Thailand
Annual Safety Report
2020

CAAT
สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Contents

Foreword

The Aviation Safety Management Department (SMD) of the Civil Aviation Authority of Thailand (CAAT) has direct responsibility for the collection and analysis of safety data and safety information in support of the Thailand State Safety Programme (SSP). In April 2020, this was enhanced through the publication of the Civil Aviation Authority of Thailand Requirement No. 22/2562 on "Reporting of Civil Aviation Occurrences" (Requirement No. 22/2562). This requires Civil Aviation Organisations (CAOs) to report hazards and occurrences that have an impact on aviation safety to CAAT.

Since the implementation of the Requirement No. 22/2562, the CAAT has received an increasing number of occurrences. There has also been an improvement in the quality of the information being reported. However, there is still a need to improve the number of reports received and the quality of the information provided that will improve the overall risk picture for Thailand.

This report provides the overall picture of safety risk for Thailand for the period of 2019 to 2020. It highlights key safety issues for the different aviation sectors that need to be prioritised by industry and will also be targeted as part of the CAAT surveillance programme.

The report highlights those occurrence reports that have the potential to result in fatal accidents. These are identified as the High-Risk Categories (HRCs) which are recognised globally as occurrences that should be prioritised for action to reduce fatal accidents.

The report also provides a summary of accidents and serious incidents that have been investigated by the Aircraft Accident Investigation Committee of Thailand (AAIC).

Last but not least, I hope this first published annual safety report will provide an overview of aviation safety in Thailand to all readers.

Mr. Kajonpat Maklin
Manager of Aviation Safety Management Department
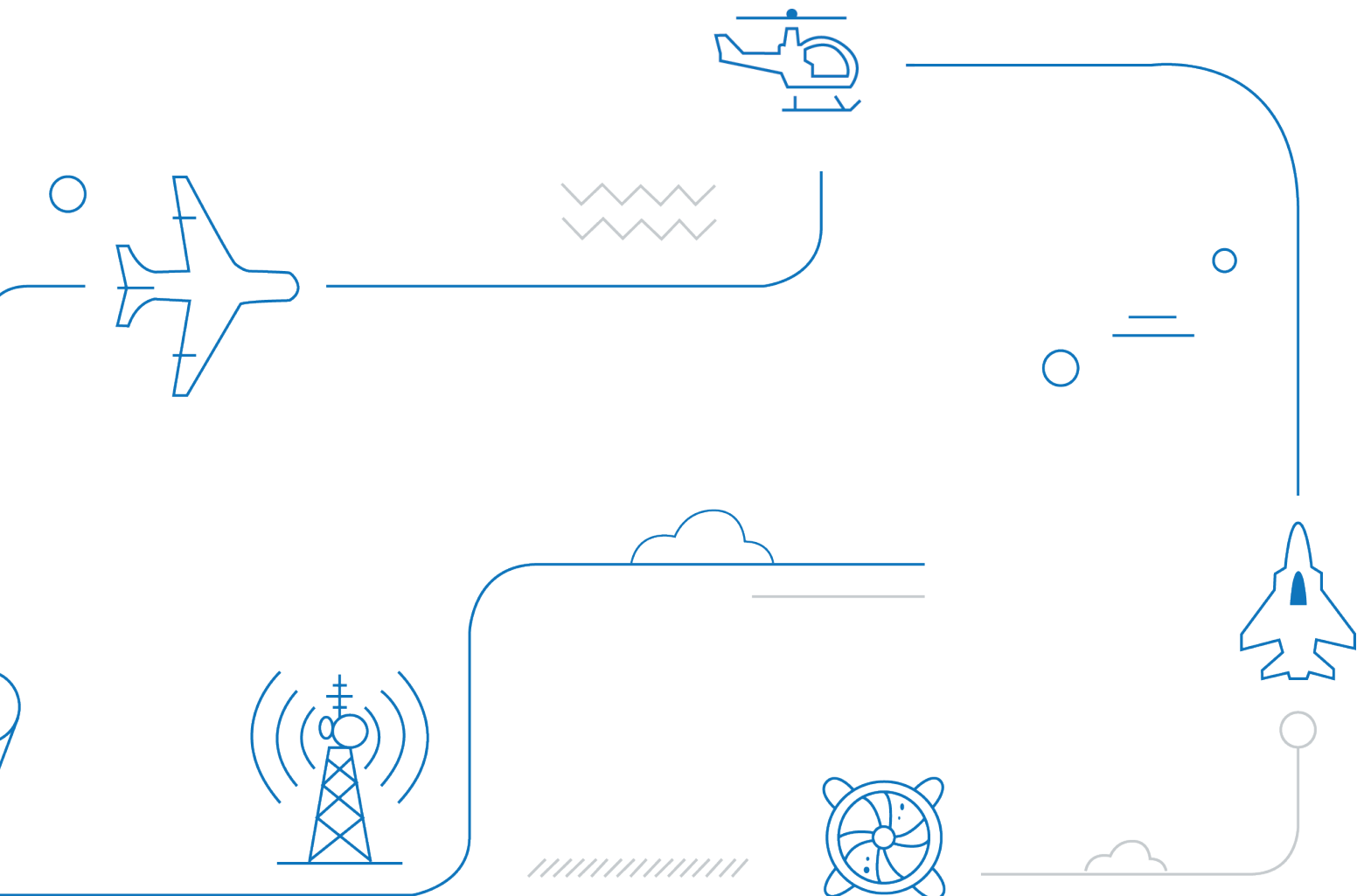
Executive Summary

This report is based on the occurrence reports received by CAAT in 2019 and 2020. It is structured around the different aviation sectors. It provides a high-level summary of the analysis of the occurrences collected and accidents and serious incidents investigated by the AAIC. It examines the safety performance across Thai aviation industry and the main key safety issues.

The topics have been structured by operation types of each aviation sector which are:

- Commercial Air Transport
  - Fixed-wing Aircraft
  - Helicopter
- General Aviation
- Approved Training Organisations
- Air Navigation Service Providers
- Aerodrome Operators, and
- State Aircraft

It highlights those occurrence categories with high potential to escalate into HRC accidents that are targeted and prioritizing the actions in the Thailand Aviation Safety Action Plan (TASAP).

Introduction

Thailand Aviation Safety Occurrence Reporting

Reliable safety data and safety information is a fundamental key for safety management. This means that effective safety management depends on the effectiveness of safety data collection and analysis. In accordance with the second edition of the ICAO Annex 19, Safety Management, this requires States to establish a Safety Data Collection and Processing System (SDCPS) and to capture, store, aggregate, and enable the analysis of safety data and safety information.

The valuable safety data and safety information derived from CAOs enables CAAT to manage safety risk effectively through reactive and proactive methods of hazard identification and risk mitigation. In addition, CAAT developed the Requirement No. 22/2562 as a reporting mechanism for CAOs to report a wealth of safety data including mandatory and voluntary safety reporting systems as well as automated data capture systems in order to proactively control the hazards and mitigate the risks before contributing to an accident.

Who is responsible to submit the report?

As safety is everyone's responsibility, anybody is eligible to report any safety deficiency, safety issue, hazard or safety concern. No matter who you are, what organisation you work for, CAAT welcomes your participation in aviation safety reporting with our commitment to protect and treat your report confidentially in accordance with just culture principles in order to ensure that the related information will be protected and not be used for purposes other than maintaining or improving aviation safety. The more reports we receive, the more CAAT will be able to analyse so that Thailand aviation safety can be improved.

CAAT has developed a mechanism and its guidance material for reporting of civil aviation occurrence which can be found at www.caat.or.th/occurrence

In addition to the Mandatory Occurrence Reports (MORs) we also encourage individuals and organisations to report Voluntary Occurrence Reports (VORs). VORs include the reporting of potential hazards, errors, mistakes and near miss events that do not result in a significant occurrence or event.
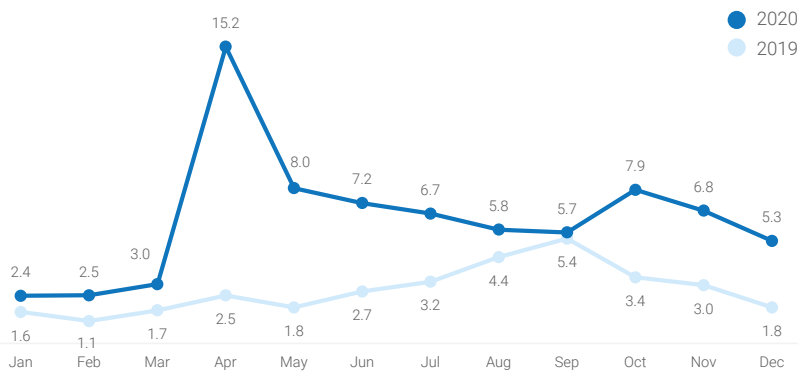
Figure 1: Occurrence reporting rate per 1,000 flight movements in 2020

Figure 1 shows the overall occurrence reports received between the period of 2019 and 2020. In 2020 there were 2,371 occurrence reports submitted to CAAT, This was a 76% increase over 2019 even though there was a reduction in flight operation activities. Since the publication of the Requirement No. 22/2562, the rate has increased steadily. This increase should be viewed in a positive light as it indicates a strong reporting culture, one of the indicators that CAOs have a mature Safety Management System (SMS) in place.

Aircraft Accidents & Serious Incidents

In 2020, the number of accidents and serious incidents is slightly less than the previous year, but there was less aviation activities in 2020 compared to 2019 due to COVID-19 pandemic. Thai registered aircraft that operated within Thailand were involved in 6 accidents and 12 serious incidents. Thailand has not had a fatal aviation accident both as a state of occurrence and state of registry in the period 2019 - 2020.

Table 1: Number of Annex 13 occurrences recorded by AAIC

Year	Accidents	Serious Incidents
2019	8	13
2020	6	12
Total	14	25

Figure 2 shows the most common occurrences were System/Component Failure or Malfunction (Powerplant) (SCF-PP) followed by System/Component Failure or Malfunction (Non-Powerplant) (SCF-NP) and Runway Excursion (RE). It should be noted for some of these occurrences they could be categorised with multiple categories if the criteria is met.

