UK Civil Aviation Authority

Annual Safety Review 2022

CAP 2590

Published by the Civil Aviation Authority, 2023

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First published 2023

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The latest version of this document is available in electronic format at: www.caa.co.uk/CAP2590

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Definitions

MOR = Mandatory Occurrence Reports. Reporting safety-related events which are reported to the CAA which relate to incidents considered as reportable.

Serious Injury = An injury sustained by a person in a reportable accident which requires hospitalisation for more than 48 hours.

Fatality = An injury which results in death from the reportable accident, or up to 30 days after the reportable accident.

For the purposes of this document[1], a fatal or serious injury is defined as an occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such a time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which: a person is fatally or seriously injured as a result of: being in the aircraft, or direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or direct exposure to jet blast, except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew.

If the fatality occurs to persons outside the aircraft, then these are treated as third party fatalities and are not always reportable to the CAA. Occupational health and safety related occurrences are reported to and investigated by Health and Safety Executive (HSE).

Serious Incident = An event where there was a high probability of a reportable accident associated with the operation of the aircraft. The International Civil Aviation Organisation (ICAO) defines that the *difference between a reportable accident and a serious incident lies only in the result*.

Reportable Accident = An event associated with the operation of an aircraft resulting in fatal or serious injuries or significant damage to the aircraft.

[1] Annex 13 - Aircraft Accident and Incident Investigation (icao.int)

Types of Flight

General Aviation = Private flights conducted not for hire and reward and predominantly carried out on small aircraft types.

Business Aviation = Flights conducted predominantly on small jets on types with a small number of seats (generally 20 or fewer) where this is privately owned.

Military = Flights conducted by UK or other state military services. This is not overseen by the CAA.

Commercial Air Transport = Flights conducted for hire and reward purposes where a check-in desk is present at the airport.

Introduction

This Annual Safety Review for the United Kingdom is compiled by the Safety Intelligence Team of the UK Civil Aviation Authority (CAA). It presents the safety performance of UK civil aviation to the end of 2022. Data is subject to change as ongoing investigations are completed. This review is prepared using MOR data collected in accordance with UK EU 376/2014. MORs within scope are ones that have been reported to the CAA and have occurred in or outside the United Kingdom involving UK registered aircraft and involve non-UK registered aircraft in UK airspace.

UK airspace and UK airlines are among the safest in the world. There has not been a fatality on a commercial airline in the UK since 1989. Even with this success, we are not complacent; Government is committed, through the UK state safety system, to maintaining and improving the high safety standards in aviation.

Use of MORs

Internally, we perform statistical analysis to primarily support the UK's State Safety Programme (SSP) and subsequently inform oversight regulatory actions and interventions, policy decisions and safety promotion. More specifically we perform:

- Descriptive analysis of MOR event types and occurrence category analysis by aviation sector in support of risk-based audit activities.
- Specific risk analyses in support of the regulatory safety management system.
- Monitoring of safety performance indicators to identify trends and patterns and inform safety risk management.

We also respond to external MOR data requests submitted through SRG1605 and SRG1604 forms.

In 2022, the majority of requests we received concerned data analysis for RPAS operations, bird strikes and rotary wing related events. These were predominately from industry, academia, and government bodies. There were also technical specific requests on occurrence categories and event types submitted by aviation organisations in support of their safety programmes and management systems.

We also publish number of reports every year based on the aviation safety data we collect. Areas covered include:

- Birdstrikes
- Laser strikes

Finally, analysis of MORs informs the development of safety promotion material such as CAA publications, podcasts, leaflets and other products. These aim to raise awareness about key risk areas, and seasonal events and high severity occurrences. Furthermore, investigation findings and outputs of severe occurrences that lead to the identification of causal factors and root causes also contribute to the development of bespoke safety publications. Examples of such publications can be found:

- Mandatory Occurrence Reports
- The Importance of Occurrence Reports
- GA Unit – Just Culture
- Airspace & Safety Initiative
- Air Safety Support International

At the CAA, handling, processing, and investigation of MORs sometimes involves several different business areas who may have an interest in the event from different perspectives, such as the type of aircraft flown, the location or the type of event. For the purposes of this document individual MORs may be featured in more than one business area.

