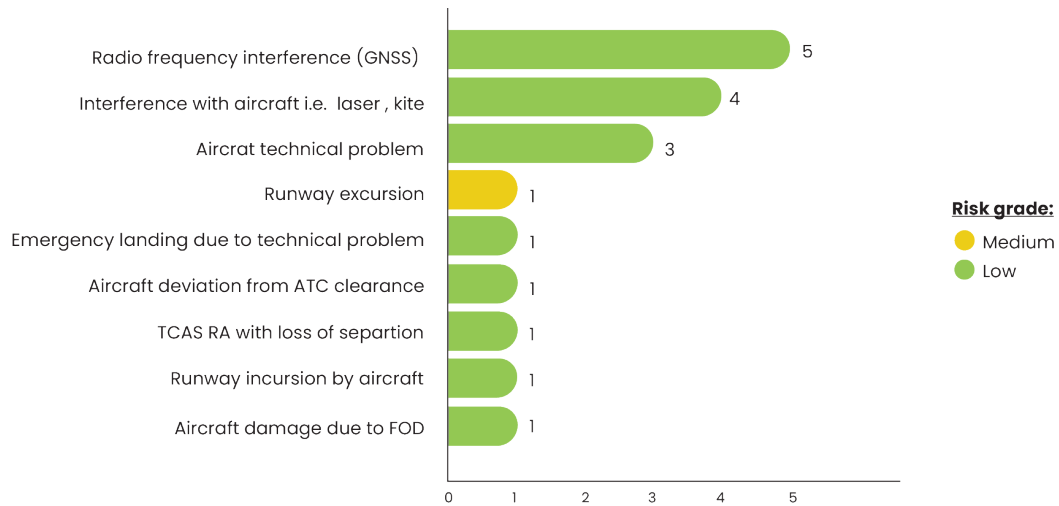
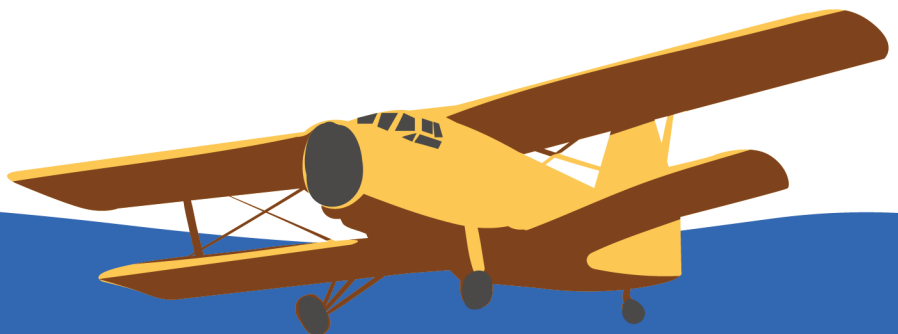


Chart 21: Number of key safety issues of general aviation operation in 2025 by ERC score



APPROVED TRAINING ORGANISATION



This section explains safety occurrences related to Approved Training Organizations (ATOs) for the period 2021–2025, with a detailed focus on 2025. The purpose is to show long-term trends and to describe the main operational safety issues seen in 2025, using rate of occurrences, number of occurrences and risk level (Low / Medium / High).

Occurrence Classification

Rate per 10,000 flight movements

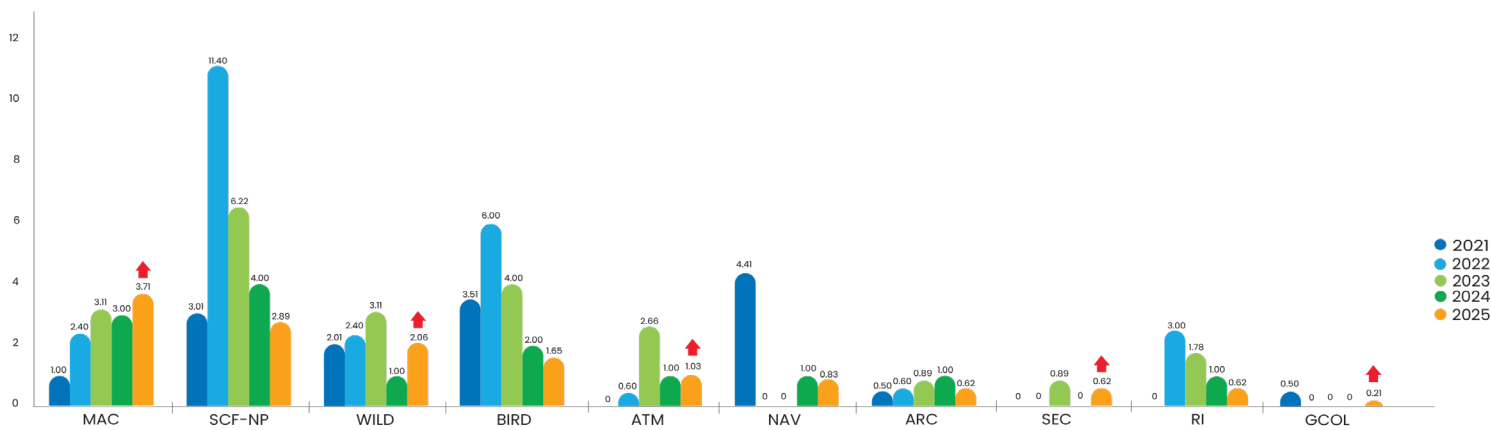


Chart 22: Rate of Occurrence related to approved training organisation from 2021–2025

Across five years, most ATO occurrences are grouped into a few key categories: MAC, SCF-NP, WILD, BIRD and ATM.

A significant reduction is seen in SCF-NP. This category reached a high point in 2022 and then reduced every year after that. The rate of occurrence has reduced from 11.40 in 2022 to 2.89 in 2025. This means SCF-NP occurrences have become less frequent over the last three years. It is hoped that this is a reflection of improved standards of maintenance rather than less occurrences being reported.

BIRD occurrences also reduced steadily after 2022. The rate of occurrence reduced from 6.00 in 2022 to 1.65 in 2025. This shows fewer bird-related occurrences compared to earlier years.

In contrast, MAC (skyrocket/firework interference) occurrences showed a negative trend. The rate of occurrence increased from 2.40 in 2022 to 3.71 in 2025. This indicates more exposure to skyrocket/firework interference affecting training flights in the north east region of Thailand.

In 2025, some occurrences related to ATO operations are assessed as Medium and High risk events that are very important because they can lead to aircraft damage, reduced safety margins, or serious outcomes.

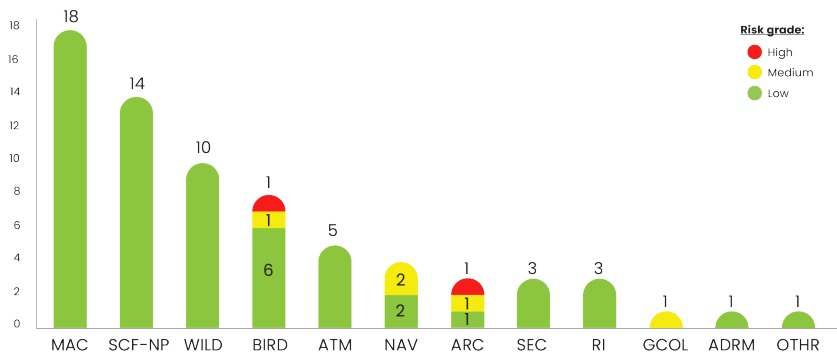


Chart 23: Number of safety occurrences related to general aviation operation in 2025 by ERC score

High-risk occurrence were:

- Hard landing
- Birdstrike with damage

Medium-risk occurrence were:

- Tailstrike
- Taxi clearance deviation
- Pilot error in parking brake setting resulting to a loss of directional control during taxi.
- Bird ingestion

These results show that the most serious safety concerns in 2025 are mainly linked to:

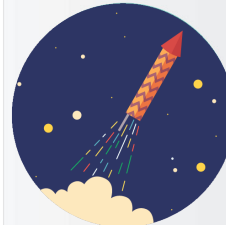
- approach and landing performance,
- Taxi and ground movement control, and
- bird hazard outcomes.

2025 Safety priorities

Based on the 2025 results and the previous five-year trends, the ATO sector should focus on the following areas:

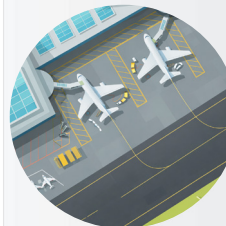
Approach and landing safety should remain a top priority because hard landing and tailstrike were recorded with high/medium risk levels. ATOs should continue strengthening stabilized approach standards, go-around decision discipline, and instructor standardization.

Finally, because skyrocket/firework interference is the highest-volume issue in 2025, it should be managed as a major exposure hazard through operational briefings, hotspot tracking, and coordination with relevant agencies.



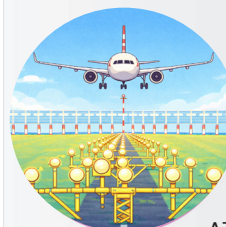
Interference with aircraft by airborne objects

Interference with aircraft by airborne objects are the main external exposure issue for ATO operations in 2025. The most frequently reported events involve skyrocket (Bangfai) and fireworks that are mostly likely to occur in the north eastern part of Thailand. Although all reported cases in 2025 were assessed as Low risk, the hazard has high severity potential. However, these events can also reduce safety margins. As they may distract pilots, reduce effective lookout and visual scanning, increase workload, and require unexpected avoidance actions. This reinforces the importance of flight planning and pre-flight briefing especially when operating in the north eastern regions of Thailand during the Bungfai season.



The presence of taxi clearance deviation

The presence of taxi clearance deviation (medium risk) and loss of directional control during taxi (medium risk) shows that ground operations are still a key risk area in training environments. Taxi requires aircraft handling, correct configuration, route awareness, and accurate communication with ATC. Student pilots may make errors under high workload, and these can quickly lead to unsafe situations. The continued presence of ATM occurrences supports the need to improve communication discipline and clearance compliance, especially at complex aerodromes.



Approach and landing performance

Approach and landing performance continues to be a significant risk for ATOs in 2025

Hard landing (high risk) and tailstrike (medium risk) show that the approach and landing phase remains the most sensitive part of training operations. These events may occur when the approach is not stable, energy is not well controlled, the flare technique is weak, or the go-around decision is delayed. They also highlight the importance of instructor standardization and timely instructor intervention. Taxi, clearance, and ATM interface operational control weakness.

KEY MESSAGE FROM PEL

Personnel Licensing Department

In 2025, the Civil Aviation Authority of Thailand (CAAT), through the Personnel Licensing Department (PEL), continued to strengthen its regulatory role by aligning oversight with standards and emphasizing risk-based strategies in safety oversight. One of the most significant milestones is the transition toward full implementation of the Thailand Civil Aviation Regulations (TCAR PEL).

In this regard, PEL has embarked on a comprehensive recertification program for all Approved Training Organisations (ATOs) to ensure compliance with the regulatory framework and to foster a consistent and sustainable safety culture across the aviation training sector.



To realize the full benefit of these developments, civil aviation organisations and stakeholders are encouraged to deepen their understanding of TCAR and CBTA principles and embed them within their training systems. The effective implementation of these regulations and methodologies will enable Thailand to produce aviation professionals of the highest standard, who are both operationally proficient and internationally recognized.