However, the statistic of aircraft accidents and serious incidents in this section provided by AAIC   is limited to preliminary investigations and not necessarily from the final investigation report.
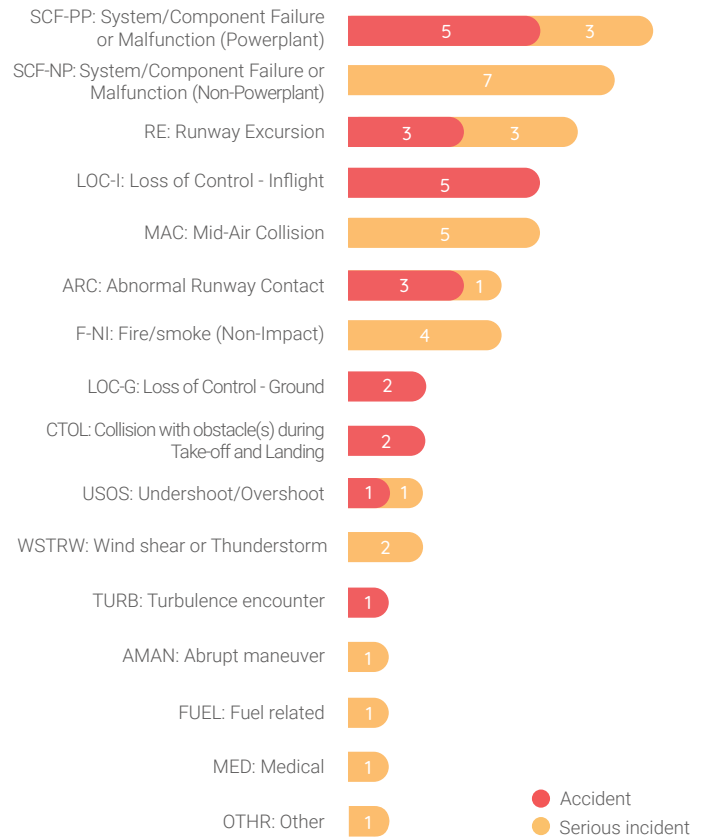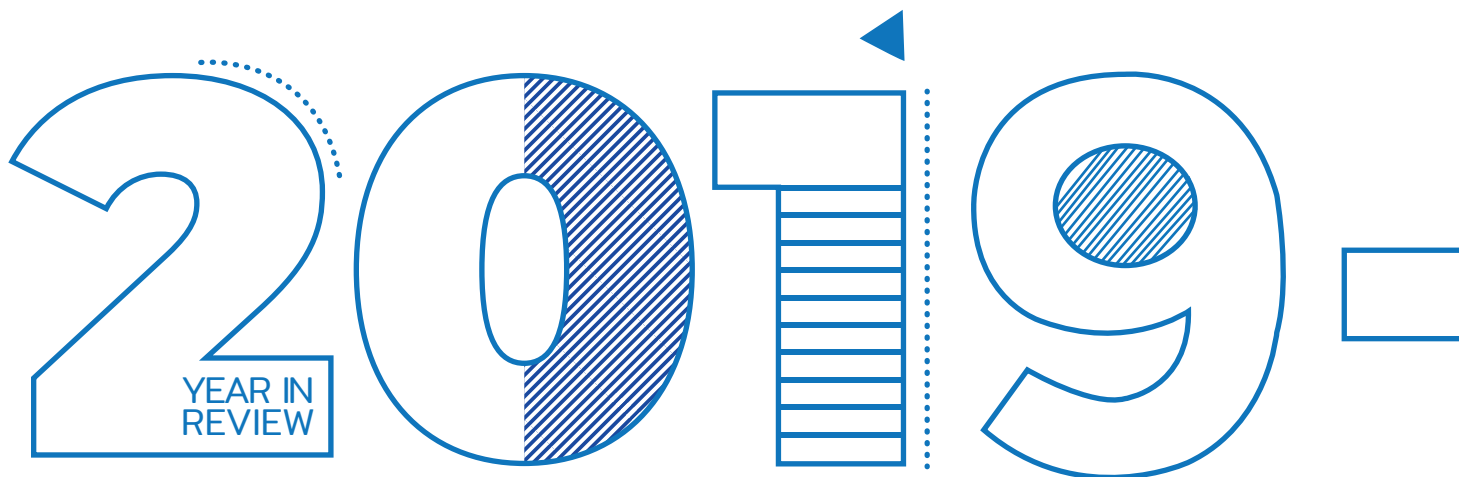

Figure 2: Number of Annex 13 occurrences by occurrence categories

- SCF-PP: System/Component Failure or Malfunction (Powerplant) — Accident 5, Serious incident 3
- SCF-NP: System/Component Failure or Malfunction (Non-Powerplant) — Serious incident 7
- RE: Runway Excursion — Accident 3, Serious incident 3
- LOC-I: Loss of Control - Inflight — Accident 5
- MAC: Mid-Air Collision — Serious incident 5
- ARC: Abnormal Runway Contact — Accident 3, Serious incident 1
- F-NI: Fire/smoke (Non-Impact) — Serious incident 4
- LOC-G: Loss of Control - Ground — Accident 2
- CTOL: Collision with obstacle(s) during Take-off and Landing — Accident 2
- USOS: Undershoot/Overshoot — Accident 1, Serious incident 1
- WSTRW: Wind shear or Thunderstorm — Serious incident 2
- TURB: Turbulence encounter — Accident 1
- AMAN: Abrupt maneuver — Serious incident 1
- FUEL: Fuel related — Serious incident 1
- MED: Medical — Serious incident 1
- OTHR: Other — Serious incident 1

● Accident
● Serious incident

2019 YEAR IN REVIEW

Aircraft Accidents & Serious Incidents
breakdown by type of operations

Below is how the accidents and serious incidents are classified by the type of operation.

Commercial Air Transport

Aeroplane
Accident   1
Serious Incident   20

Helicopter
Accident   0
Serious Incident   1

General Aviation

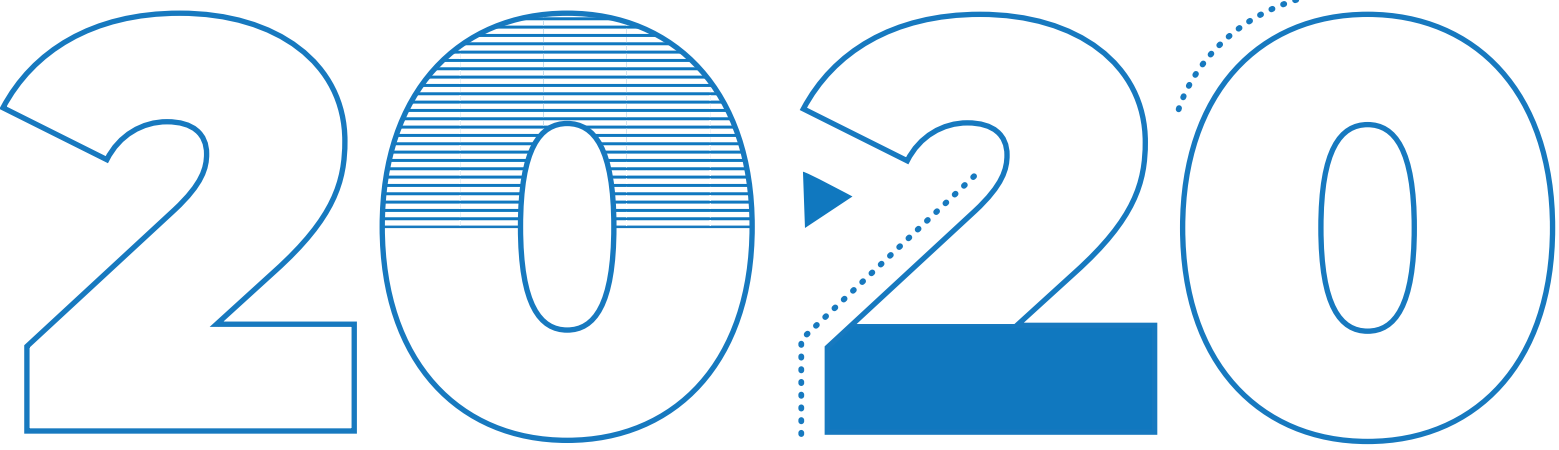Accident   13
Serious Incident   4

Aerial Work

Accident   0
Serious Incident   0

2020

Occurrence Categories

The 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 the CAAT.

Abnormal Runway Contact (ARC)	Any landing or take-off involving abnormal runway or landing surface contact.
Abrupt Maneuver (AMAN)	The intentional abrupt maneuvering of the aircraft by the flight crew.
Aerodrome (ADRM)	Occurrences involving aerodrome design, service, or functionality issues.
ATM/CNS (ATM)	Occurrences involving Air Traffic Management (ATM) or Communication, Navigation, Surveillance (CNS) service issues.
Birdstrike (BIRD)	Occurrences involving collisions/near collisions ingestion of one or several birds which may occur in any phase of flight.
Cabin Safety Events (CABIN)	Miscellaneous occurrences in the passenger cabin of transport category aircraft.
Evacuation (EVAC)	Used only for passenger carrying operations involving transport category aircraft.
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.
Fire/Smoke (Post-impact) (F-POST)	Fire or smoke resulting from an accident impact.
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.
Ground Collision (GCOL)	Collision while taxiing to or from a runway in use.
Ground Handling (RAMP)	Occurrences during (or as a result of) ground handling operations.

Icing (ICE)	Accumulation of snow, ice, freezing rain, or frost on aircraft surfaces that adversely affects aircraft control or performance.
Loss of Control - Ground (LOC-G)	Loss of aircraft control while the aircraft is on the ground.
Medical (MED)	Occurrences involving illnesses of persons on board the aircraft.
Navigation Error (NAV)	Occurrences involving the incorrect navigation of aircraft on the ground or in the air.
Other (OTHR)[1]	Any occurrence not covered under another category.
Security related (SEC)	Criminal/Security acts which result in accidents or incidents.
System/Component Failure or Malfunction (Non-Powerplant) (SCF-NP)	Failure or malfunction of an aircraft system or component other than the powerplant.
System/Component Failure or Malfunction (Powerplant) (SCF-PP)	Failure or malfunction of an aircraft system or component related to the powerplant.
Turbulence Encounter (TURB)	In-flight turbulence encounter.
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.

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

What are the ICAO's High-Risk Categories?

The Global 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). HRCs need to be addressed to mitigate the risk of fatalities. The following occurrence categories have been identified as HRCs in the ICAO Global Aviation Safety Plan (GASP) 2020-2022 Edition and are considered relevant for Thailand.

Controlled Flight into Terrain (CFIT)

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

Loss of Control In-flight (LOC-I)

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

Mid-Air Collision (MAC)

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

Runway Excursion (RE)

A veer off or overrun off the runway surface.

Runway Incursion (RI)

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.

Scope & content of the report

The following sections are a summary of the occurrence analysis carried out by CAAT which is divided by sector. Each sector consists of 2 main parts:

Occurrence Classification

This section provides a comparison of the occurrences rate between 2019 and 2020, represented by the occurrence categories. The metrics have been calculated against the number of flights where that data is available. This will take into consideration variations in the levels of activity rather than just the number of occurrences.

Key Safety Issues

This section summarises the key safety issues related to each operation. The occurrences highlighted in red were the occurrences that could lead to a HRCs.