The analysis of data presented in this Annual Safety Review may differ from reports published by other organisations and regulators. This is a result of different data collection methods and analysis used to interpret the data. This includes year on year changes to data from historic CAA reports and publications. Each report has its own merits and contributes to the analysis and data landscape of safety reporting.

General Aviation (GA)

The UK GA sector covers around 17,000 aircraft (mainly with a maximum take-off mass below 5,700kg), including specialist activities such as pilot training, balloon operations, gliding, ex-military aircraft operations, parachuting and air displays. Overall, while the risk associated with GA is greater than commercial aviation, the safety level of GA in the UK is still acceptable given the nature of activity undertaken.

The CAA's GA Unit exists to help people from potential harm when they encounter GA, and our team is committed to delivering protection now and in future as effectively and efficiently as possible. The unit is responsible for safety promotion activities aimed at the GA industry including podcasts, safety animations, a variety of safety publication, including the SkyWay Code and series of Safety Sense Leaflet as well as and attending GA community events.

Owners and/or operators of close to 11,000 UK GA aircraft (of which ~60% were aeroplanes according to data from the UK aircraft register) reported approximately 700,000 hours in 2022. This activity remains below pre-pandemic levels, with flying hours in 2022 being 14% below 2019 levels.

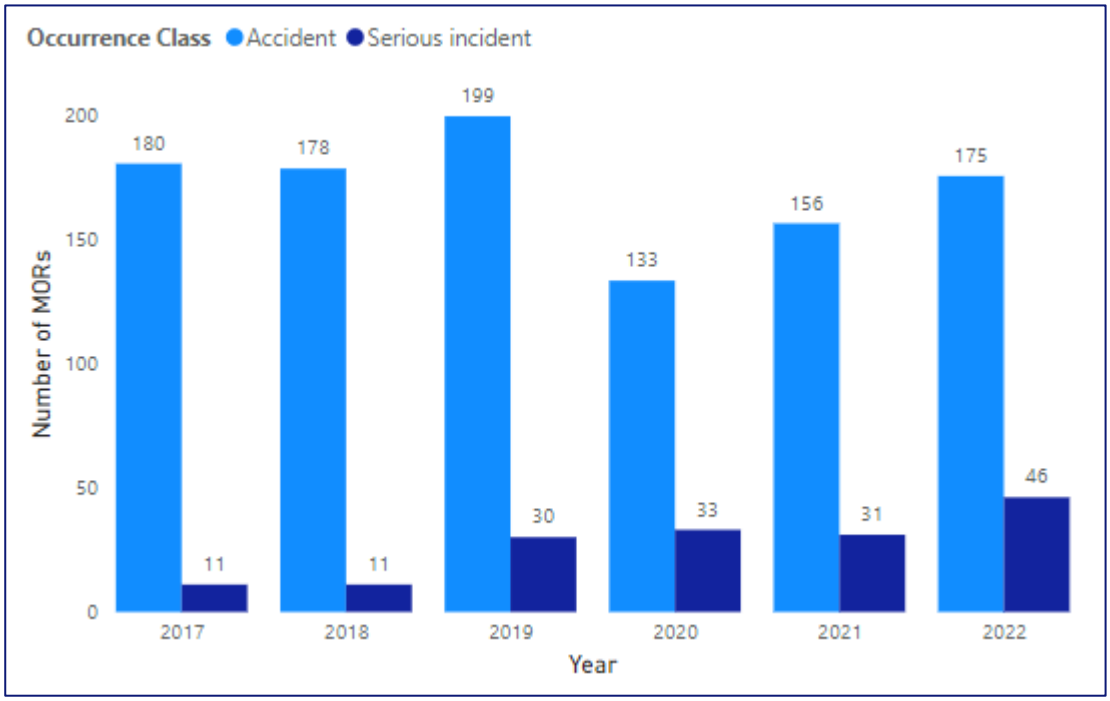
In 2022 the CAA received over 2,000 GA related occurrence reports, of which around 10% were classified as reportable accidents or serious incidents (high severity occurrences). Many of the reportable accidents and serious incidents are reported to and investigated by the Air Accident Investigation Branch (AAIB) and some are still under investigation.