Following a concerning trend of incidents in student pilot solo flights observed in previous years, PEL took proactive action by developing and issuing the Guidance for First Solo Flight. This document provides guidelines and recommendations for flight instructors to assess pilot trainee for the first solo flight. This initiative has proven effective, as 2025 saw a significant reduction in incidents during solo flight training, particularly hard landings, a notable improvement from previous years.

Further reinforcing this approach, PEL has adopted a risk-based oversight model to guide surveillance planning.

By analyzing data and operator performance, PEL ensures that inspection resources are allocated efficiently and tailored to the specific risk profiles of each ATO. This strategic oversight approach enables more focused interventions and supports continuous improvement in safety outcomes.

In addition, PEL has worked closely with all relevant stakeholders to investigate key safety issues related to safety occurrences, which were identified during flight operations. The outcome was a set of targeted safety recommendations addressing flight training practices, SMS performance, and post-incident monitoring. These efforts reflect the ongoing commitment to data-driven decision-making and cross-functional collaboration. In parallel, PEL has also actively promoted safety awareness under the Thailand Aviation Safety Action Plan. This includes organizing CRM workshops to strengthen skills among aviation personnel, as well as conducting seminars for training organizations and broader stakeholder forums to foster mutual understanding, exchange ideas, and promote a shared safety culture across the industry.

As aviation personnel are a critical factor in aviation safety, regulatory oversight must ensure that all licence holders are not only comply with regulatory requirements but also demonstrably possess and maintain the required competencies essential for safe and effective flight operations.

With a strong regulatory foundation and a clear focus on safety outcomes, PEL remains strong in its mission to uphold aviation safety by ensuring that Thailand's licence holders are competent, accountable, and aligned with global standards, helping to ensure a safe sky for all.

MR. GLOT SANALAKSNA

Manager of Personnel Licensing Department (PEL)



AIR NAVIGATION SERVICE PROVIDER



This section addresses the operational safety issues related to Air Navigation Service Providers (ANSPs) covering all air traffic in Thailand. The rate of safety occurrences related to Air Navigation Services (ANSs) between 2021 – 2025 by occurrence categories is shown in chart 24. The most frequent occurrence categories reported in 2025 were ATM, SEC and MAC.

Occurrence Classification

Rate per 1,000,000 flight movements in BKK FIR

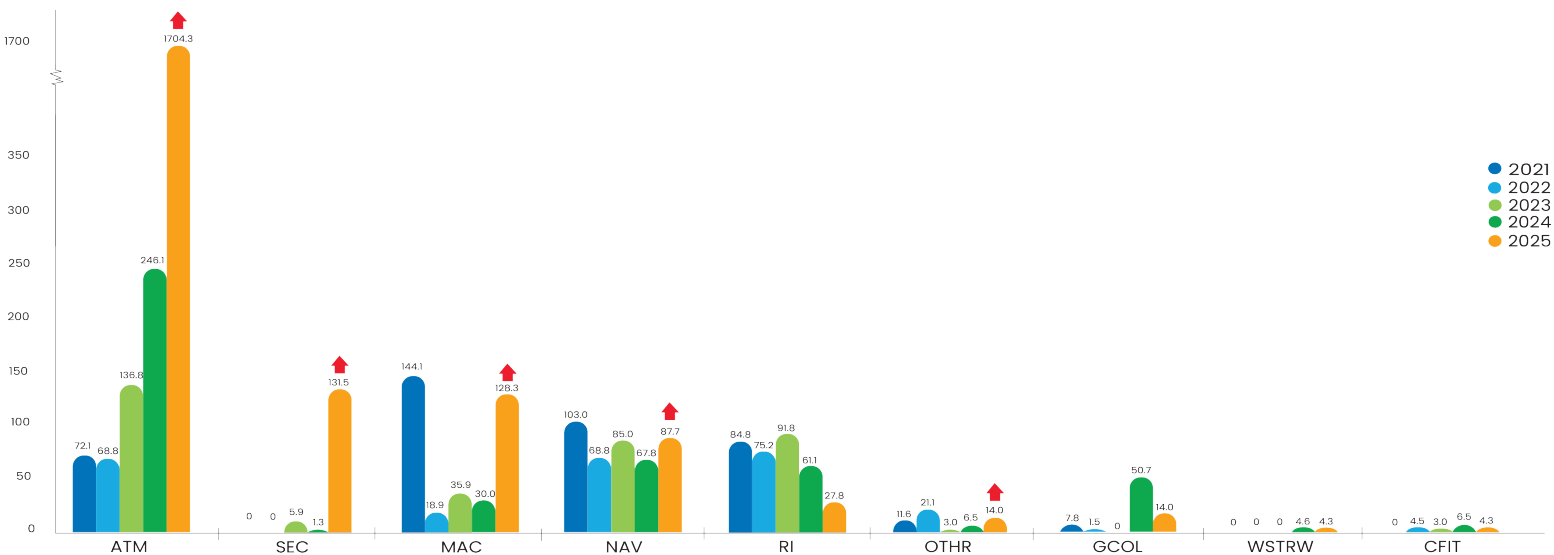


Chart 24: Rate of Occurrence related to approved training organisation from 2021–2025

In 2025, the rate of safety occurrences in the ATM (Air Traffic Management/CNS) category continued to rise significantly, reaching 1,704.34 per 1,000,000 flight movements in the BKK FIR. This surge was primarily driven by the emergence of GNSS Radio Frequency Interference (RFI): jamming and spoofing, which has negatively impacted critical aircraft systems, including Navigation, Ground Proximity Warning Systems (GPWS), and Weather Radar.

The SEC (Security-related) category emerged as the second most frequent occurrence reported in 2025. These incidents were largely characterized by external Interference with Aircraft, specifically involving Lasers, Spotlights, and Fireworks.

The third most frequent occurrence category was MAC (Airprox/Loss of Separation). Key safety issues within this category included TCAS Resolution Advisories (TCAS RA) and incidents of Interference with Aircraft by Rockets (Bangfai), Balloons, and Kites.

Effectively addressing the safety issues within the SEC and MAC categories requires close collaboration between multiple government agencies. Currently, a Subcommittee on Ground-to-Air Hazards Risk Management has been established to monitor progress and define standardized risk management measures. The primary objective of this subcommittee is to prevent hazards to aircraft during flight from ground-based activities, including:

- o The launching of Traditional Rockets (Bangfai).
- o The use of Fireworks, Smoke Lanterns, and Sky Lanterns.
- o Laser Lights or other hazardous conditions.

These initiatives ensure that Thailand's airspace management remains safe, efficient, and fully compliant with current air navigation laws.

However, safety oversight of Air Navigation Services identified instances where mandatory occurrence reports were either incomplete or not submitted to the Civil Aviation Authority of Thailand (CAAT) in accordance with regulatory requirements. The availability of complete and timely safety data remains essential to enhance hazard identification, safety risk assessment, and the effectiveness of mitigation measures for air navigation services.



Key Safety Issues

When the occurrence reports are broken down further by key safety issues, this provides a deeper understanding of the events involved in the reports. The number of key safety issues with the associated ERC scores is shown in Chart 25.

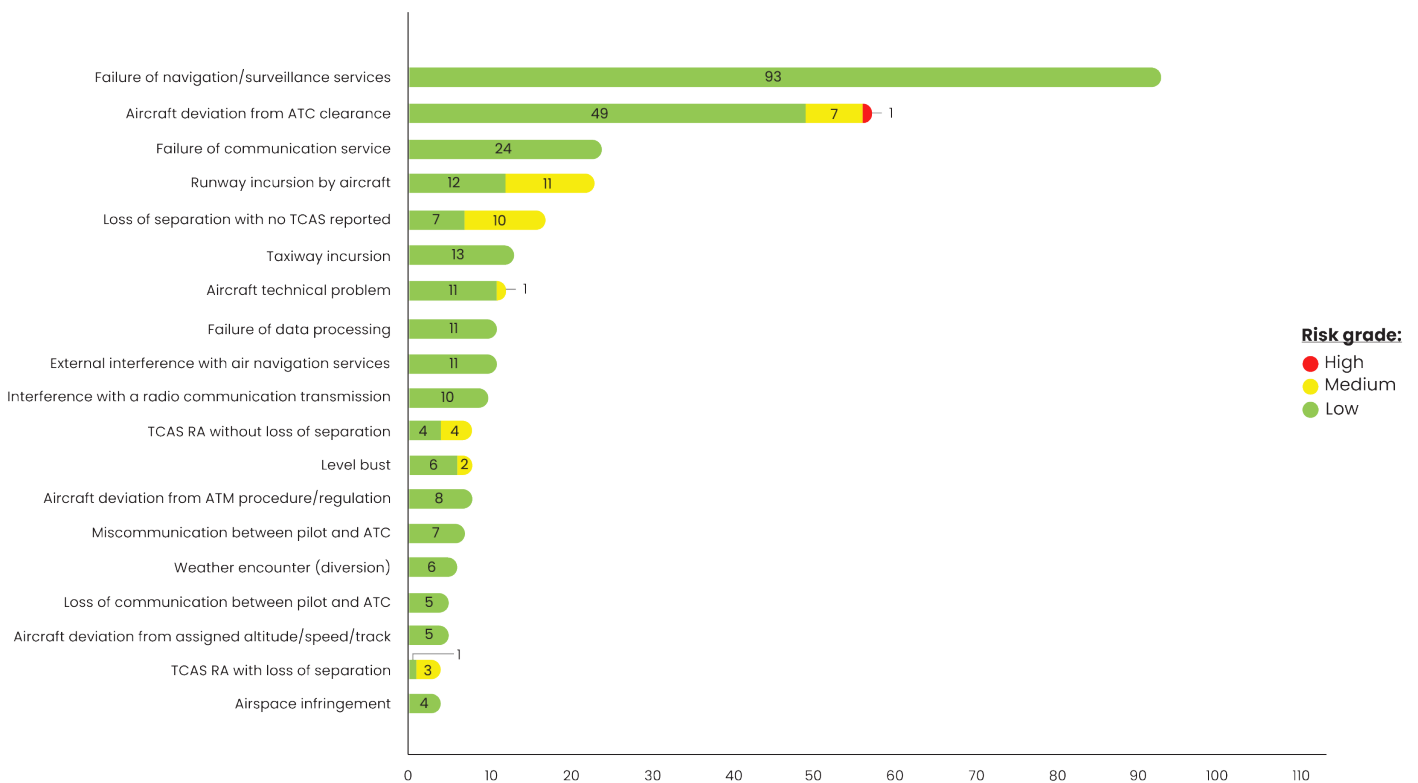
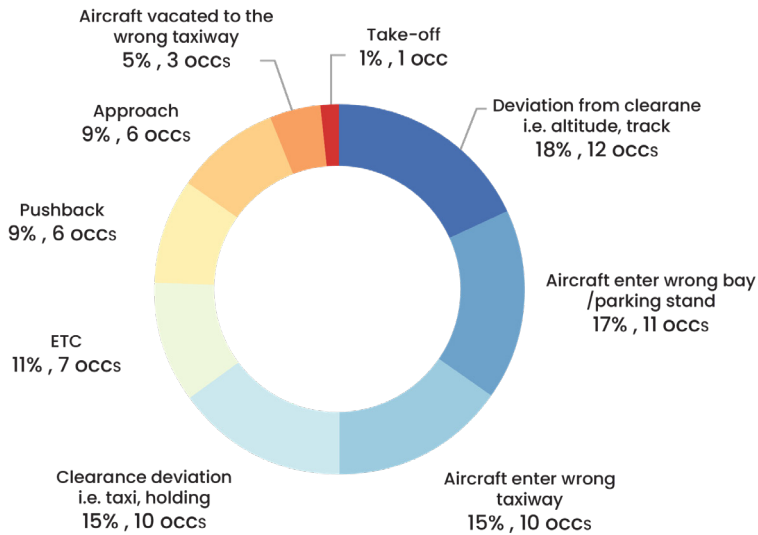


Chart 25: Number of key safety issues of Air Navigation Services in 2025 by ERC score



Aircraft Deviation from ATC Clearance remains one of the most significant safety occurrence categories within air navigation services because deviations involving Altitude, Flight Level, or Track represent a severe risk as they can lead directly to Level Busts or a Loss of Separation between aircraft. In 2025, a total of 66 such incidents were reported, broken down into the following specific event types: Deviation from clearance (Altitude, Flight Level, Track), Aircraft entering wrong bay/parking stand, Aircraft entering wrong taxiway, Clearance deviation – Taxi clearance/holding, Pushback without clearance, Approach deviation, Aircraft vacated to the wrong taxiway, Takeoff without clearance, and others are shown in Chart 26.