Where possible significant safety issues and risks have been highlighted for each sector. As many occurrences involved multiple sectors the reader should look at all of the data and not just the sector that they operate in. It is also important that the reader looks beyond just looking at the number of occurrences but also the significance of the occurrences (those that could result in a fatal accident and highlighted in red).

This report covers the variety of operational domains in the Thai aviation industry which included:

Commercial Air Transport

This section outlines occurrences and key safety issues related to commercial air transport airline (passenger and freighter) operations involving fixed-wing aircraft, helicopters such as Helicopter Emergency Medical Service (HEMS) as well as offshore oil/gas.

General Aviation

This section outlines occurrences and key safety issues related to general aviation operation other than a commercial air transport operation or an aerial work operation.

Approved Training Organisations

This section outlines occurrences and key safety issues related to approved training operations in Thailand.

Air Navigation Service Providers

This section outlines occurrences and key safety issues related to air navigation services or is an acknowledged occurrence from Air Navigation Service Providers (ANSPs) in Thailand Airspace (BKK FIR).

Aerodrome Operators

This section outlines occurrences and key safety issues related to aerodrome and ground handling operations in Thailand.

State Aircraft

This section outlines occurrences and key safety issues related to State aircraft operations.
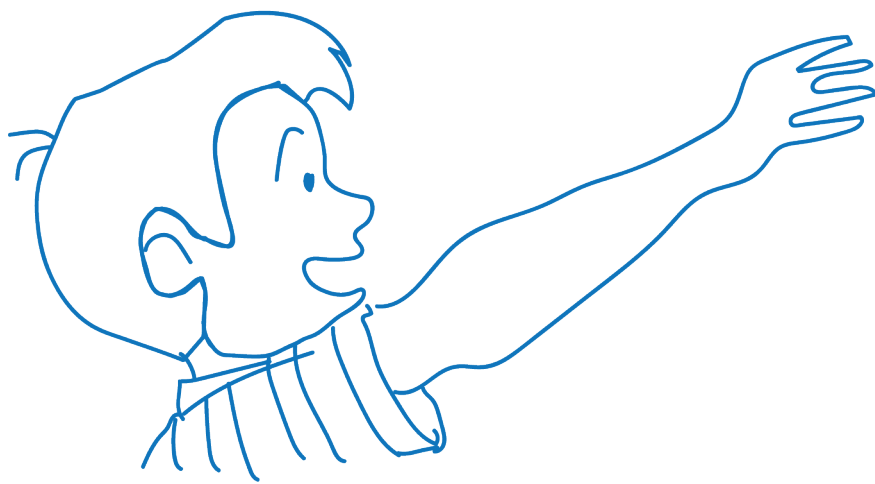
Commercial Air Transport

Fixed-wing Aircraft

This section provides a more detailed breakdown of occurrences. They are broken down by event types using the occurrence category. Reducing the risk of accidents in Commercial Air Transport (CAT) is the highest priority for CAAT. CAAT is responsible for targeting those issues that have the high potential to escalate to HRCs as part of their surveillance activities.
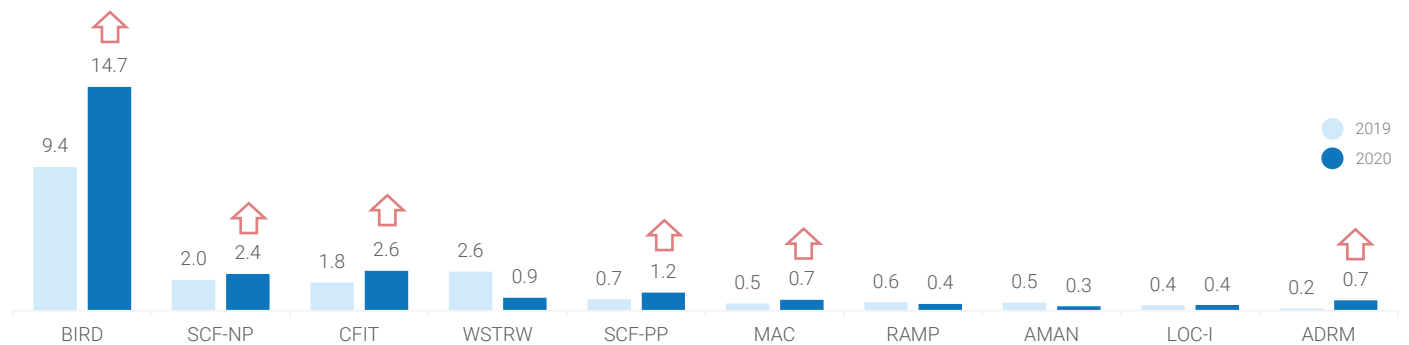
Occurrences Classification

Rate per 10,000 flight movements

Figure 3: Rate of occurrences related to CAT - Fixed-wing Aircraft Operations

Key Safety Issues

Between 2019 and 2020, the top 5 events were birdstrikes, weather and environment encounters, unstabilised approaches, TAWS/GPWS caution warnings and ACAS/TCAS RAs. Although birdstrikes are the most frequent occurrence these very rarely result in an accident but due to the frequency it is still considered a significant safety issue for Thailand. More details of birdstrikes are available in the Aerodrome section.
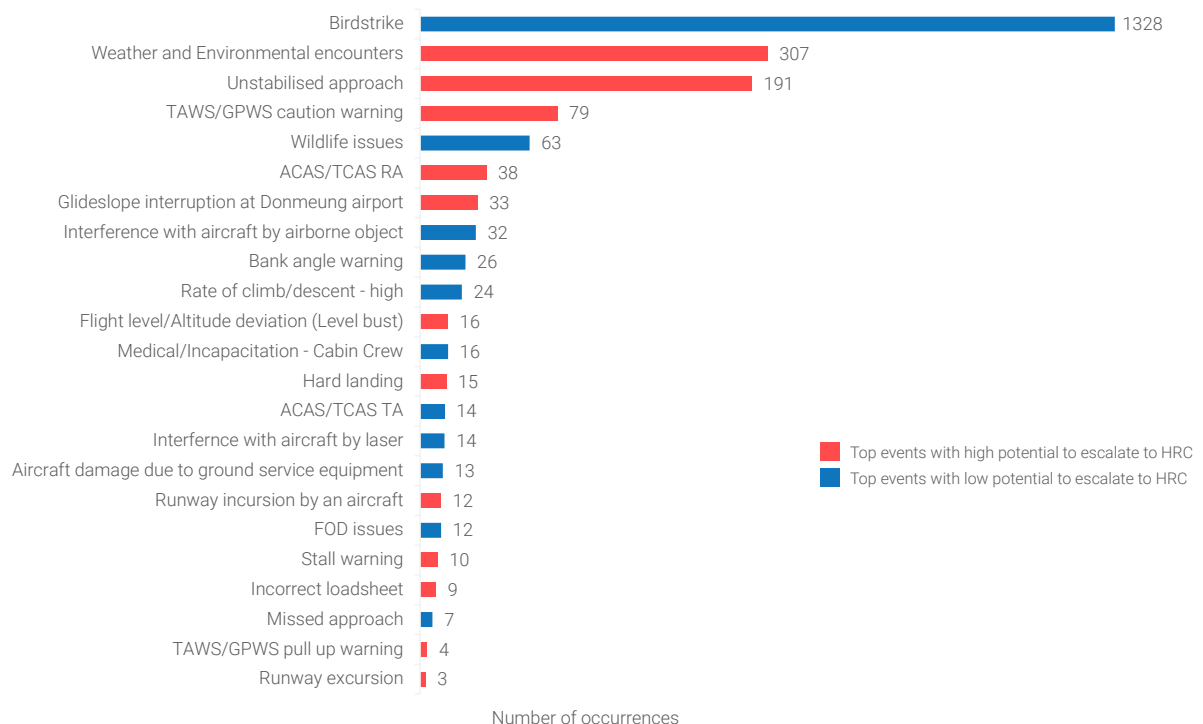
Figure 4: Top event types related to CAT - Fixed-wing Aircraft Operations

Weather and environment encounters are another high occurring category but also a significant contributing factor to most top events such as unstabilised approaches, aircraft loss of control, stall warnings, TAWS/GPWS caution warnings and runway excursions.

Unstabilised approaches that continue to land is also a significant occurrence and safety issue for Thailand. There has been an increase in Thailand that reflects a global trend that is likely to be related to the COVID-19 pandemic and pilots flying less frequently to maintain their currency.

Mode	Number
Sink rate	43
Glideslope	11
Terrain	9
Too low flaps	6
Windshear	5
Obstacle ahead	3
Too low terrain	2

● Aural warning priority
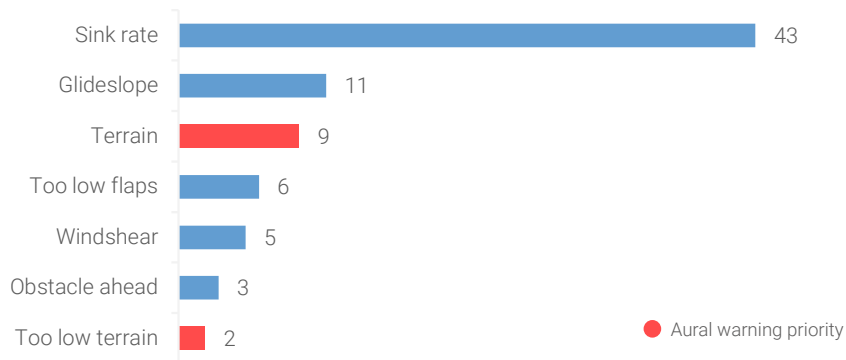
Figure 5: Number of TAWS/GPWS cautions and warnings by mode

Figure 5 shows details about TAWS/GPWS caution warning. Sink rate, Glideslope, and Windshear warnings have the highest numbers, and most of them caused by adverse weather encounters. Terrain and other obstacle ahead are contributed by existing terrain around the aerodrome at Mae Hong Son and Samui respectively.