There were 221 reportable accidents and serious incidents involving GA aircraft in 2022, of which 88% resulted in no injuries (this is similar to the previous five-year average). However, 8 reportable accidents that occurred during this time caused 11 people to sustain fatal injuries (including one case where a qualified pilot died during flight). There were also 18 reportable accidents which resulted in serious injuries to people.

Reportable accidents and serious incidents in 2022 largely involved aeroplanes and were mostly attributed to an obstacle (tree, hedge, fence, etc) as a result of hard/heavy landings or long/fast landings. In 2022, statistically more microlight aircraft were involved in serious injury reportable accidents compared to other aircraft classes.

The graph below gives a visual representation of reportable accidents and serious incidents in the GA sector in the years between 2017 and 2022.

GA Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	180	11
2018	178	11
2019	199	30
2020	133	33
2021	156	31
2022	175	46

Scheduled Commercial Air Transport (CAT)

Scheduled CAT accounts for the majority of passenger and cargo flights in the UK. This sector consists of airlines operating large fixed-wing jet aircraft and is the most common way the public interact with the aviation system.

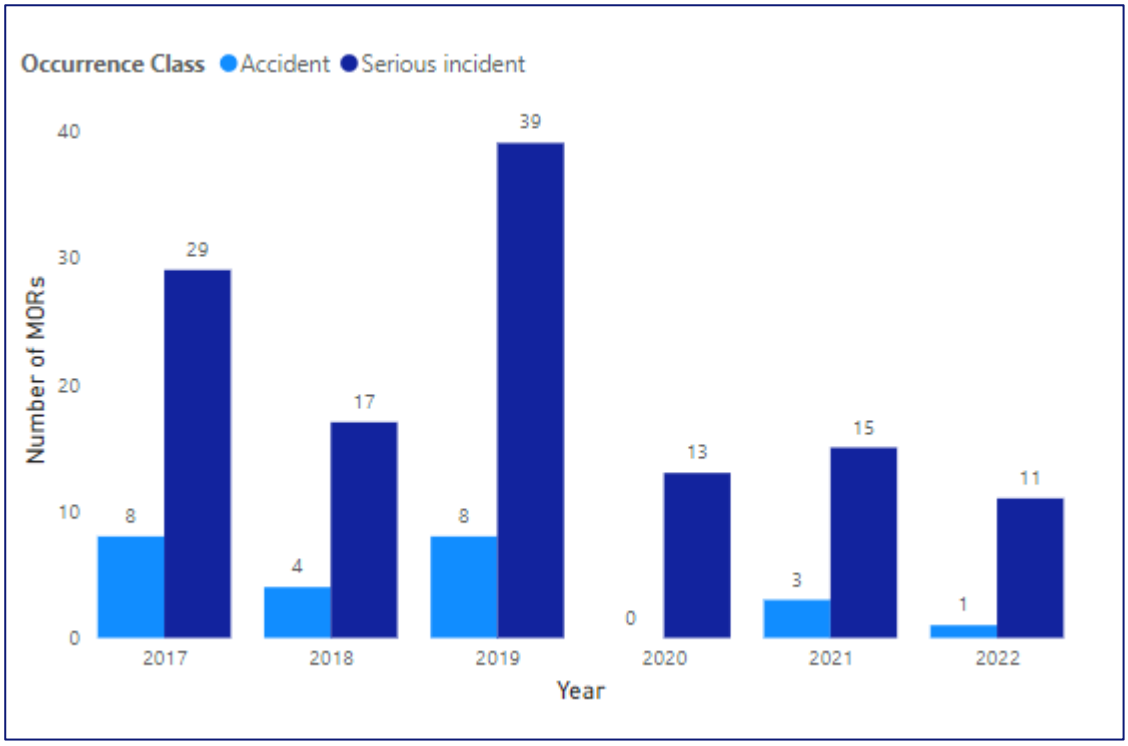
In 2022 this sector flew over 106 million passengers and approximately 950,000 tonnes of cargo on just over 820 thousand flights. This is still the below pre-pandemic level where in 2019, this sector operated over 1 million flights and carried over 140 million passengers per year.