Chart 26: Details of aircraft deviation from ATC clearance occurrences

CONTRIBUTING FACTOR:

The analysis of contributing factors reveals distinct patterns for ground and airborne operations:



During the Ground Operations Phase: Incidents often arise from communication between pilots, ground operators, and air traffic controllers. Furthermore, a lack of familiarity with the airport layout frequently results in aircraft taking incorrect taxi routes and failure to maintain a sterile cockpit during taxiing.



During Airborne Operations Phase: Occurrences are primarily driven by the misunderstanding of ATCO instructions during various phases of flight.

PREVENTIVE AND MITIGATION:

To prevent these occurrences from developing into accidents, the following measures are recommended:



Strict Communication Discipline: If there is any doubt or if a received clearance seems incorrect, flight crews and operators must request confirmation and clarify the instruction before execution to prevent errors.



Operational Preparedness: Pilots, ATCO and ground personnel should diligently study Airport Diagrams, Taxi Routes, and relevant aeronautical charts. Thorough pre-operational briefing and situational awareness are essential to prevent errors in flight operations and the misinterpretation of ATC clearances. Flight crew should avoid excessive heads down activity such as FMS programming or checklist programming during taxiing.





Action Implementation at the National Level related to Key Safety Issues:

At the national level, Air Navigation Services (ANS) has implemented targeted actions focusing on safety management, regulatory oversight, and systemic risk reduction related to key safety issues involving Air Navigation Services.

KEY MESSAGE FROM ANS

Air Navigation Service Standards Department

Global Navigation Satellite System (GNSS) Radio Frequency Interference (RFI):



GNSS RFI-related events have received increased attention globally. In response, ANS has accorded high priority to this issue through continuous monitoring and the systematic collection and analysis of GNSS RFI occurrence data.

- **Relations:** Awareness-raising initiatives, stakeholder engagement, and information sharing at both national and international levels.
- **Regulate:** Enforcement of applicable laws and regulations through inspections, investigations, and legal actions against offenders to ensure compliance and safeguard aviation navigation safety.

ANS has addressed GNSS RFI through an integrated Reduction, Relations, and Regulate approach:

- **Reduction:** Measures aimed at limiting the availability and use of GNSS jammers through coordination with online platforms and relevant authorities.

Going forward, enhancements to the occurrence reporting framework are planned to improve the effectiveness and efficiency of safety data management, analysis, and risk-based decision-making.

Runway Incursion:

As runway incursion occurrences involve multiple key civil aviation stakeholders, including aerodrome operators, air operators, and air navigation service providers, a coordinated and collaborative risk management approach has been emphasized through the **National Runway Safety Committee** established by CAAT. In addition, regular ANS safety oversight activities have placed a strategic emphasis on the refinement of coordination procedures and the formalization of Letters of Agreement (LoA) between Air Traffic Services Providers and aerodrome operators. This focus underscores the critical significance of mitigating runway incursion risks and ensuring that operational interfaces are clearly defined to maintain the highest standards of aerodrome safety.

Other risk management measures include:

- The amendment of relevant regulations, such as the **CAAT Regulation on the Establishment of Coordination Agreements between Air Traffic Control Units and Aerodrome Operators B.E. 2568**
- The development and implementation of harmonized new operational procedures
- The adoption of advanced enabling technologies to support Air Navigation Services

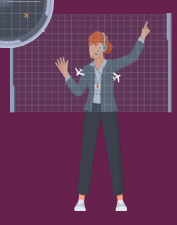
These measures aim to mitigate runway safety risks and reduce the likelihood of recurrence.



Failure of Communications, Navigation and Surveillance Services (CNS):



In 2025, CAAT, in its role as the ANS regulator, conducted focused safety occurrence reporting activities for AEROTHAI CNS services. These activities aimed to:



- Promote a common understanding of CNS safety occurrence reporting requirements
- Enhance reporting efficiency among CNS service providers
- Improve the quality, completeness, and accuracy of safety reports to support meaningful safety analysis



In addition, CAAT facilitated technical and operational discussions to identify operational issues, constraints, and challenges, enabling the exchange of perspectives and the development of appropriate improvement measures. Executive-level management meetings were also conducted to address key safety issues and verify the effectiveness of corrective and preventive actions.

Interference with Aircraft from Ground to Airborne Aircraft

Such events have been continuously addressed through risk management processes implemented by the National Risk Management of Hazards from Ground to Airborne Aircraft Sub-Committee established by CAAT, with participation from relevant organizations, including the Department of Provincial Administration, AEROTHAI, the Airspace Management Cell – Thailand, and law enforcement authorities.

These efforts include:

- The development of supporting regulations and operational procedures to be jointly implemented among all participating organizations
- The conduct of safety promotion activities, including public education and awareness on applicable regulations and operational procedures



Furthermore, Airspace Management (ASM), Air Traffic Flow Management (ATFM) and Air Traffic Services (ATS) has focused on the development of operational procedures to reduce the likelihood of safety-related occurrences arising from Ground to airborne aircraft. Particular emphasis has been placed on process-based coordination and collaborative discussions on practical operational measures to support effective implementation, as well as on timely communication with relevant stakeholders, in order to mitigate potential impacts on the safety of flight operations.

The objective of these actions is to reduce the likelihood and trends of aircraft interference occurrences that may adversely affect aviation safety in the future.

AERODROME OPERATION



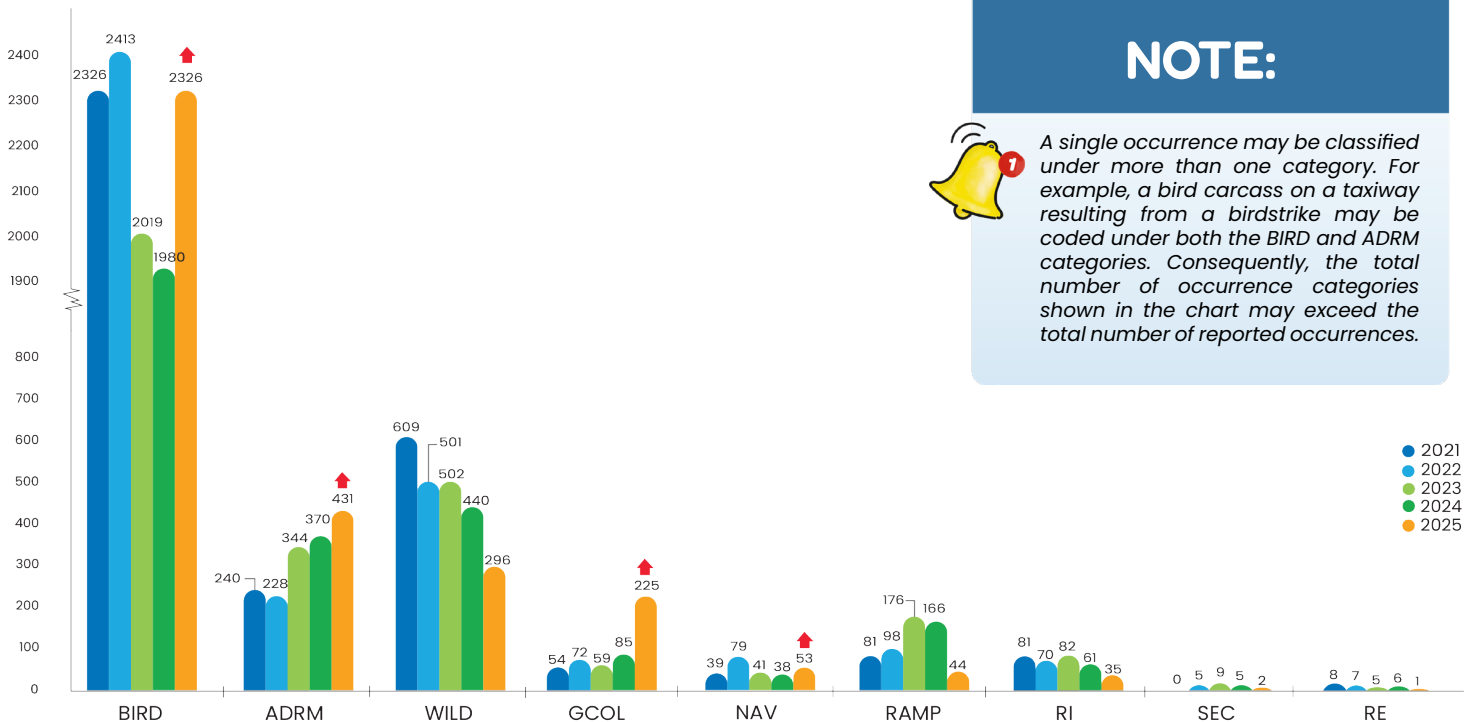
This section addresses operational safety issues related to Thailand public aerodrome and operations. The analysis is based on safety occurrence reports submitted to CAAT by various civil aviation organisations. To provide an overview, this section highlights occurrences related to bird and wildlife hazards, events occurring within aerodrome movement areas and facilities, and airside driving-related occurrences. While these occurrences are primarily categorised under aerodrome operations, some events may also involve aspects of air operations and/or air traffic management. These occurrences are included where they have a direct or indirect impact on aerodrome operations.

Chart 27 presents the distribution of safety occurrence rates per 1 million flight by occurrence category for the period 2021–2025. As shown in the chart, the five occurrence categories with the highest rates are birdstrike (BIRD), aerodrome-related occurrences (ADRM), wildlife collision (WILD), ground collision (GCOL), and navigation error (NAV). Notably, the rate of GCOL occurrences increased significantly in 2025, at approximately 2.65 times the level recorded in 2024. In contrast, the WILD, RAMP, and RI categories show notable reductions compared to 2024.

While the chart includes all reported occurrence categories, this section focuses on further analysis of the four categories most relevant to aerodrome operations, namely BIRD, WILD, ADRM, and GCOL.