Another top event, that is significant to aircraft operation, we should focus on is interference with laser. There is an increasing number of occurrences of lasers being pointed at aircraft. The brightness of lasers is very powerful with visibility up to 1 km away. This can cause distraction and visual impairment of the flight crew at a critical phase of flight. Most of these events occur at Suvarnabhumi Airport. CAAT is working with the local authorities on enforcement action in order to control the use of lasers.
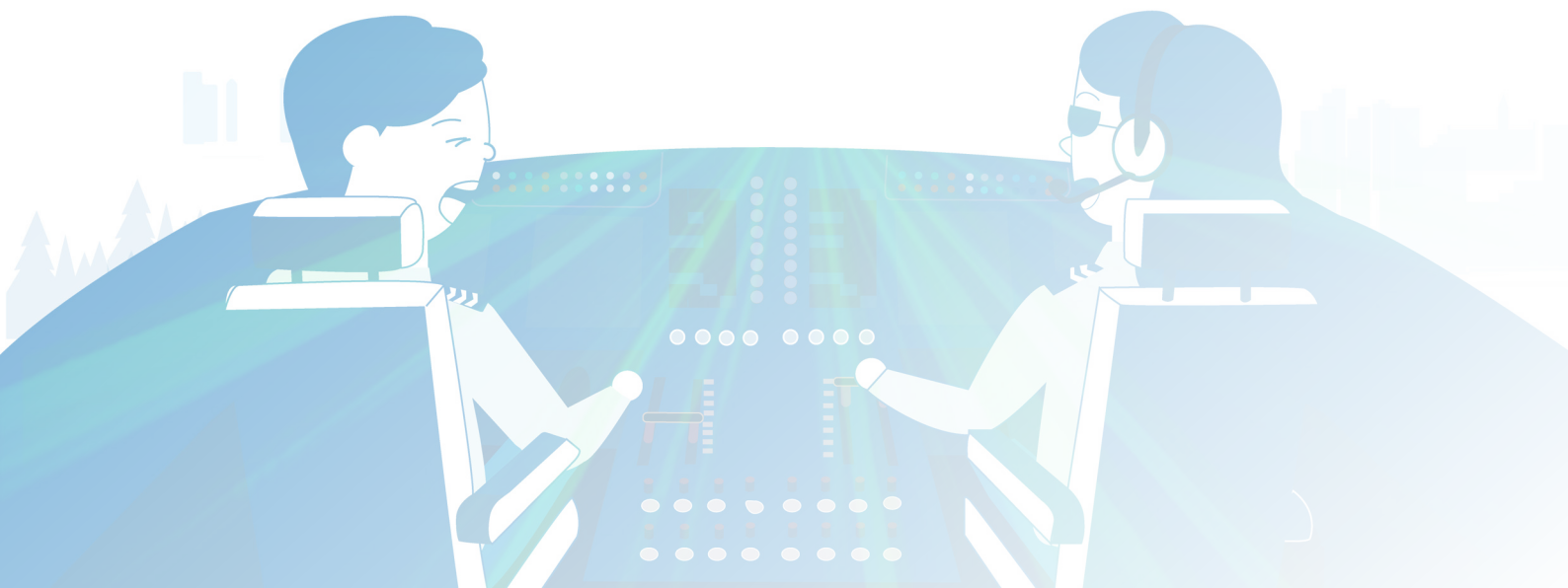
System Component Failure in Fixed-wing Aircraft Operations

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

In 2019-2020, there were 94 SCF-NP occurrences related to fixed-wing aircraft operations. Figure 6 shows the number of SCF-NP occurrences breakdown by aircraft system.
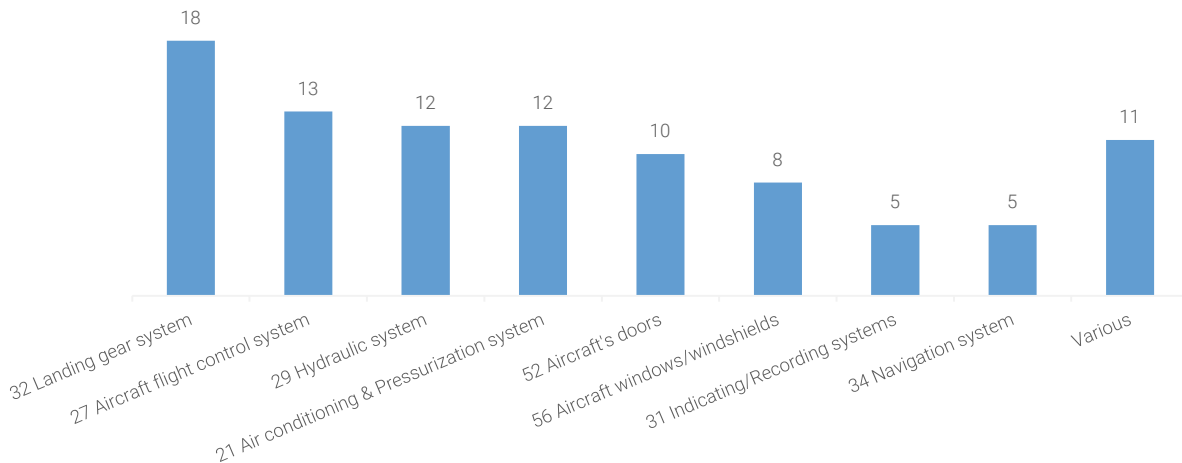
Figure 6: Number of SCF-NP occurrences related to Fixed-wing Aircraft Operations

Most Landing gear system occurrences were related to tyre failures.
Most Flight control system occurrences were related to the flap control system.
Most Hydraulic system occurrences were related to hydraulic leaks.
Most Air conditioning & Pressurisation system occurrences were related to pressurisation failures.

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

In 2019-2020, there were 73 SCF-PP occurrences. Table 2 shows the operational impact from those occurrences where details were provided in the report. Most occurrences resulted in aborted take-offs that have the potential to result in a runway excursion. All engine malfunctions can significantly increase the workload on the flight crew leading to more significant safety events.

Table 2: Consequences to aircraft operations resulted by aircraft engine malfunctions

Effects of the engine malfunctions on flight	Number of occurrences
Air turn back	28
Aborted take-off	21
Return to bay	5
Diversion	2
Emergency landing	2
Lack of information	15
Total	**73**

For many technical malfunctions there is insufficient detail in the occurrence reports for a more detailed analysis. Operators are encouraged to provide more detail on system and component failures once a technical investigation has been carried out.

Helicopter

This section addresses the occurrences reported by Thai helicopter operators who hold an Aircraft Operator Certificate (AOC) issued by CAAT. The number of occurrences received between 2019 and 2020 by occurrence category is shown in Figure 7. The top 5 occurrence categories were System/Component Failure or Malfunction (Non-Powerplant) (SCF-NP), Birdstrike (BIRD), System/Component Failure or Malfunction (Powerplant) (SCF-PP), Aerodrome (ADRM), and Cabin Safety Events (CABIN).

Occurrences Classification

Rate per 1,000 flight movements
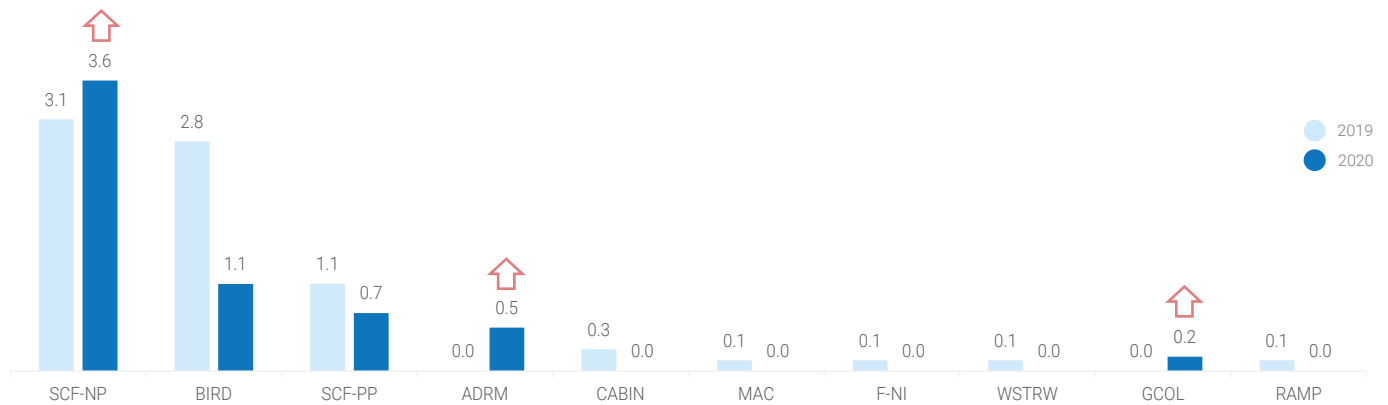
Figure 7: Rate of occurrences related to CAT - Helicopter Operations

Key Safety Issues

The most common safety issue identified from MORs which took place in 2019 - 2020 was birdstrike. All of these occurrences were low-risk occurrences as these events did not result in aircraft damage. The second most common event type was warning system triggered. The key safety issues related to helicopter operations could be summarised in Figure 8.
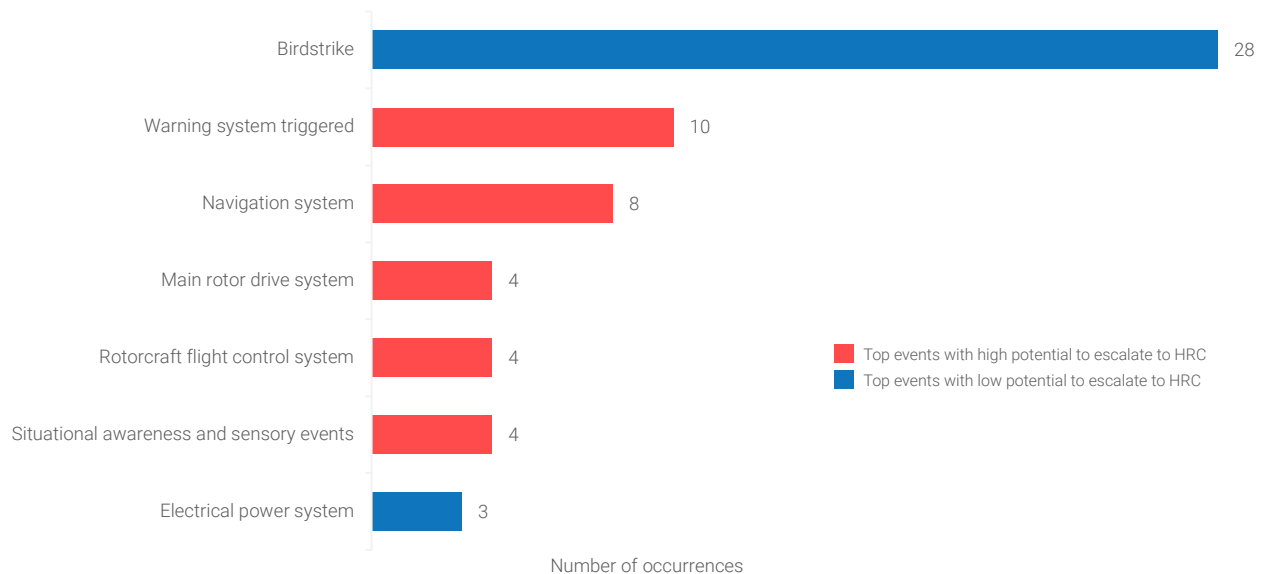
Figure 8: Top event types related to CAT - Helicopter Operations