In 2022 there was 1 reportable accident and 11 serious incidents, and no fatal or serious injuries were reported. The single reportable accident MOR involved multiple system abnormalities in flight.

The majority of reportable accidents and serious incidents occurred within the UK (75%) which follows the same trend in 2021. The most common identified cause was due to technical malfunction of the aircraft. This identified cause aligns with previous years data.

The graph on the page below gives a visual representation of reportable accidents and serious incidents for scheduled CAT in the years between 2017 and 2022.

Scheduled CAT Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	8	29
2018	4	17
2019	8	39
2020	0	13
2021	3	15
2022	1	11

Non-Scheduled Commercial Air Transport

Non-scheduled CAT covers a variety of related flight operations. Including various corporate flights, air taxi and aerial works.

The main difference from the scheduled sector is that aircraft in the non-scheduled area are smaller with fewer or no passengers and they do not operate to a set timetable.

The safety issues and risks of these operations are like the ones in scheduled operations.

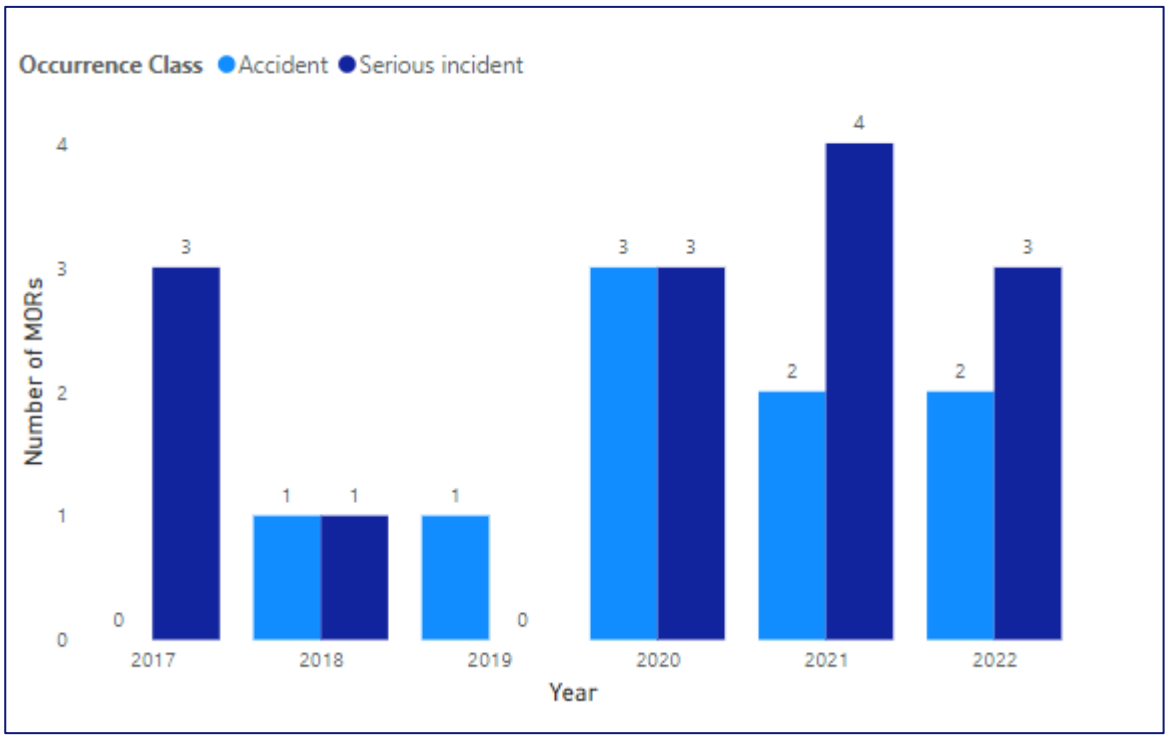
UK non-scheduled CAT sector involves close to 30 operators with approximately 28,000 flights in 2022.

In 2022 there were two reportable accidents and three serious incidents. This is like 2021 but more than pre-pandemic levels. There have been no fatal or serious injuries in the past five years.

The main causes for reportable accidents and serious incidents in 2022 were related to landing gear issues, aircraft handling and extreme weather conditions.