Occurrence Classification

Rate per 1,000,000 flight movements

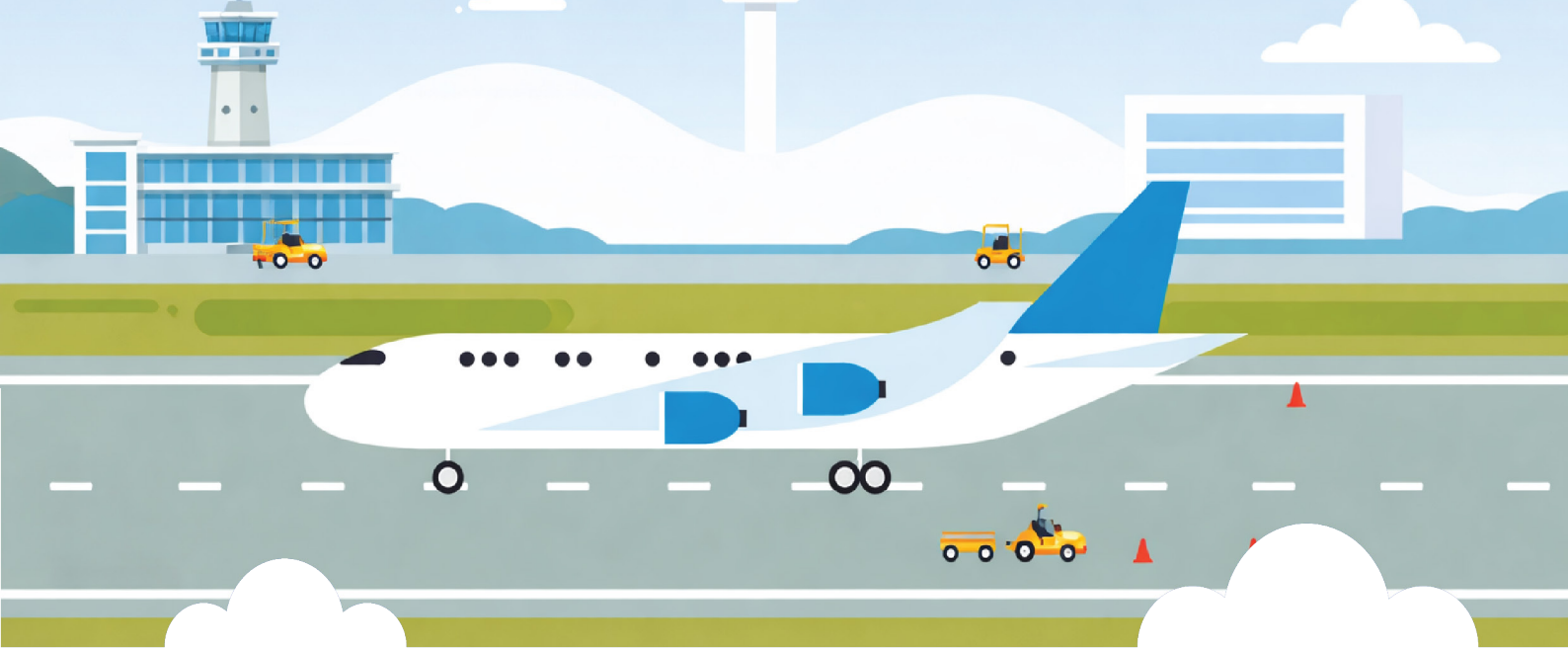


NOTE:



A single occurrence may be classified under more than one category. For example, a bird carcass on a taxiway resulting from a birdstrike may be coded under both the BIRD and ADRM categories. Consequently, the total number of occurrence categories shown in the chart may exceed the total number of reported occurrences.

Chart 27: Rate of safety occurrences related to aerodrome operation in 2021 - 2025

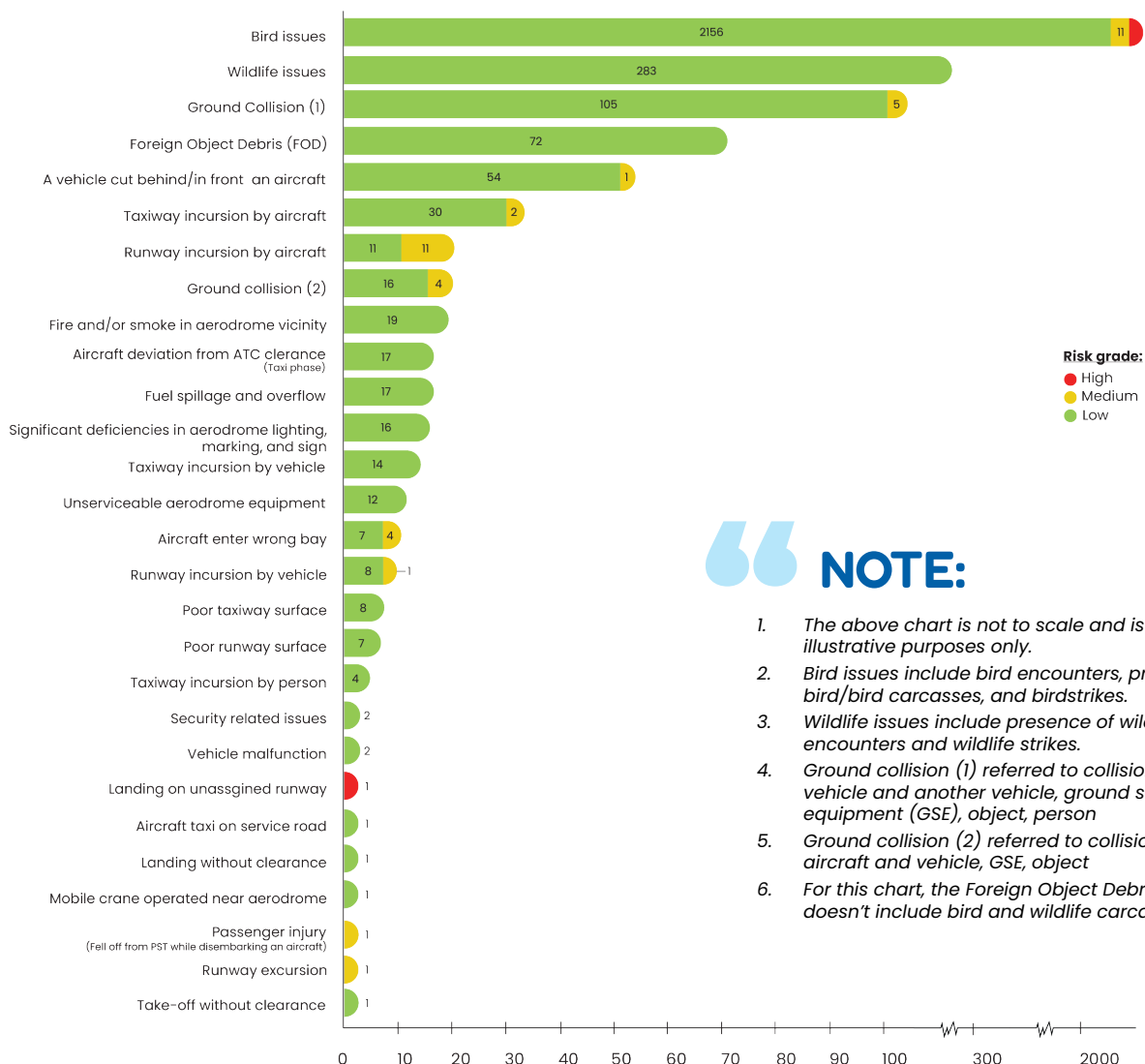


Key Safety Issues

To provide additional context, safety occurrence reports were analysed and organised by key safety issues representing the underlying nature of the occurrences, such as taxiway incursions, Foreign Object Debris (FOD), and aerodrome signage deficiencies. Each key safety issue is further broken down by the associated risk grade (ERC score), as presented in Chart 28.

In total, 2,908 aerodrome operation-related safety occurrences were recorded in Thailand in 2025. To further emphasise the key safety issues associated with medium to high risk, Chart 29 presents only those key safety issues assessed as medium to high risk.

Readers are encouraged to refer to both charts in order to gain a comprehensive understanding of the current aerodrome safety issues and the level of risk each key safety issue poses to aerodrome operations.



NOTE:

1. The above chart is not to scale and is provided for illustrative purposes only.
2. Bird issues include bird encounters, presence of bird/bird carcasses, and birdstrikes.
3. Wildlife issues include presence of wildlife, wildlife encounters and wildlife strikes.
4. Ground collision (1) referred to collision between vehicle and another vehicle, ground service equipment (GSE), object, person
5. Ground collision (2) referred to collision between aircraft and vehicle, GSE, object
6. For this chart, the Foreign Object Debris (FOD) doesn't include bird and wildlife carcasses.

Chart 28: Number of key safety issues related to aerodrome operation in 2025

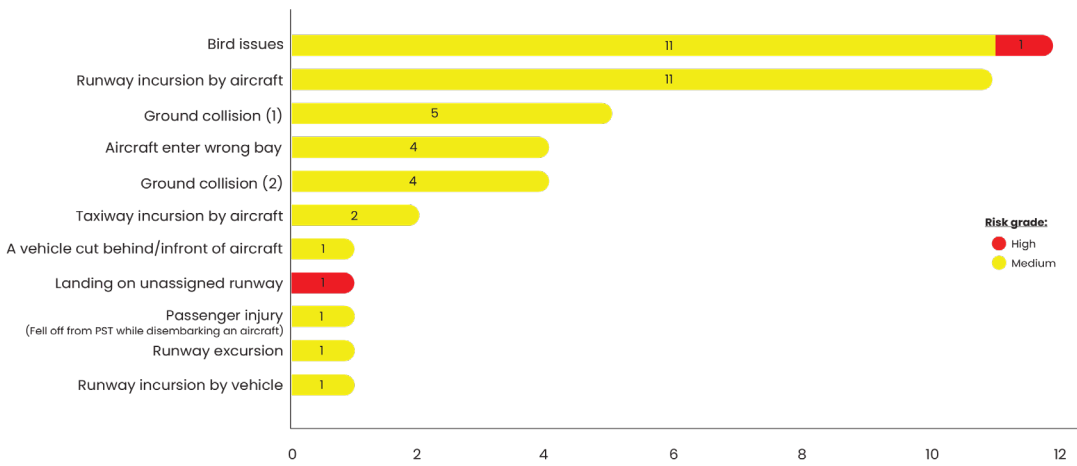


Chart 29: Number of medium-high risk key safety issues related to aerodrome operation in 2025

As can be seen from Chart 29, Bird and wildlife issues continue to be among the most frequently reported occurrence categories. However, the associated risk grades indicate that the consequences of these occurrences are predominantly low, with approximately 0.55% of bird-related occurrences assessed as medium to high risk. In contrast, occurrences such as runway incursions involving aircraft or vehicles, runway excursions, and aircraft landings on an unassigned runway are reported less frequently but are more often associated with higher risk grades, reflecting the potentially more severe consequences of these events.

In this context, this information supports safety practitioners in adopting a balanced approach to safety management, taking into account both high-frequency, lower-severity occurrences and lower-frequency events that represent a higher proportion of medium to high risk outcomes.

In addition, other high-frequency key safety issues include collisions involving vehicles, ground service equipment (GSE), objects, or persons, as well as foreign object debris (FOD) occurrences. Further analysis of key safety issues including bird, wildlife issue, and FOD is presented in the following section.

Bird and wildlife issues

Bird and wildlife issues continue to be reported at aerodromes in Thailand. The country's geographical and environmental characteristics, including a tropical climate and diverse ecosystems, support a wide range of bird species, including migratory birds, as well as other wildlife that may be present within or in the vicinity of aerodromes. These conditions may influence the exposure of aircraft operations to bird- and wildlife-related hazards.