System Component Failure in Helicopter Operations

In 2019-2020, there were 46 system component failure occurrences related to helicopter operations. Figure 9 shows the number of system component failure occurrences breakdown by aircraft system. 12 occurrences were related to powerplant systems (SCF-PP) and 34 occurrences were related to other systems (SCF-NP).
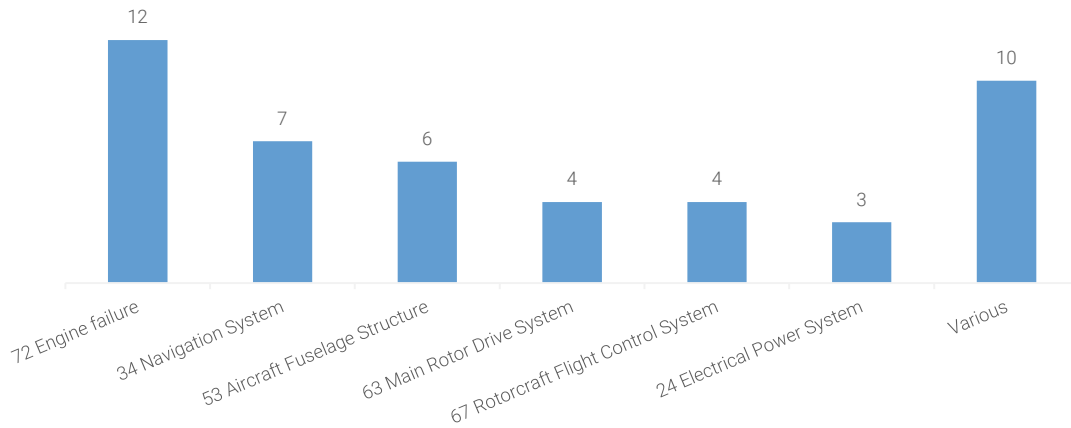
Figure 9: Number of system component failure occurrences related to Helicopter Operations
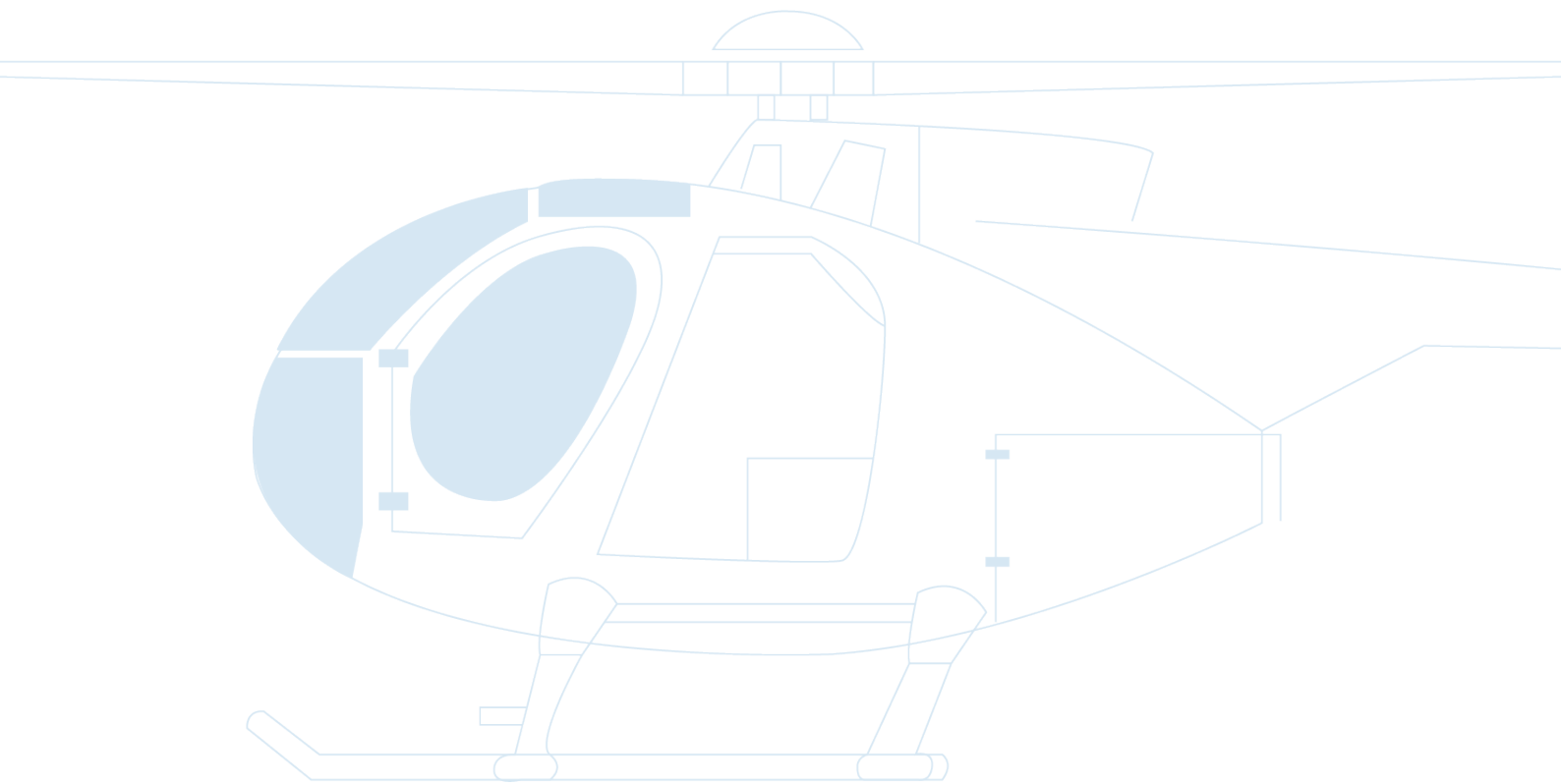
General Aviation

Since April 2020, the occurrence reporting regulation has only been effective. CAAT has a relatively low number of occurrences reported for General Aviation (GA) in Thailand. For 2019 and 2020, CAAT only received 9 occurrence reports related to general aviation. As a result it is challenging to analyse and identify safety issues for the general aviation operations. The summary of safety issues is based on the limited occurrences reported. We would like to encourage people who fly general aviation aircraft to report occurrences to the CAAT to help us in the safety data analysis process to improve safety towards general aviation operations in the future.

The most frequent occurrence categories for general aviation operations were System/Component Failure or Malfunction (Non-Powerplant) (SCF-NP), Mid-Air Collision (MAC), Navigation Error (NAV), and Undershoot/Overshoot (USOS) as shown in Figure 10.

Occurrences Classification

Rate per 1,000 flight movements
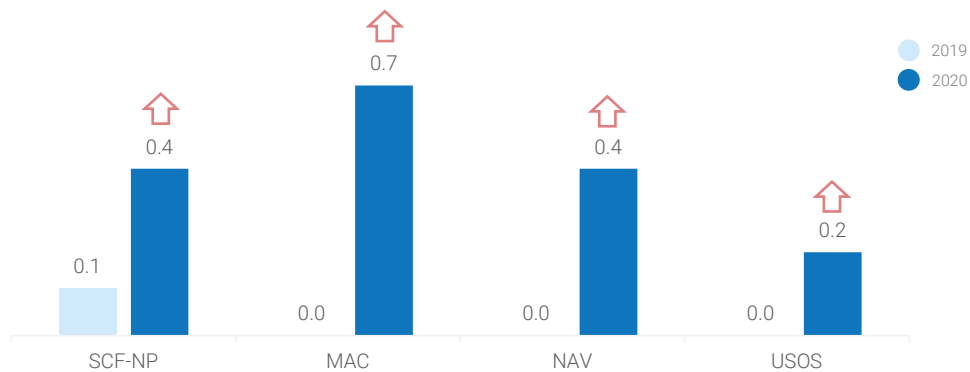
Figure 10: Rate of occurrences related to General Aviation Operations

Key Safety Issues

Table 3 summarises the key safety issues related to general aviation operations in 2019 - 2020.

Table 3: Top event types related to General Aviation Operations

Event types	Number of occurrences
Near airborne collision with other airborne object	2
Landing - Undershoot	1
Loss of separation	1
Engine oil system	1
Approach clearance deviation	1
Main landing gear system	1
Wrong runway - Landing	1
Radio communication failure - One Way	1

Approved Training Organisations

This section addresses the occurrences reported by the Approved Training Organisations (ATOs). For 2019 and 2020, CAAT received 53 occurrence reports related to ATO's activities. The top 5 occurrence categories were System/Component Failure or Malfunction (Non-Powerplant) (SCF-NP), Navigation Error (NAV), Birdstrike (BIRD), Runway Incursion (RI), and Mid-Air Collision (MAC).

Occurrences Classification

Rate per 10,000 flight movements
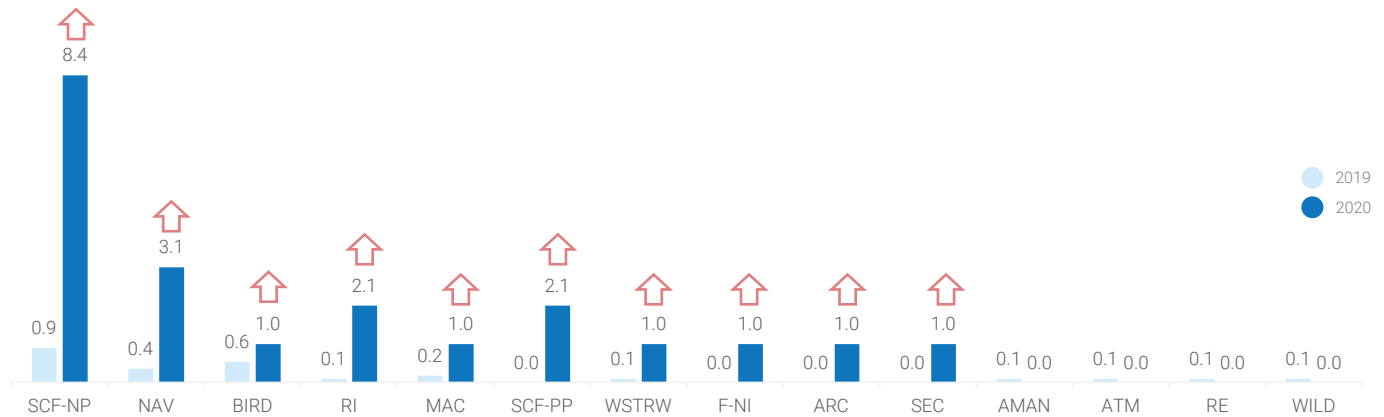
Figure 11: Rate of occurrences related to ATO's activities