The graph on the page below gives a visual representation of reportable accidents and serious incidents for non-scheduled CAT in the years between 2017 and 2022.

Non-Scheduled CAT Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	0	3
2018	1	1
2019	1	0
2020	3	3
2021	2	4
2022	2	3

Vertical Take off and Landing (VTOL)

The VTOL sector within Airworthiness is responsible for the oversight of rotorcraft and Urban Air Mobility aircraft. We oversee a vast array of organisations from training schools, Commercial Air Transport, Search and Rescue to Police and Helicopter Emergency Medical Services operations, each organisation and operation brings with it a different set of complexities which we oversee with our oversight programme to ensure that the VTOL sector remains safe and compliant.

Currently, we are entering into an exciting time of development within the vertical aviation sector. One of the key items we are looking at is how best to engage with industry to ensure the continued safe handling and use of critical parts on vertical aviation systems.

'Improving safety and ensuring compliance in vertical aviation is paramount to the safe operation of industry within the UK.'

We also remain vigilant to the risks within our sector, and we monitor the data from industry, both foreign and UK reports so that we capture emerging risks and continue to lower/mitigate these risks in conjunction with relevant National Authorities and UK operators, it is therefore paramount that operators continue to report through the occurrence reporting system in alignment with their Safety Management System.

Onshore helicopter operations predominantly involve emergency medical services, law enforcement, search and rescue missions, and corporate transport. The operational environment is relatively controlled, with established helipads and infrastructure. The local economies benefit from these services, particularly in remote areas where access by road might be limited. There are approximately 50 onshore helicopter operators that have been granted an Air Operators Certificate (AOC) and approximately 100 helicopters carrying out combined commercial special operations and non-commercial operations in the UK.

Offshore helicopter operations, on the other hand, cater to the needs of the energy industry. These operations require specialised skills due to the challenging maritime environment. Helicopters transport personnel to and from offshore platforms, often navigating adverse weather conditions, demanding precise flight planning and execution.

The offshore helicopter industry contributes significantly to the UK economy, as it supports the offshore energy sector – a vital source of energy to the UK. The smooth operation of offshore helicopters is crucial to maintaining production levels and ensuring the energy supply. There are approximately 100 helicopters used in the support of offshore operations, spread between 5 Air Operators.

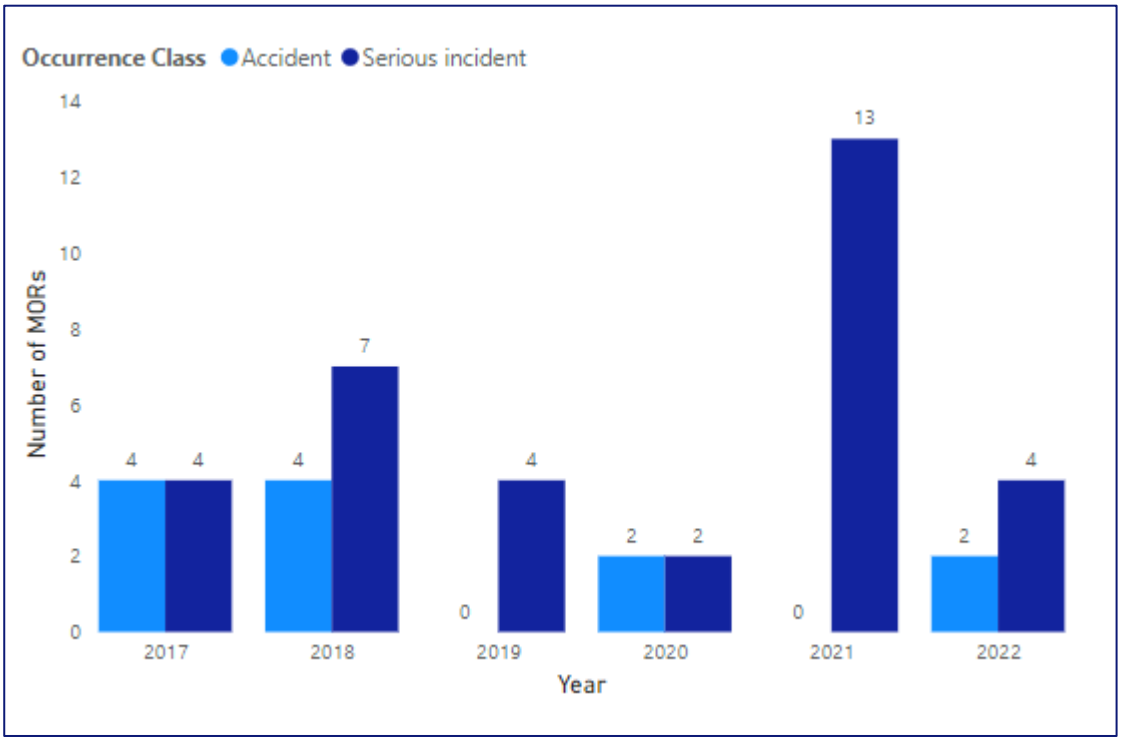
In absolute numbers, there were less serious incidents in 2022 compared to the previous year however there were more reportable accidents. One of the reportable accidents resulted in one fatal and one serious injury.