The presence and activity of birds and wildlife in and around aerodromes may vary depending on multiple factors, which can differ between locations and over time. Such factors include, but are not limited to:

- local habitat characteristics, including vegetation type and water sources;
- seasonal and migratory movement patterns of bird species;
- land use in the vicinity of aerodromes, including landfill sites, waste disposal areas, and food sources that may attract wildlife;

- agricultural activities near aerodromes, such as crop cultivation and livestock farming;
- aerodrome drainage systems, ponds, or standing water that may attract birds;
- the condition and effectiveness of perimeter fencing and other physical barriers controlling wildlife access to airside areas;
- joint-use aerodrome operations involving civil and military activities, which may influence movement patterns and habitat disturbance;
- ongoing construction or development activities at or near aerodromes that may alter habitats or temporarily attract wildlife; and
- changes in operational factors, such as aircraft movement patterns and flight schedules, which may affect the likelihood of wildlife encounters.



NOTE:

1. Bird issues include bird encounters and birdstrikes.
2. Wildlife issues include wildlife encounters and wildlife strikes.

The following charts present further information on bird issues, including: (1) Monthly distribution of bird issues in 2025; and (2) Top ten aerodromes with the highest rates of bird issues that affected flight operations in 2025.

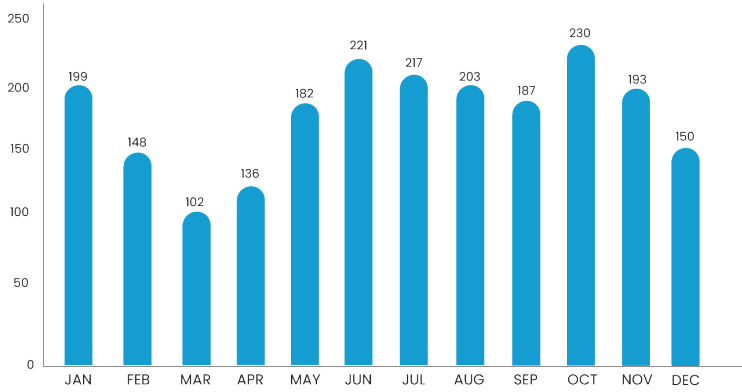


Chart 30: Monthly distribution of bird issues in 2025 (count of events)

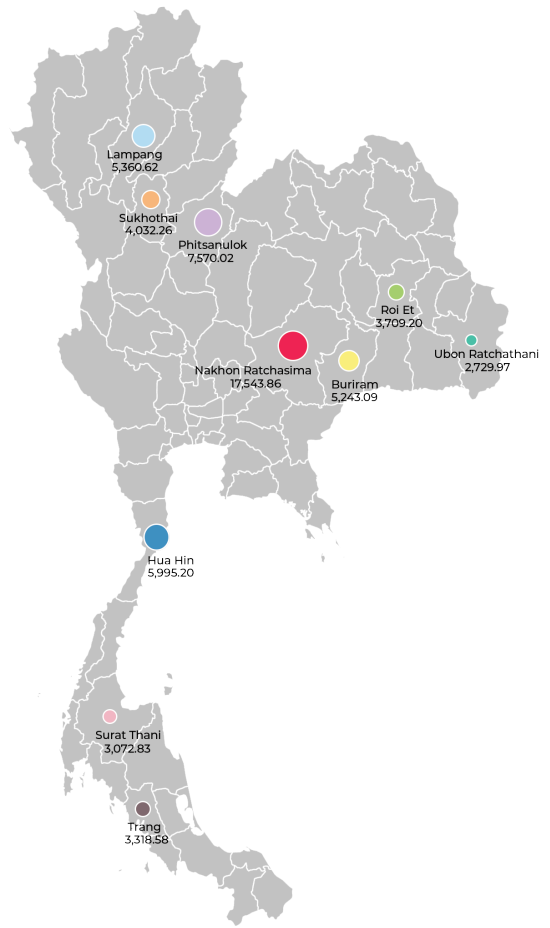
From Chart 30, it can be observed that the rate of bird issues has generally increased from May until the end of the year. A similar pattern was also observed in previous years. Awareness of this seasonal pattern may assist operators in managing bird strike risk throughout different periods of the year.

**Rate per 1 million flight movements*

ICAO code	Airport	2025
VTUQ	Nakhon Ratchasima Airport	17,543.86
VTPP	Phitsanulok Airport	7,570.02
VTPH	Hua Hin Airport	5,995.20
VTCL	Lampang Airport	5,360.62
VTUO	Buriram Airport	5,243.09
VTPO	Sukhothai Airport	4,032.26
VTUV	Roi Et Airport	3,709.20
VTST	Trang Airport	3,318.58
VTSB	Surat Thani Airport	3,072.83
VTUU	Ubon Ratchathani Airport	2,729.97

Table 1: Top ten aerodromes with the highest rates of bird issues that affected flight operations in 2025.

From Table 1, VTUQ records the highest rate of bird strikes in 2025. Notably, the aerodrome did not appear among the top ten in 2024. As bird strikes present a risk to flight operations, operators conducting activities in the vicinity of VTUQ aerodrome should take this information into consideration.



Focusing specifically on birdstrike occurrences, a total of 1,626 birdstrike reports were recorded, of which 57 cases resulted in aircraft damage, representing approximately 3.51% of all birdstrike occurrences. While only a small proportion of birdstrike events result in aircraft damage, analysing the characteristics of those that do provides additional context for safety analysis. Accordingly, the following table presents the distribution of birdstrike occurrences with reported damage by bird size and number of birds involved.

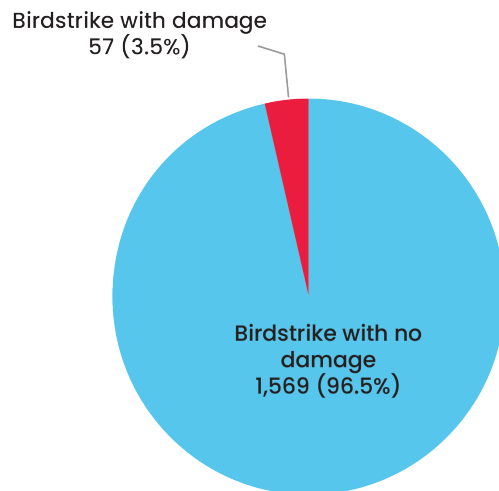


Chart 31: Pie chart indicates the proportion of birdstrike with damage vs without damage events

Size of bird VS. Number of bird strikes	Small size	Medium size	Large size	unknown	Total
1 bird	19.30%	7.02%	12.28%	3.51%	42.11%
2-10 birds	0.00%	0.00%	3.51%	0.00%	3.51%
Unknown	5.26%	3.51%	1.75%	43.86%	54.39%
Total	24.56%	10.53%	17.54%	47.37%	100.00%

Table 2: The distribution of birdstrike occurrences with reported damage by bird size and number of birds involved

Note: Values are expressed as a percentage of birdstrike occurrences with reported damage by size and number relative to the total number of birdstrike with damage occurrences (grand total).

The analysis indicates that nearly half of damaging birdstrike occurrences involve unknown bird size, with a substantial proportion also lacking information on the number of birds struck. Among cases with known data, single-bird strikes are the most common, with small birds representing the highest proportion among known size categories, followed by large birds. The high level of unknown data highlights the need to improve reporting completeness in order to enhance safety intelligence and support more targeted wildlife hazard mitigation.

Next, the following charts present further information related to wildlife issues, including: (1) Top ten aerodromes with the highest rates of wildlife issues that affected flight operations in 2025. ; and (2) wildlife issues categorised by species.

*Rate per 1 million flight movements

ICAO code	Airport	2025
VTCP	Phrae Airport	200,000.00
VTPB	Phetchabun Airport	76,923.08
VTPH	Hua Hin Airport	7,194.24
VTSY	Yala (Betong) International Airport	5,102.04
VTUV	Roi Et Airport	4,080.12
VTUU	Ubon Ratchathani Airport	3,442.14
VTUO	Buriram Airport	2,383.22
VTSR	Ranong Airport	2,152.85
VTPP	Phitsanulok Airport	1,514.00
VTSE	Chumphon Airport	1,426.53

Table 3: Top ten aerodromes with the highest rates of wildlife issues that affected flight operations in 2025.

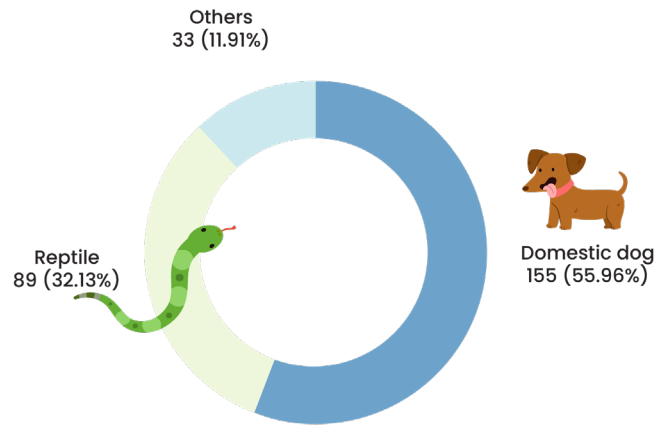


Chart 32: Pie chart representing count of wildlife issues categorised by species.

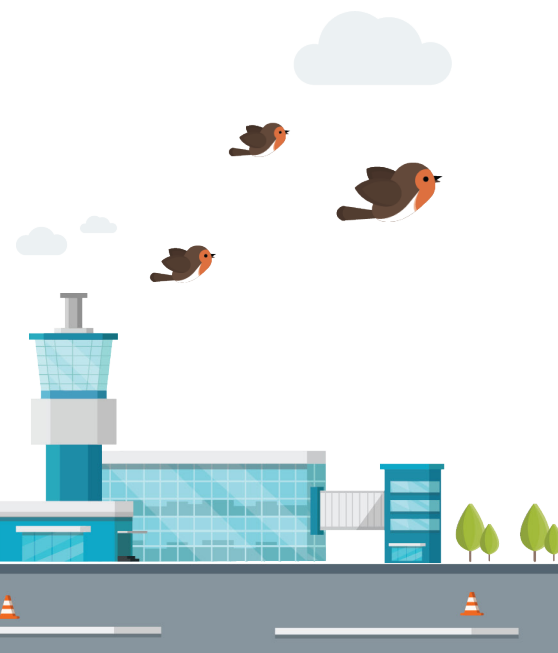
Chart 32 indicates that 55.96% of wildlife issues were related to domestic dogs, while 32.13% were associated with reptiles. By implementing preventive measures targeting these two species, aerodrome operators could potentially mitigate the majority of wildlife-related risks, accounting for nearly 90% of the reported wildlife issues. Mitigation effort in Thailand



Aerodrome wildlife hazard management programmes include a range of mitigation strategies implemented by bird control personnel and supported by relevant stakeholders. These measures include the use of bird deterrents, such as acoustic and visual devices, as well as habitat management practices, including maintaining grass at specified heights and reducing water sources within airside areas to discourage bird activity. In addition, bird control personnel are trained to routinely monitor bird and wildlife activity and to take timely action when an increased strike risk is identified.

To further strengthen wildlife hazard management, CAAT, in collaboration with multiple agencies, has established the National Wildlife Hazard Management Subcommittee. This initiative aims to enhance coordination and improve the effectiveness of bird and wildlife risk management at the national level. Further details are provided in the Key Messages from the Aerodrome Standards Department (AGA) session.