Key Safety Issues

Figure 12 shows the key safety issues related to ATO's activities in 2019 - 2020. There are 5 event types that are the key safety issues for the ATOs, including tyre failure, birdstrike, landing gear system, situational awareness and sensory events, and loss of separation. Two of these event types which are the situational awareness and sensory events and the loss of separation have a high potential to escalate to HRC and impact commercial air transport activities if this results in the infringement of commercial air transport airspace.
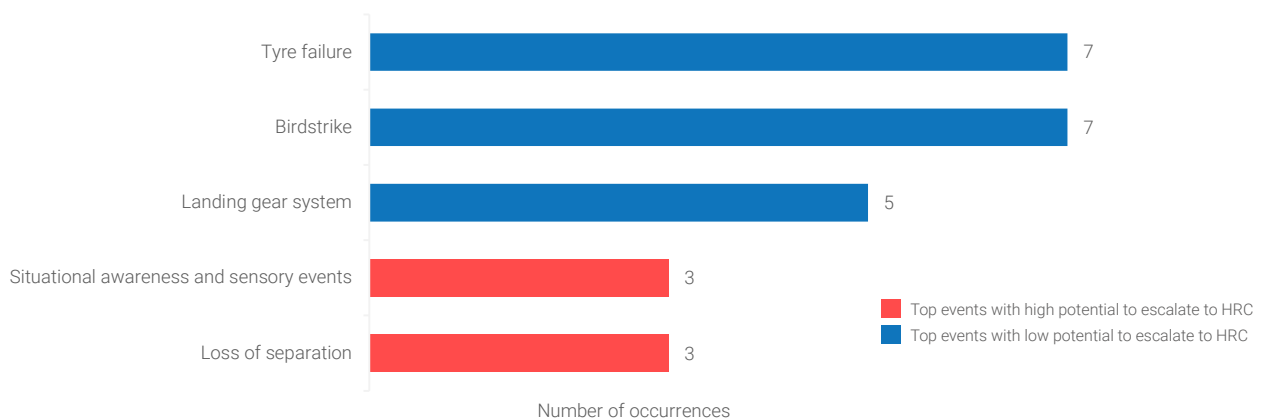
Figure 12: Top event types related to ATO's activities

System Component Failure related to Approved Training Organisations Activities

In 2019-2020, there were 20 system component failure occurrences related to ATO's activities. Figure 13 shows the number of system component failure occurrences breakdown by aircraft system. There were 2 occurrences that the reporters did not specify which aircraft system was malfunction. Most landing gear system were related to tyre failures.
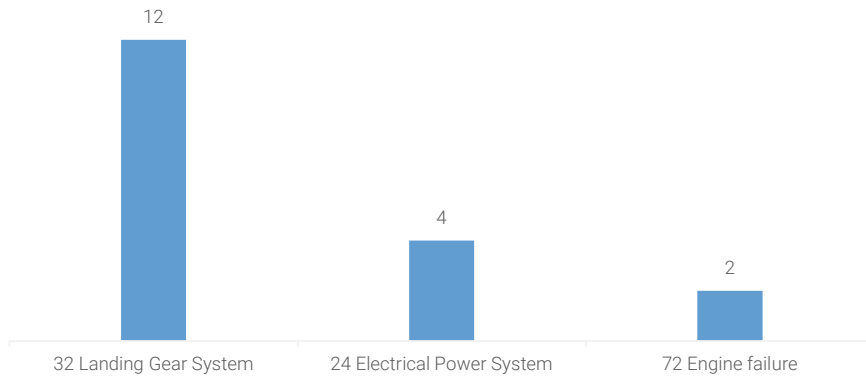
Figure 13: Number of system component failure occurrences related to ATO's activities
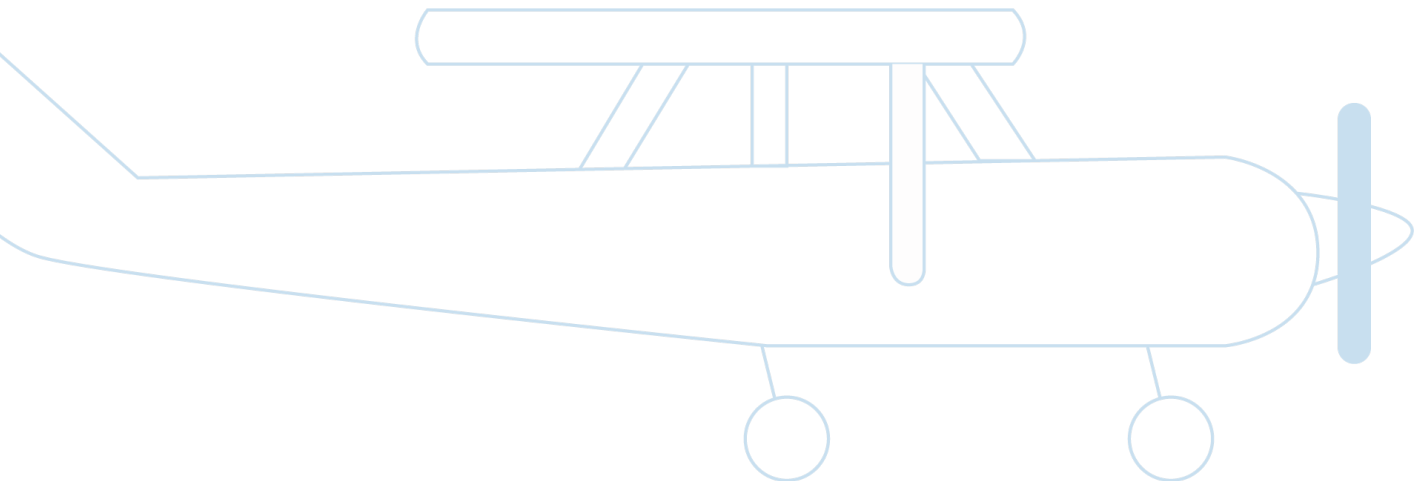
Air Navigation Service Providers

This section addresses the occurrences related to air navigation services. This includes occurrences related to enroute operations in Thailand Airspace (BKK FIR). The number of occurrences received between 2019 and 2020 by occurrence category is shown in Figure 14. The most frequent occurrence reports were Mid-Air Collision (MAC), Controlled Flight into Terrain (CFIT), and Abrupt Maneuver (AMAN). Most abrupt maneuver occurrences are linked to flight crew taking avoiding actions as a result of being in close proximity to other aircraft. These are often as a result of communication issues between Air Traffic Controllers and Pilots.

Occurrences Classification

Rate per 100,000 flight movements in BKK FIR
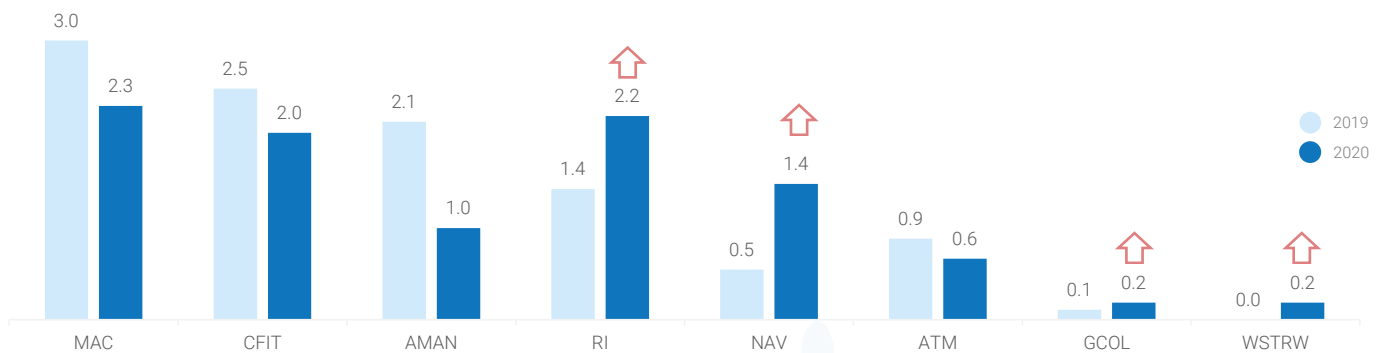
Figure 14: Rate of occurrences related to Air Navigation Services

Key Safety Issues

When the occurrence reports are broken down further by event types this provides a deeper understanding of the events involved in the reports. The top event types from Figure 14 are shown in Figure 15.

Event type	Number of occurrences
Loss of separation	46
Glideslope interruption at Donmeung airport	33
Runway incursion by an aircraft	15
Runway incursion by a vehicle	11
Airspace infringement	7
Taxiway incursion by an aircraft	5
ATM clearance cancelled	3

■ Top events with high potential to escalate to HRC
■ Top events with low potential to escalate to HRC

Number of occurrences

Figure 15: Top event types related to Air Navigation Services

The most significant safety issues that air navigation service providers (ANSPs) should focus on are loss of separation and runway incursions. These types of events have the potential to result in accidents with a high number of fatalities.

Most loss of separation events occurred under the Bangkok Approach Control. The challenge of this airspace is the high traffic volume and airspace restrictions related to the INTOS departure route after taking off from Donmueng Airport. These events have the potential of causing loss of separation events and creating a high workload to both flight crew and air traffic controller especially when there are adverse weather conditions or periods of high traffic volumes.

Most runway incursion events occurred at Donmeung Airport where there is high traffic volume. Air traffic controllers are under a lot of pressure to manage traffic flows to ensure aircraft operate on time. This can result in the flight crew being under pressure when taxiing the aircraft as instructed. These can lead to runway incursion events.

Human Factors contribute to many of the air navigation service related events. In some cases this is not caused directly by the ANSP but they can also play an important role in identifying and preventing loss of separation and runway incursion events.

Glideslope interruption occurrences at Donmeung Airport are a very high-frequency occurrence. Even though the short-term mitigation actions have been implemented, the number of occurrences continues to increase as seen in Figure 15. Therefore, it requires engagement of various aviation stakeholders including the air navigation service provider, the aerodrome operator and the air operators to develop a more effective risk mitigation.