Within the VTOL sector the main causes for reportable accidents and serious incidents in 2022 were related to system/component failures, medical events and navigation errors.

The distribution of serious incidents between onshore and offshore operations is almost equal for 2022 (3 onshore vs 1 offshore). This falls in line to what has been observed in previous years.

The graph below gives a visual representation of reportable accidents and serious incidents related to helicopters in the years between 2017 and 2022.

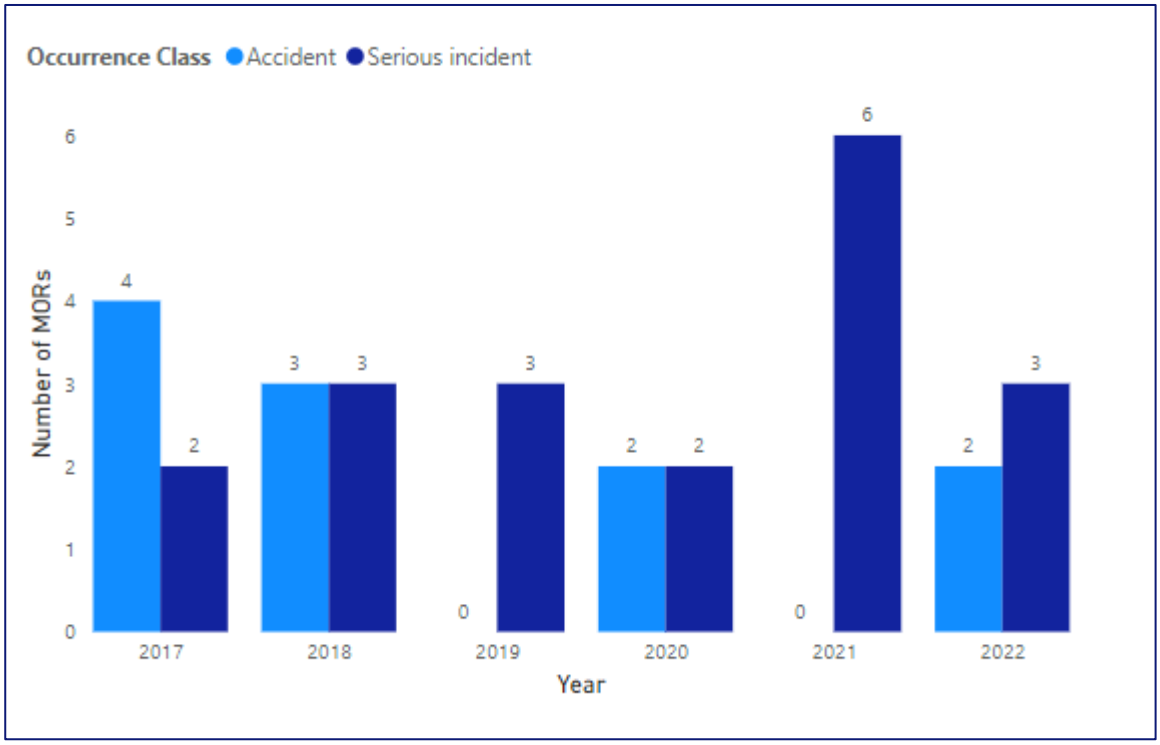
Helicopter Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	4	4
2018	4	7
2019	0	4
2020	2	2
2021	0	13
2022	2	4