With continued collaboration and coordinated efforts, bird and wildlife hazard management in Thailand is expected to continue improving in support of enhanced operational safety.



Foreign Object Debris (FOD)

The presence of foreign object debris (FOD) within aerodrome movement areas may pose risks to aircraft operations and may also result in injury to personnel. Mitigation of FOD hazards requires coordination among aerodrome operators, ground handling service providers, maintenance personnel, and other relevant stakeholders to support routine inspection and removal of debris from airside areas.

Further analysis indicates that, out of 356 occurrences in which Foreign Object Debris (FOD) was observed in 2025 (including bird and wildlife carcasses), 282 occurrences were related to bird and wildlife carcasses observed at aerodromes. This represents approximately 79% of all reported FOD occurrences in 2025.

The remaining 72 occurrences (approximately 21%) were related to other FOD sources, including poor surface conditions, material debris, and devices or tools left in operational areas.

In 2025, these included 17 cases of rubber joint FOD, 10 cases of asphalt debris, and 8 cases involving devices or tools left in operational areas. Other reported items included objects such as balloons, plastic bags, traffic cones, and other miscellaneous objects.



NEW EMERGING RISKS

UNAUTHORIZED DRONE OPERATIONS IN THE VICINITY OF AERODROMES

In 2025, risks associated with unauthorized drone activity in the vicinity of Thai commercial airports have developed into an increasingly complex challenge.

CAAT emphasizes that the presence of drones, within or near a certified aerodrome without prior authorization constitutes a high-level security and safety threat. Unauthorized drone operations may lead to serious incidents, including the risk of collision with aircraft, disruption of air navigation services, damage to aerodrome infrastructure, or harm to passengers and personnel.

Aerodrome operators are strongly encouraged to remain vigilant and to implement appropriate safety measures to identify and mitigate the risks and determine appropriate response to unauthorized drone activities in a timely and effective manner.

CAAT and relevant authorities are currently undertaking the development of safety measures to enhance the safety and security standards in order to mitigate these risks.



RUNWAY SAFETY OCCURRENCE

This section presents statistical information on runway safety-related occurrences, including runway incursions, runway excursions, and other runway and movement area safety occurrences that may pose risks to the safe operation of aircraft and to personnel operating on or near runways.

In accordance with the Global Aviation Safety Plan (GASP), runway safety-related occurrences encompass the following occurrence categories:

- Abnormal runway contact;
- Bird strike;
- Ground collision;
- Runway excursion;
- Runway incursion;
- Loss of control on the ground;
- Collision with obstacle(s);
- Undershoot / overshoot; and
- Aerodrome-related occurrences.

Based on safety analysis conducted in line with the GASP and the Thailand Aviation Safety Action Plan (TASAP), runway excursions and runway incursions were identified as the primary high-risk runway safety occurrence categories in Thailand.

In this section, further detail is provided on runway safety occurrence categories relevant to Thailand that have not yet been discussed in previous sections, with particular focus on Runway Incursion (RI) and Runway Excursion (RE).

Runway Incursions (RI)

If we refer to Chart 27, the rate of RI occurrences has been gradually decreasing since 2023. Nevertheless, RI remains a significant runway safety risk, as it may lead to ground collision accidents and serious incidents involving aircraft, vehicles, or persons, with the potential to cause serious injuries or multiple fatalities.

In 2025, a total of 33 RI occurrences were reported in Thailand. Chart 33: Count of Runway Incursion Occurrences by Event Type and Risk Grade (2025) presents a breakdown of these occurrences by common event type, grouped according to associated risk grade.

In addition, Chart 34 illustrates the proportion of Operational Consequences resulting from Runway Incursion Occurrences, providing further insight into the operational impact and severity of these events.

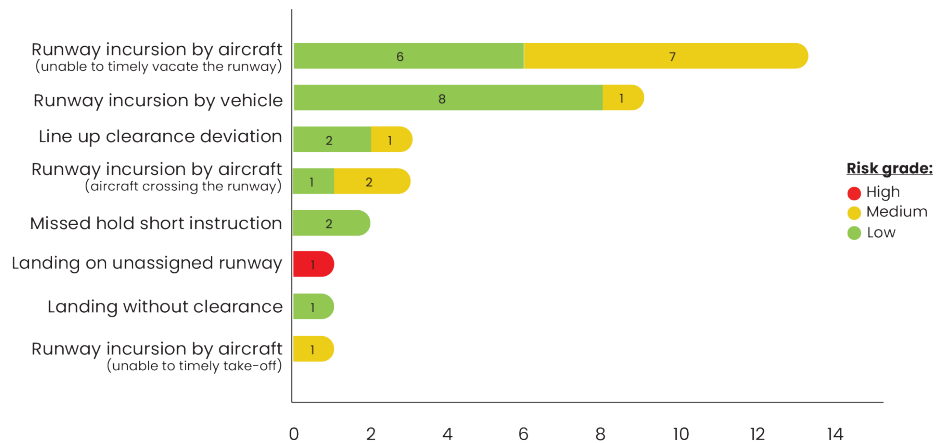


Chart 33: Count of Runway Incursion Occurrences by Event Type and Risk Grade (2025)

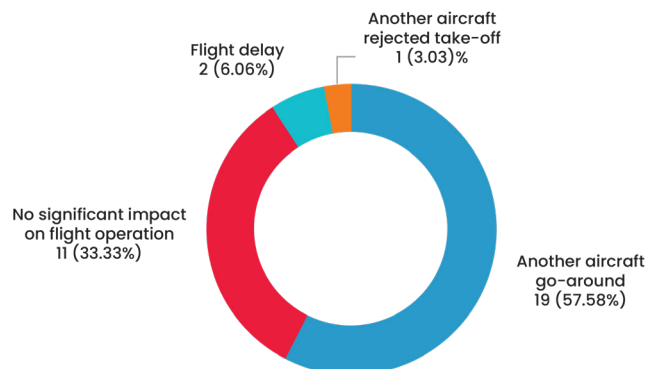


Chart 34: Breakdown of Operational Consequences resulting from Runway Incursion Occurrences (2025)

Runway incursions may arise from a wide range of contributing factors, including, but not limited to:

- Misunderstanding of ATC instructions or miscommunication between pilots, air traffic controllers, and ground personnel;
- Inadequate situational awareness or failure to adhere to standard operating procedures by pilots or ground personnel;
- High workload conditions;
- Failure to vacate the runway due to aircraft or ground vehicle malfunction;
- ATC challenges in maintaining appropriate separation, particularly during busy periods, including situations where the preceding aircraft is unable to vacate the runway in a timely manner, leading to go-around events;
- Prolonged runway occupancy time;
- Unfamiliarity with, or complexity of, the aerodrome layout;
- Adverse meteorological conditions, including low visibility;
- Suboptimal air traffic management practices; and
- Inadequate or insufficient training for air traffic controllers, pilots, and/or airside vehicle drivers.

The mitigation of runway incursion risks requires coordinated and collaborative efforts among multiple stakeholders, including air operators, air navigation service providers, and aerodrome operators. In general, risk reduction may be supported through measures such as effective communication practices, adherence to standard operating procedures, continuous enhancement of situational awareness, regular and appropriate training, and the provision and maintenance of clear and standardized runway and taxiway signage and markings



Runway Excursions (RE)

RE remain a significant safety concern due to their potential severity; however, in 2025, the number of reported RE occurrences at Thailand public aerodromes decreased to 1 event compared to last year (5 events).

The single RE occurrence in 2025 involved an aircraft striking a runway edge light during take-off. Although the frequency of runway excursion occurrences was low in 2025, the potential consequences of such events remain high. Continued focus is therefore required at both the operational and State levels.

At the operational level, adherence to standard operating procedures (SOPs), effective aircraft handling, and heightened awareness of runway environment and lateral margins during take-off and landing operations support the prevention of runway excursion events. At the State level, continued collaboration between CAAT and industry through the National Runway Safety Programme, including monitoring of runway excursion trends and targeted safety actions, supports the ongoing reduction of RE risk and the enhancement of runway safety across Thailand aerodromes.

MITIGATION EFFORT IN THAILAND

Thailand continues to strengthen runway safety through the implementation of the National Runway Safety Programme under the oversight of the National Runway Safety Subcommittee (NRSSC). Key mitigation measures include the application of the National Runway Safety Plan, based on national safety data and international best practices, as well as the establishment of Local Runway Safety Teams (LRST) at aerodromes to support local hazard identification and risk mitigation. In addition, the Aviation Safety Focus Group (ASFG), formerly the Operational Task Force, serves as a collaborative forum for civil aviation organizations (CAOs) to discuss a wide range of safety concerns, including runway safety, and to share safety issues and perspectives at the national level. Further details on NRSSC- and LRST-related initiatives are provided in the Aerodrome Standards Department (AGA) session.



KEY MESSAGE FROM AGA

Aerodrome Standards Department

Throughout 2025, CAAT continued to address priority safety risk areas to support the sustained improvement of aviation safety performance at the national level. The Wildlife Hazard Management Task Force (WHM TF) remained operational, with further progress achieved in Runway Safety and Safety Oversight, as outlined below.

WILDLIFE HAZARD MANAGEMENT:

Building on the work of the WHM TF, CAAT established a National Wildlife Hazard Management Subcommittee to formalize a coordinated multi-agency mechanism for wildlife hazard risk management. This framework extends beyond the aviation sector to include relevant State authorities, notably the Department of Public Works and Town & Country Planning and the Department of National Parks, Wildlife and Plant Conservation. Through structured coordination and technical consultation, participating agencies have aligned land-use planning considerations and wildlife control measures with aviation safety requirements.

In 2026, CAAT intends to promulgate advisory material to enhance awareness of bird species prevalent in Thailand and their associated operational risks. This measure is aimed at promoting more systematic wildlife hazard reporting among aviation stakeholders and strengthening national wildlife hazard data collection and analytical processes, in line with risk-based safety management principles.

RUNWAY SAFETY:

The National Runway Safety Subcommittee (NRSSC) continued to oversee the implementation of the National Runway Safety Programme as a key mechanism to mitigate runway safety risks. The programme is implemented in accordance with the National Runway Safety Plan, developed on the basis of national safety data analysis and relevant international best practices. The Plan incorporates applicable elements of the Global Action Plan, adapted to the national operational context.

A significant regulatory measure was introduced through the requirement for aerodrome operators to establish the Local Runway Safety Team (LRST). This requirement supports the effective implementation of runway safety initiatives at the operational level and strengthens local hazard identification and risk mitigation processes. CAAT will continue to monitor implementation in accordance with the established national roadmap.

SAFETY OVERSIGHT:

Aerodrome Certification remains a priority to ensure the continued compliance of Thai aerodromes with national regulatory requirements and applicable international standards. In parallel, CAAT has further enhanced its Surveillance system through the application of a structured, Risk-Based Oversight methodology within the AGA domain. This approach enables the prioritization of oversight activities based on safety risk profiles and supports the effective allocation of oversight resources, thereby improving the overall effectiveness of safety oversight activities.