"GLIDE SLOPE GLIDE SLOPE"
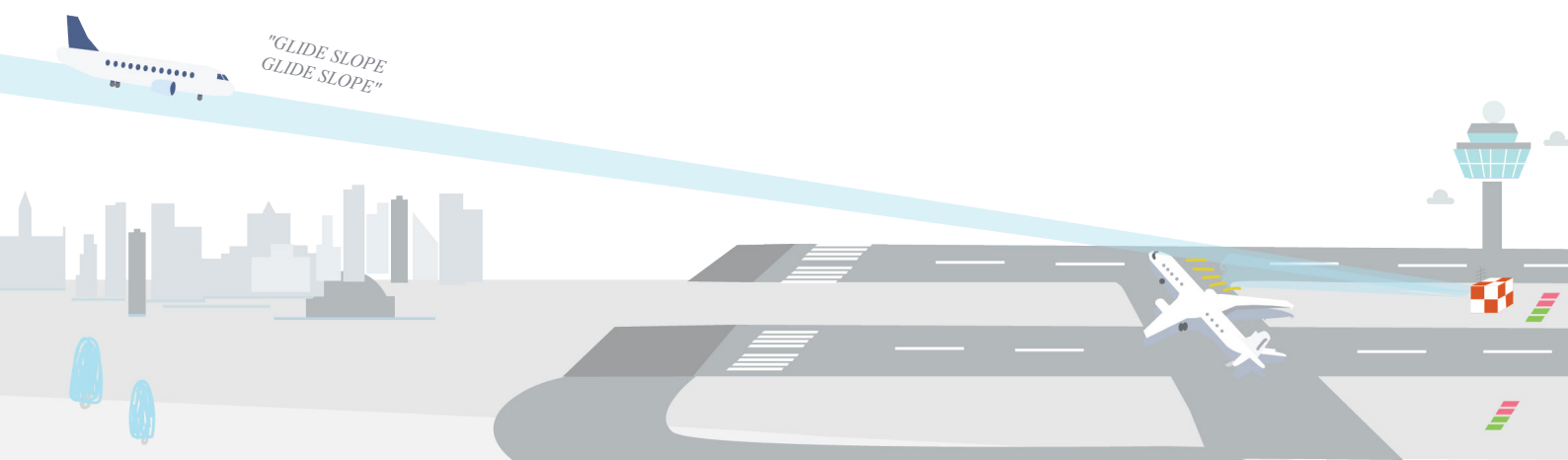
Aerodrome Operators

This section addresses the operational safety risks related to aerodrome operations. The number of occurrences received between 2019 and 2020 by occurrence category is shown in Figure 16. The most frequent operational safety risks are bird hazards followed by wildlife, glideslope capture, Foreign Object Debris (FOD) and ground vehicle operation issues, respectively. These occurrences can all potentially contribute to accidents or serious incidents.

Occurrences Classification

Rate per 10,000 aircraft movements
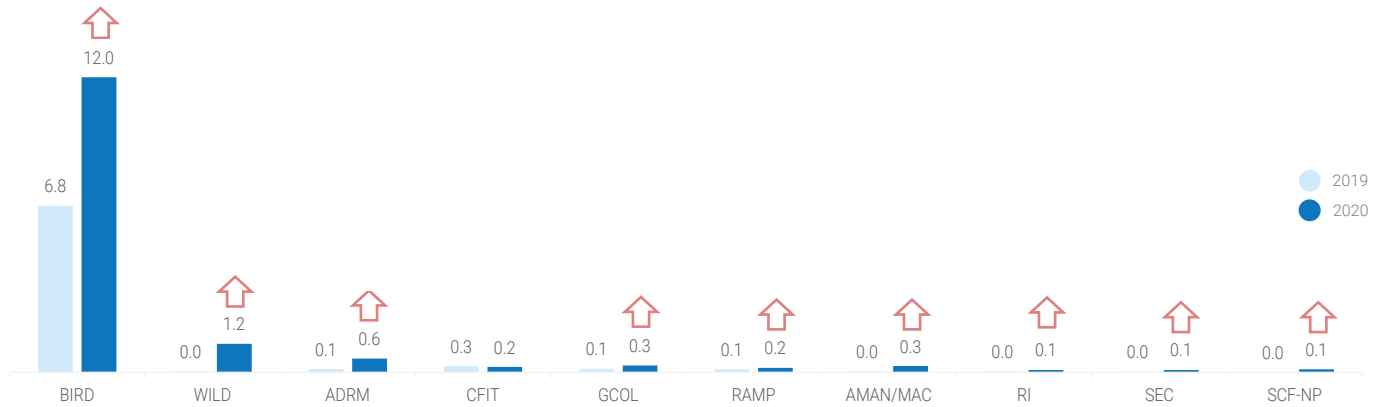
Figure 16: Rate of occurrences related to Aerodrome Operations

Key Safety Issues

Figure 17 shows a breakdown of the occurrences into the key safety issues related to aerodrome operations.
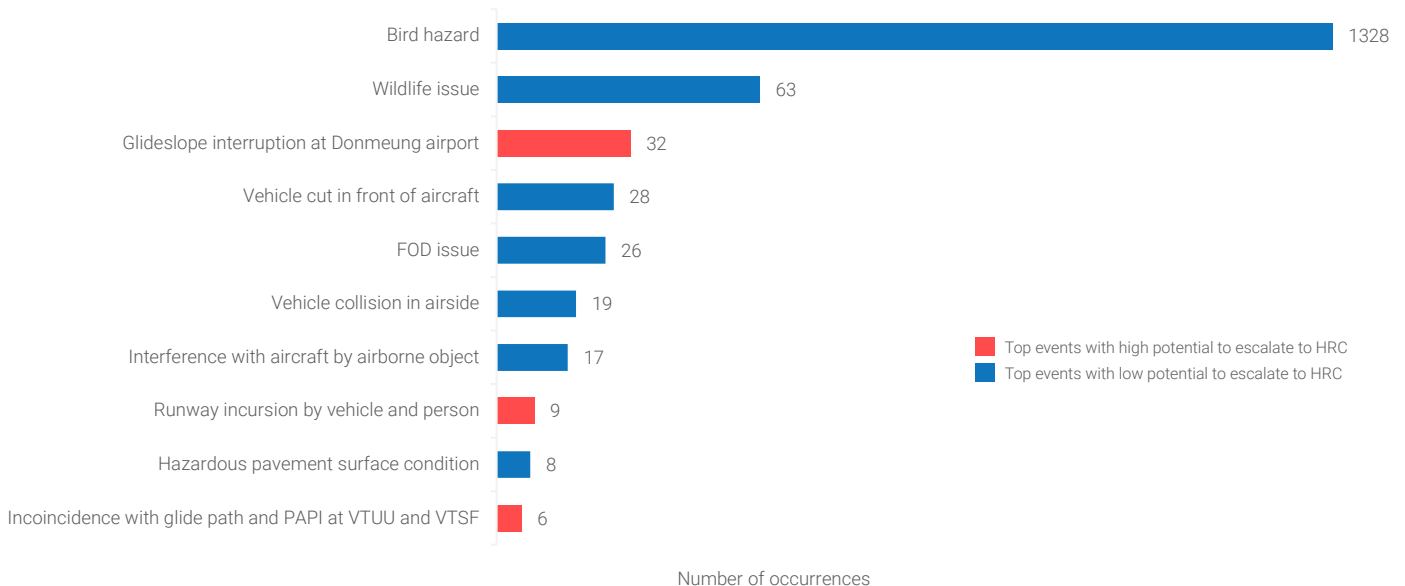
Figure 17: Top event types related to Aerodrome Operations

It should be noted that most of the ground vehicle operation occurrences reported are caused by failure to comply with airside driving rules and regulations which could result in injury to passengers or ground staff, and aircraft damage. In addition, aerodrome operators have primary responsibility for safe operations in the aerodrome. This includes the development of preventive control measures to reduce the probability of occurrence.

Foreign Object Debris (FOD) issues
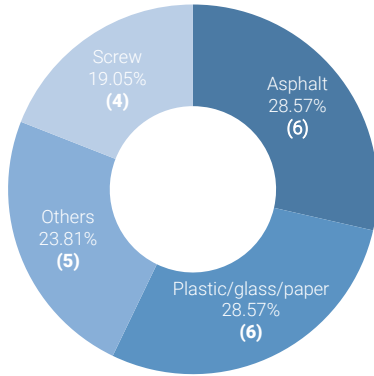
Figure 18: Percentage of FOD issues by object

These are one of the risks involving aerodrome operation which can cause damage to aircraft. FOD issues are caused by a variety of factors including inadequate maintenance of buildings, equipment, and aircraft, inadequate staff training, and weather. This is also as a result of poor housekeeping and clearing up by the different aerodrome users including ground handlers, aircraft cleaners, maintenance, instead of and aerodrome operator and airline operator ground staff. Therefore, FOD prevention is the responsibility of all aerodrome users. While the aerodrome operator is responsible for daily inspection of the runways, taxiways and airside areas, airline or ground handling agents are also responsible to ensure their operations are free of FOD.

Birdstrike & Wildlife issues

Rate per 10,000 aircraft movements
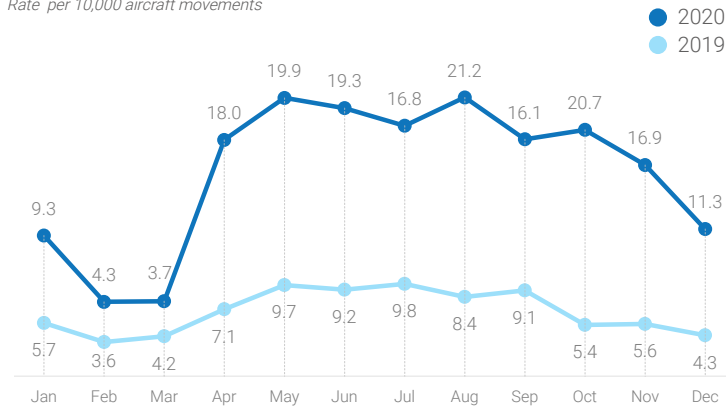
Figure 19: Rate of bird hazards by month

There has been an increase in birdstrike and wildlife issues in 2020. This is likely to be as a result in the COVID-19 pandemic and the reduction in air traffic resulting in more birds and wildlife inhabiting the aerodromes and the surrounding areas. Aerodromes need to develop wildlife management programmes that identify the bird/wildlife species, habitation and migration behaviours to reduce the level of bird activities in and around the aerodromes as well as taking actions when wildlife is detected or reported.