GP. CAPT. SUCHAT ANGTHONG
Manager of Aerodrome Standards Department (AGA)

KEY MESSAGE FROM UAS

Unmanned Aircraft Standards Department

ENHANCING THE REGULATORY OVERSIGHT OF UNMANNED AIRCRAFT AND ADVANCED AIR MOBILITY



The Unmanned Aircraft Standards Division of the Civil Aviation Authority of Thailand (CAAT) is responsible for regulating the operation of unmanned aircraft to ensure aviation safety in accordance with established safety standards, amid continuous advancements in aviation technology and evolving operational use cases. At present, the use of unmanned aircraft has expanded from basic applications to more complex operational models, such as cargo delivery and operations in urban environments, as well as emerging concepts under Advanced Air Mobility (AAM), including electric Vertical Take-off and Landing (eVTOL) aircraft. These developments are expected to influence the future of national transportation systems and introduce operational characteristics and risk profiles that differ significantly from those of conventional aviation.

In response to these changes, CAAT recognizes the need to adjust and enhance the regulatory framework for unmanned aircraft to adopt a more system-wide approach, enabling effective management of risks associated with new and evolving operational models. Accordingly, regulatory oversight is no longer limited solely to aircraft standards, but extends to operational concepts, operational environments, remote pilots, and overall safety oversight, ensuring alignment with the increasing complexity of unmanned aircraft operations.

Within this framework, CAAT has developed and continuously refined its regulatory approaches to address the evolving operational landscape. This includes the establishment of aircraft standards, training standards, qualification and competency requirements for remote pilots, and licensing systems, under a legal framework aligned with international best practices. In parallel, CAAT has implemented supporting systems as part of the unmanned aircraft ecosystem, including the Unmanned Aircraft Operation Authorization System (UAS Portal Tracking). Building this foundation, the next stage will advance the Unmanned Aircraft System Traffic Management (UTM), and the Remote Identification (Remote ID) system. These tools are intended to enhance regulatory oversight, monitoring, and control of unmanned aircraft operations in an appropriate and effective manner.

Such an approach forms a fundamental basis for the current oversight of unmanned aircraft and supports preparedness for future operational developments, while maintaining aviation safety as a core principle of the civil aviation system. In this regard, regulatory readiness for Advanced Air Mobility and eVTOL operations is of particular importance, as these aircraft represent new forms of aviation with complex operational characteristics that require clear and appropriate safety frameworks.

Consistent with regional cooperation efforts, CAAT has actively participated with aviation authorities from various countries in the development of joint reference materials for the regulation of AAM and eVTOL operations, supporting the establishment of harmonized and safe regulatory frameworks across the Asia-Pacific region. In addition, Thailand is currently preparing to host the ICAO Advanced Air Mobility Symposium in 2026, which will serve as a platform for the exchange of knowledge and regulatory approaches related to new aviation technologies, while continuing to place primary emphasis on the safety of the civil aviation system.



MR. CHATCHAI PUNTRAGUL

Manager of Unmanned Aircraft Standards Department (UAS)

STATE AIRCRAFT



State aircraft operations have missions that differ from those of civil aviation; however, both share the common objective of ensuring the safety of the public and passengers. Furthermore, to ensure safety within shared civil-military airspace and to effectively manage national civil aviation safety, cooperation among all relevant sectors is essential.

In Thailand, the National Civil Aviation Safety Board (NCASB) serves as a forum for information sharing and the discussion of national safety issues among relevant agencies. The board includes senior representatives from the Royal Thai Air Force (RTAF), Royal Thai Army (RTA), Royal Thai Navy (RTN), and the Royal Thai Police (RTP) Aviation Division. Their presence ensures that military operational requirements and civil safety standards are harmonised.

Although State aircraft operations are not required to report safety occurrences to the Civil Aviation Authority of Thailand (CAAT) under the CAAT Regulation No. 22, CAAT remains responsible for addressing safety issues that may affect civil aviation. Accordingly, the safety issues involving State aircraft operations addressed in this section are based on occurrence reports submitted by civil aviation organizations. Chart 35 reveal an increasing in the number of occurrences related to State aircraft operation reported to CAAT. In 2025, there has been approximately 13 % increase in occurrences related to State aircraft. Chart 36 shows the most frequent occurrence categories reported in 2025 were SCF-NP, MAC and BIRD.

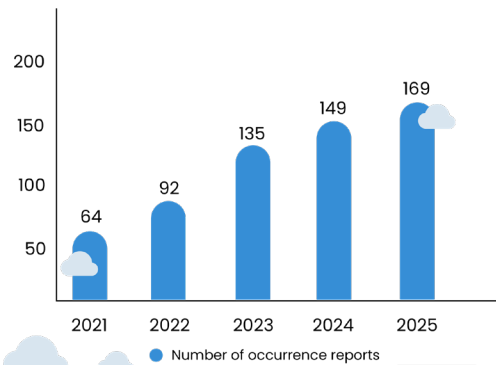


Chart 35: Number of occurrences reports related to State aircraft operations from 2021-2025

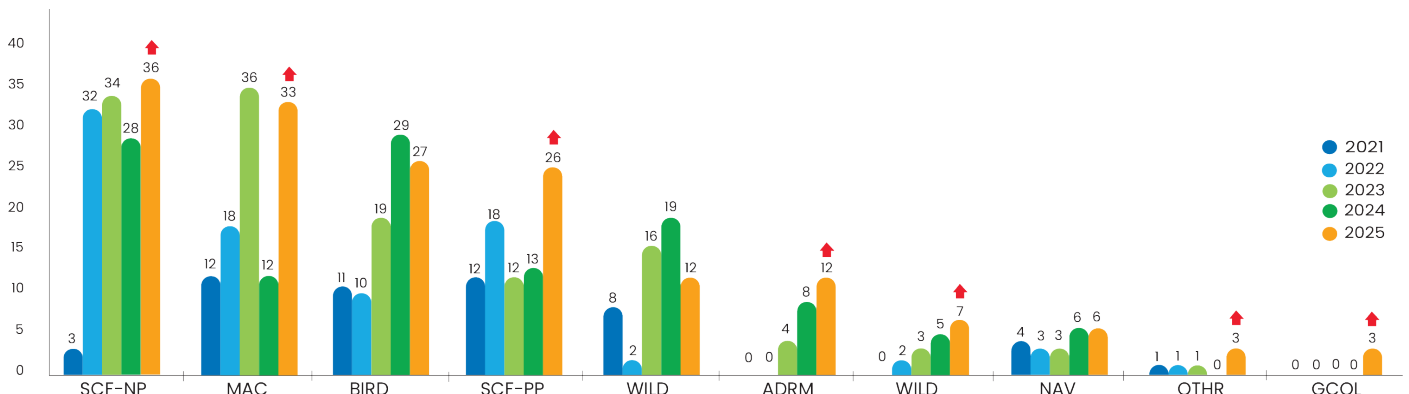


Chart 36: Number of occurrences related to State aircraft operations from 2021-2025 by occurrence categories
 Note: A single occurrence can be classified more than one occurrence category

Key Safety Issues

Chart 37 displays the key safety issues related to State aircraft operations. Issue highlighted in purple indicates occurrences directly linked to State operations, which could potentially affect the safety of civil aviation operations.

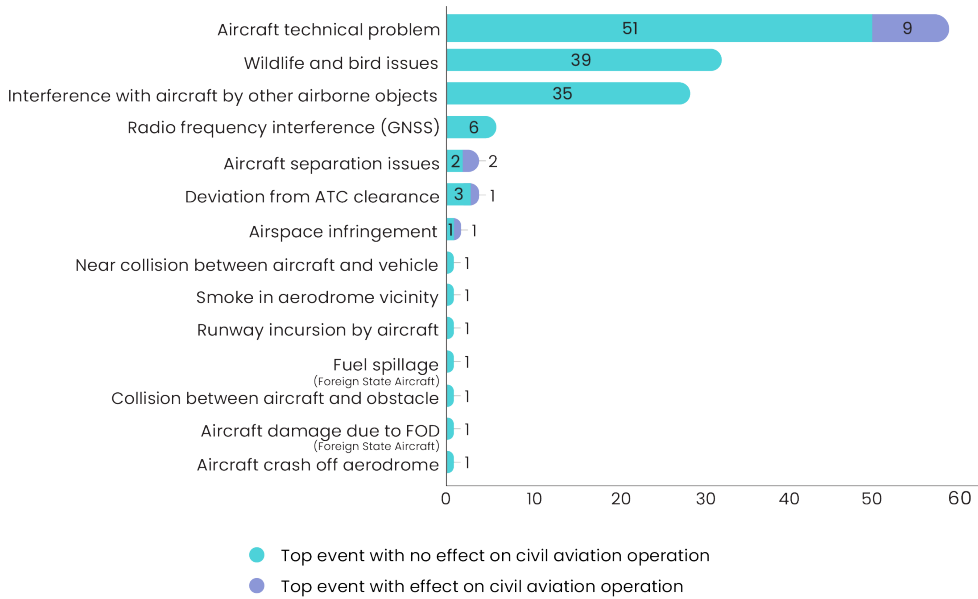


Chart 37: Number of key safety issues of State aircraft operations in 2025

There were thirteen occurrences (8%) related to aircraft technical problems, aircraft separation issues, deviations from ATC clearances, and airspace infringements that affected civil aviation operations. The first key safety issue concerned aircraft technical problems, which resulted in civil aircraft holding, delays, and/or go-around manoeuvres. With regard to aircraft separation issues, the review and analysis indicated that such occurrences may arise from insufficient coordination between military air traffic control units and civil air traffic control units. To prevent the recurrence of such occurrences, appropriate preventive and corrective measures should be established. These may include, inter alia, ensuring the continued airworthiness of aircraft and reinforcing compliance by air traffic control personnel to the Memoranda of Understanding (MoUs) governing the provision of air traffic services, including clearly defined roles, responsibilities, coordination procedures, and communication protocols agreed upon between civil and military organisations.



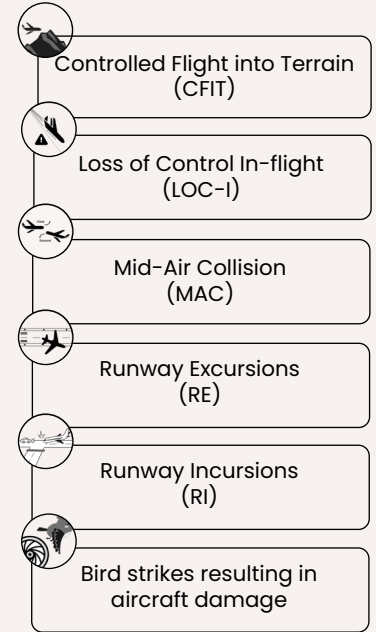
THAILAND AVIATION SAFETY ACTION PLAN (TASAP)

Thailand Aviation Safety Action Plan (TASAP) is Thailand's National Aviation Safety Plan (NASP), developed in alignment with the Global Aviation Safety Plan (GASP), and the Asia-Pacific Regional Aviation Safety Plan (AP-RASP). TASAP aims to strengthen aviation safety and reduce accidents, serious incidents, fatalities, and property damage by transforming safety data, such as Mandatory Occurrence Reports (MORs) and Voluntary Occurrence Reports (VORs), into safety information, which is further translated into Thailand-specific safety strategies and safety actions.

KEY OBJECTIVES OF TASAP

- 1** To ensure an effective safety oversight capability in Thailand
- 2** To support the effective implementation of the State Safety Programme (SSP)
- 3** To have an effective safety reporting system and promote Just Culture across the aviation industry
- 4** To promote active collaboration among aviation stakeholders to enhance safety in Thailand
- 5** To ensure aviation organizations implement and operate Safety Management System (SMS) across the entire aviation system

In addition, TASAP targets the reduction of occurrence rates related to:



During the period 2024-2025, 39 out of 72 Safety Actions under TASAP were implemented, demonstrating steady progress in the execution of national aviation safety initiatives.