Percentage of birdstrikes causing damage by aircraft part
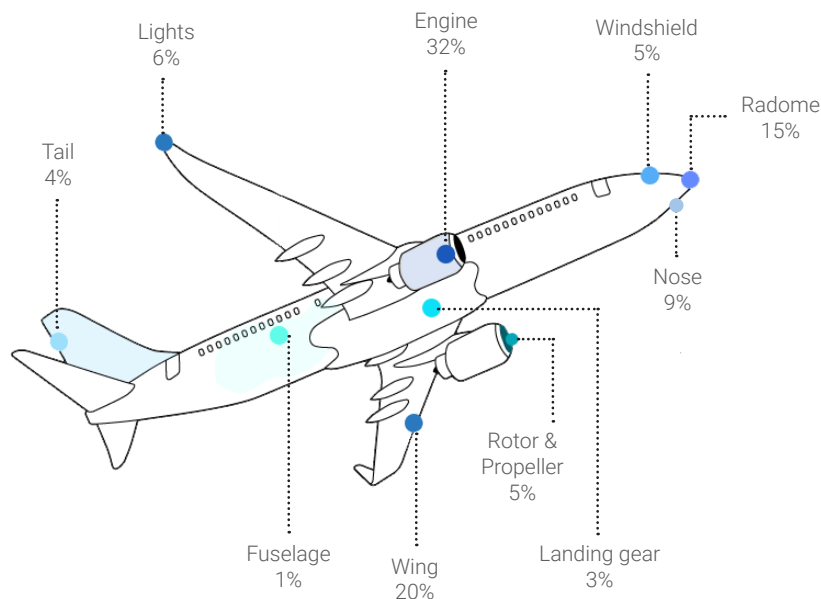
Figure 20: Percentage of bird hazards by part of damage

Figure 21 shows a breakdown of birdstrikes in relation to the phase of flight.
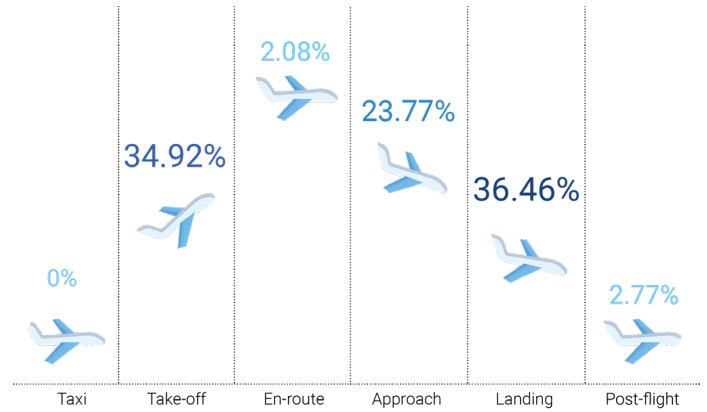
Figure 21: Percentage of bird hazards by aircraft flight phase

Rate of birdstrike occurrences by airport

Rate per 1,000 aircraft movements

The airports shown in the table below are the top 10 airports where have the highest rate of birdstrike occurrences in 2020.

Table 4: Rate of birdstrike occurrences by airport

Airport	2019	2020	Trend
VTPH (HHQ): Prachuap Khiri Khan/Hua Hin	8.5	2.9	⬇
VTUI (SNO): Sakhon Nakhon/Bankhai	0.3	2.8	⬆
VTPP (PHS): Phitsanulok	2.3	2.6	⬆
VTBS (BKK): Suvarnabhumi Bangkok/Intl	0.7	2.0	⬆
VTPO (THS): Sukhothai	2.3	1.7	⬇
VTUV (ROI): Roi et	1.1	1.6	⬆
VTSF (NST): Nakhon si thamarat	2.9	1.5	⬇
VTSR (UNN): Ranong	1.4	1.5	⬆
VTUD (UTH): Udon thani	0.4	1.4	⬆
VTUU (UBP): Ubon ratchathani	0.8	1.4	⬆

Figure 22: Rate of bird hazards by airport

Rate of wildlife occurrences by airport

Rate per 1,000 aircraft movements

The airports shown in the table below are the top 10 airports where have the highest rate of wildlife occurrences in 2020.

Table 5: Rate of wildlife occurrences by airport

Airport	2019	2020	Trend
VTCN (NNT): Nan	0.0	1.2	⬆
VTBO (TDX): Trat	0.0	1.1	⬆
VTUV (ROI): Roi et	0.0	1.1	⬆
VTUD (UTH): Udon thani	0.0	1.0	⬆
VTUI (SNO): Sakhon Nakhon/Bankhai	0.0	0.8	⬆
VTSC (NAW): Narathiwat	0.0	0.8	⬆
VTST (TST): Trang	0.0	0.5	⬆
VTPP (PHS): Phitsanulok	0.0	0.3	⬆
VTSP (HKT): Phuket	0.0	0.2	⬆
VTBD (DMK) : Don Mueng/Intl	0.0	0.1	⬆

Breakdown by wildlife type
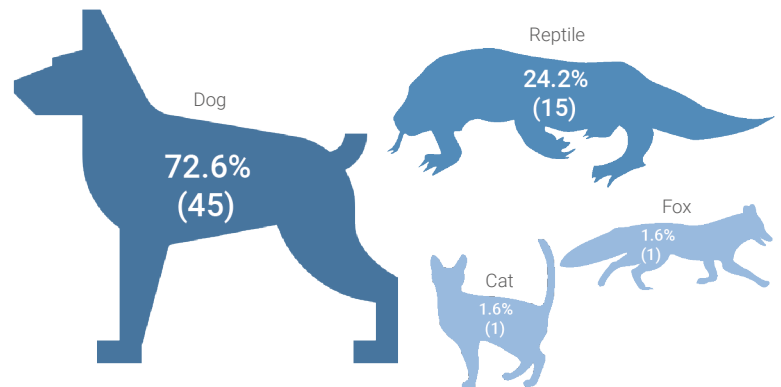
Figure 23: Percentage of wildlife issues by wildlife type

State Aircraft

Although CAAT has no responsibility for the oversight of State aircraft, CAAT receive occurrence reports from the CAOs. Figure 24 shows a summary of these occurrences as they are part of the Thailand State Safety Programme and are reviewed by the National Civil Aviation Safety Board (NCASB).

Occurrences Classification
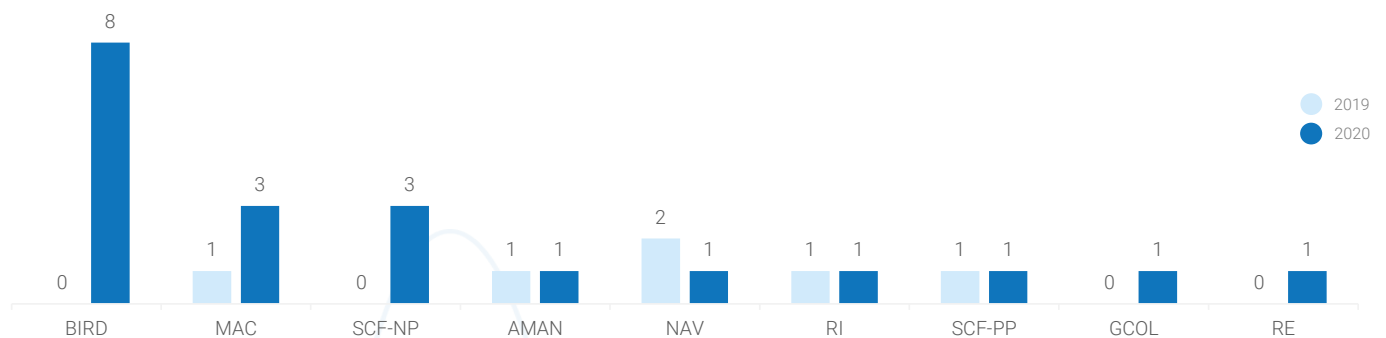
Figure 24: Number of occurrences related to State Aircraft Operations

Key Safety Issues

Figure 25 shows the safety issues related to State aircraft operations. Most airborne conflict events were caused from pilots misunderstanding and poor coordination of the air traffic controllers between military and civil air traffic control units. For the flight crew Air Traffic Management (ATM) procedure deviation, this event involved flight crew deviation from applicable ATM procedures such as take off without air traffic control (ATC) clearance and inaccurate position reporting. These event types can potentially contribute to a mid-air collision.
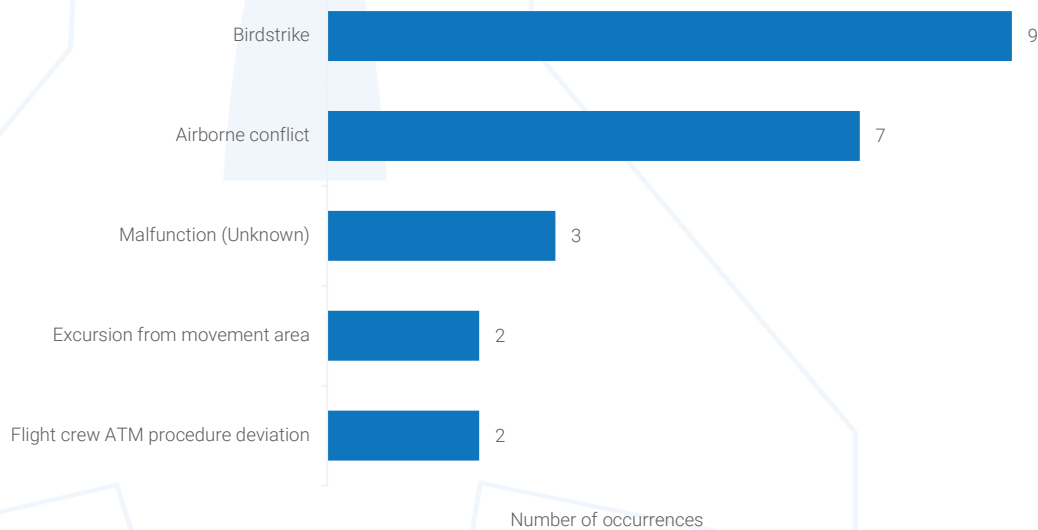
Figure 25: Top event types related to State Aircraft Operations

List of acronyms

A

AAIC	Aircraft Accident Investigation Committee of Thailand
ACAS	Airborne Collision Avoidance System
AOC	Aircraft Operator Certificate
ANSP	Air Navigation Service Provider
ATA	Air Transport Association of America
ATC	Air Traffic Control
ATM	Air Traffic Management
ATO	Approved Training Organisation

C

CAT	Commercial Air Transport
CAAT	Civil Aviation Authority of Thailand
CAO	Civil Aviation Organisation
CICTT	Commercial Aviation Safety Team/ICAO Common Taxonomy Team

F

FIR	Flight Information Region
FOD	Foreign Object Debris

G

GA	General Aviation
GASP	ICAO Global Aviation Safety Plan
GPWS	Ground Proximity Warning System

H

HEMS	Helicopter Emergency Medical Service
HRC	High-Risk Categories

I

ICAO	International Civil Aviation Organization

M

MOR	Mandatory Occurrence Report

N

NCASB	National Civil Aviation Safety Board

S

SDCPS	Safety Data Collection and Processing System
SMD	Aviation Safety Management Department
SMS	Safety Management System
SSP	State Safety Programme

T

TASAP	Thailand Aviation Safety Action Plan
TAWS	Terrain Avoidance Warning System
TCAS	Traffic Collision Avoidance System
TCAS TA	TCAS - Traffic Advisory
TCAS RA	TCAS - Resolution Advisory

V

VOR	Voluntary Occurrence Report

List of Figures and Tables

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COMMITTED TO SAFETY
IN EVERY MOMENT