2 actions were discontinued following the transfer of responsibilities of Safety Management Office to the Oversight Department, while the remaining actions are currently in progress and expected to be completed within the planned timeframe.

What's the TASAP



While some occurrence categories continue to exhibit fluctuations, the overall performance trend indicates that the **implementation and effectiveness of Safety Management Systems (SMS) across Thailand's aviation sector are strengthening**. This reflects improved capability in safety data analysis, risk-based decision-making, and proactive hazard mitigation, contributing to sustained safety performance improvement and **supporting the long-term objective of reducing accidents and serious incidents**.

Overall, the observed improvements in selected operational safety risk areas demonstrate that TASAP is functioning as an effective national safety planning mechanism, linking safety data analysis to targeted safety actions and measurable safety performance outcomes.



POSITIVE SAFETY CULTURE & JUST CULTURE ENHANCEMENT

Just Culture is a fundamental element of a Positive Safety Culture and serves as a foundation for reducing the risk of accidents and serious incidents.

Just Culture encourages personnel to report safety concerns without fear or unfair punishment. It is based on the principle that individuals should not be penalized for honest mistakes or unintentional errors, while willful violations, gross negligence, or destructive acts should be addressed appropriately.

By fostering Just Culture, safety reports and operational data will become available for analysis, enabling early identification of hazards and emerging risks. This proactive approach allows preventive actions to be implemented before safety issues escalate into serious incidents or accidents resulting in significant loss of life, property, or public confidence.

In 2025, TASAP placed strong emphasis on the enhancement and promotion of Positive Safety Culture and Just Culture within the Thailand aviation industry.

STATE AUTHORITY INITIATIVES

At the State authority level, the Civil Aviation Authority of Thailand (CAAT) developed Just Culture instructors and delivered Just Culture training to Aviation Safety Inspectors, personnel from the Aircraft Accident and Incident Investigation Commission (AAIC), Aviation Safety Management and Standards Assurance Officers, and other relevant staff. The objective of these initiatives was to encourage open and voluntary safety reporting without fear of unfair punishment, thereby strengthening trust and transparency within the safety reporting system.

In addition, Air Marshal Manat Chavanaprayoon, Director General of CAAT, demonstrated strong leadership commitment to fostering Just Culture by delivering a Just Culture for State Authority Managements seminar on 25 July 2025.

The seminar targeted personnel at all management level from CAAT, AAIC, and state aircraft operators, including the Royal Thai Air Force, Royal Thai Army, Royal Thai Navy, Royal Thai Police, and the Department of Royal Rainmaking and Agricultural Aviation, recognizing their shared responsibility in operating within the same airspace.

The objective of the seminar was to prepare senior management to actively support, sustain, and maintain the effective implementation of Just Culture across the Thailand aviation industry.

ENGAGEMENT WITH CIVIL AVIATION ORGANIZATIONS

On the same day, a Just Culture for Civil Aviation Organization (CAO) Executives was also conducted to support TASAP's key objective of establishing an effective safety reporting system and promoting Just Culture across the aviation industry.

The session establishing a common understanding and emphasized to Civil Aviation Organizations (CAOs) the importance of implementing Just Culture within their organizations.

At the conclusion of the seminar, it was honored by the participation of top management representatives from Aeronautical Radio of Thailand, Airports of Thailand, Bangkok Airways, SAMS Engineering, and Thai Airways, who shared their perspectives and organizational practices on the implementation of Just Culture.

An effective Just Culture enables open safety reporting without fear, which allows organizations to identify risks and hazards at an early stage. This supports safer operations, strengthens confidence in Thai aviation, and contributes to economic growth, ultimately supporting Thailand's goal of becoming a regional aviation hub.

Overall, this initiative contributes to the establishment of an effective safety reporting system and reinforces the promotion of Just Culture throughout the Thailand aviation industry.



As part of its ongoing international collaboration efforts, the CAAT, in close collaboration with the Civil Aviation Authority of Malaysia, the Civil Aviation Authority of Singapore, the Civil Aviation Authority of the Philippines, and the Directorate General of Civil Aviation of Indonesia, has jointly initiated a Regional Data Sharing Initiative.

The initiative aims to facilitate the exchange of de-identified safety data on high-frequency and operationally significant occurrences within the region. aims to facilitate the exchange of de-identified safety data on high-frequency and operationally significant occurrences within the region.

Since its establishment in late 2024, the initiative has received strong interest and positive engagement from ICAO Member States across the region. The shared data has contributed to enhancing regional safety intelligence, serving as a foundational basis for its development, and has further supported international collaboration through safety discussions, including the development of working papers and joint safety initiatives.

CAAT and all participating authorities, reaffirm that data exchanged under this initiative is strictly used for the purpose of maintaining and improving aviation safety. This commitment is formalized through a Memorandum of Understanding (MoU), which ensures the confidentiality, protection, and responsible use of shared safety data and information.



All international public airport operators and Approved Maintenance Organizations (AMOs) in Thailand were certified by AGA and AIR, in accordance with applicable regulatory requirements. This demonstrates the effectiveness of the State's safety oversight capability in ensuring compliance with national and international aviation safety standards and provides a strong foundation for safe aviation operations nationwide.

In addition, a safety conference on Loss of Control In-flight (LOC-I) was also organized by OPS to enhance awareness, share lessons learned, and promote effective mitigation strategies among aviation stakeholders.

As part of coordinated national effort, Thailand, through the National Runway Safety Committee, initiated the establishment of a National Runway Safety Programme and National Runway Safety Plan, aiming to reduce runway-related occurrences through coordinated actions, stakeholder collaboration, and the systematic management of runway safety risks

Within the same national safety framework, PEL conducted the CRM & Safety Enhancement Workshop in Aviation, held on 19 August 2025, to enhance safety awareness and strengthen the practical application of Crew Resource Management (CRM) principles within operational environments.

In parallel, CAAT, in collaboration representatives from across the aviation sector, continued to convene two Operational Task Force meetings with aviation operators to review Thailand's Hazard Register and conduct bow-tie workshops, with the objective of raising safety awareness and identifying appropriate mitigation actions. Thailand's Hazard Register is available on the CAAT website and can be accessed via the QR code below.

These activities were aligned with national safety objectives and contributed to ensuring safe and effective aviation operations across the Thailand aviation system.

Safety Activities & Engagement

In 2025, safety actions outlined under TASAP were conducted to continuously enhance aviation safety in Thailand.

Key operational safety initiatives included the publication of a safety bulletin encouraging industry personnel to voluntarily report errors or mistakes through Voluntary Occurrence Reports (VORs), to support hazard identification and safety trend analysis.

Appendix A:

List of accidents and serious incidents



List of accidents and serious incident in 2025

1. Thai registered aircraft

Local date	Occurrence class	Occurrence category	Operation type	Location name	Injury level	Narrative text
19 Feb 25	Non-fatal accident	ARC	General Aviation	VTUQ: Nakhon Ratchasima Airport, Thailand	None	The aircraft bounced while landing on the runway, and the propellers hit the ground.
17 Aug 25	Fatal accident	CTOL ¹	General Aviation	Phuket Airpark, Phuket, Thailand	Fatal Injury	Ultralight aircraft were unable to climb over the electrical wires and hit the top of the tree and subsequently impacted the ground.
20 Aug 25	Non-fatal accident	TURB	Commercial Air Transport	Between waypoint VETED and DOPID, Bay of Bengal, India	Serious Injury	The aircraft experienced turbulence during cruise.
13 Sep 25	Non-fatal accident	RE	General Aviation	Bird's Paradise Airpark, Sakon Nakhon, Thailand	None	During landing, the aircraft veered off the right side of the runway, hit a distance sign, and overturned.
16 Oct 25	Serious incident	F-NI	Commercial Air Transport	Aircraft on Ground for inspecting at Chiang Mai Airport, Thailand	None	During descent, smoke was detected in the aft cargo compartment. The aircraft declared an emergency and landed safely.

2. Foreign registered aircraft

Local date	Occurrence class	Occurrence category	Operation type	Location name	Injury level	Narrative text
25 Jan 25	Serious incident	ADRM	Commercial Air Transport	VTBS: Suvarnabhumi Airport, Thailand	None	The aircraft landed on Runway 20L instead of 20R at Suvarnabhumi Airport.

Note: ¹ CTOL: Collision with obstacle(s) during take-off and landing



Appendix B:

List of accronyms

A

AAIC	Aircraft Accident and Incident Investigation Commission
AAM	Advanced Air Mobility
AGA	Aerodrome Standards Department
AIR	Airworthiness and Aircrat Engineering Department
ALoSP	Acceptable Levels of Safety Performance
AMO	Approved Maintenance Organization
ANS	Air Navigation Service Standards Department
ANSs	Air Navigation Services
AOC	Air Operator Certificate
AOM	Aircraft Operating Manual
ASM	Airspace Management
ATA	Air Transport Association
ATC	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATO	Approved Training Organization
ATS	Air Traffic Service

C

CAAT	Civil Aviation Authority of Thailand
CAO	Civil Aviation Organization
CAT	Commercial Air Transport
CEs	Critical Elements
CMA	Continuous Monitoring Approach
CMS	Compliance Monitoring System
CNS	Communications, Navigation and Surveillance Service
COSCAP-SEA	Cooperative Development of Operational Safety and Continuing Airworthiness Programme – South East Asia
CRM	Crew Resource Management

D

DG	Dangerous Good
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E

EGPWS	Enhanced Ground Proximity Warning System
EI	Effective Implementation
ERC	Event Risk Classification
eVTOL	electric Vertical Take-off and Landing

F

FCOM	Flight Crew Operating Manual
FIR	Flight Information Region
FOD	Foreign Object Debris

G

GASP	Global Aviation Safety Plan
GEN	Generic Organisational (GEN) Safety Objective
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSE	Ground Service Equipment

H

HRCs	High-Risk Categories
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I

IASA	International Aviation Safety Assessment
IFSD	Inflight Shutdown
ILS	Instrument Landing System

L

LRST	Local Runway Safety Teams
LVO	Low Visibility Operations
LVP	Low Visibility Procedure

M

MCAI	Mandatory Continuing Airworthiness Information
MOR	Mandatory Occurrence Report
MoU	Memorandum of Understanding

N

NCASB	National Civil Aviation Safety Board
NRSSC	National Runway Safety Subcommittee

O

OCCs	Occurrences
OPR	Specific Operational (OPR) Safety Objective
OPS	Flight Operations Standards Department

P

PEL	Personnel Licensing Department
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R

RASG-APAC	Regional Aviation Safety Group – Asia Pacific
RFI	Radio Frequency Interference
RTA	Royal Thai Army
RTAF	Royal Thai Air Force
RTN	Royal Thai Navy
RTP	Royal Thai Police

S

SMO	Aviation Safety Management and Standards Assurance Office
SMS	Safety Management System
SPI	Safety Performance Indicator
SPT	Safety Performance Target
SSP	State Safety Programme

T

TASAP	Thailand Aviation Safety Action Plan
TCARs	Thailand Civil Aviation Regulations
TCAS RA	Traffic Collision Avoidance System - Resolution Advisory

U

UAS	Unmanned Aircraft Standards Department
USOAP	Universal Safety Oversight Audit Programme
UTM	Unmanned Aircraft System Traffic Management

V

VOR	Voluntary Occurrence Reporting
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W

WHM TF	Wildlife Hazard Management Task Force
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