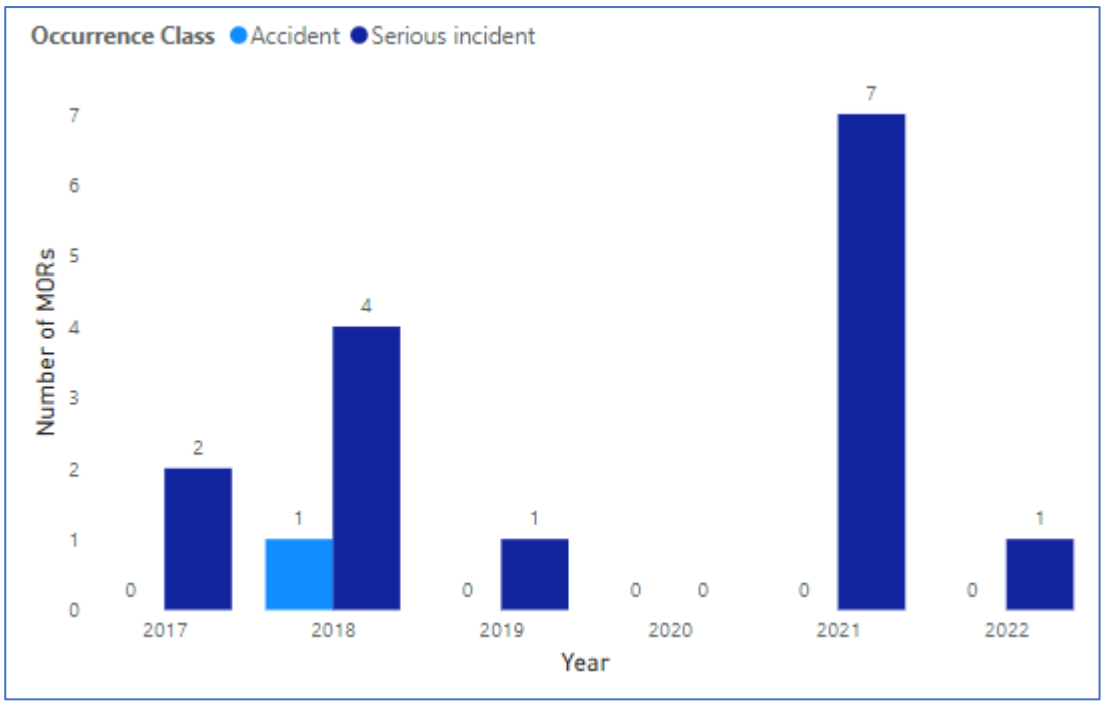
The graph below gives a visual representation of reportable accidents and serious incidents related to onshore vs offshore helicopters in the years between 2017 and 2022.

Onshore Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	4	2
2018	3	3
2019	0	3
2020	2	2
2021	0	6
2022	2	3

Offshore Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	0	2
2018	1	4
2019	0	1
2020	0	0
2021	0	7
2022	0	1

Remotely Piloted Aircraft Systems (RPAS)

The use of drones and model aircraft continues to grow as new technologies and capabilities are introduced. As of 31st March 2023, there are 513,860 active registered drone flyers and operators – which consists of:

- 215,140 Active Operators: of which 6,275 are Organisations and 208,865 are Individuals
- 298,720 Active Flyers: of which 5,917 are under 13 and 292,803 are aged 13+
- 14,638 Active Remote Pilot Competency Qualification Holders
- 3,620 Active Specific Category Operational Authorisation Holders
- 30 Active Recognised Assessment Entities
- 3 Independent Flying Associations

In December 2022, the CAA published an updated version of CAP 722: guidance and policy on the operation of unmanned aircraft systems within the UK. A full list of RPAS CAA publications is available on our website.

There were 80 accidents/serious incidents involving RPAS reported to the CAA during 2022. This is a decrease from 2021 where 129 reportable accidents/serious incidents were reported.

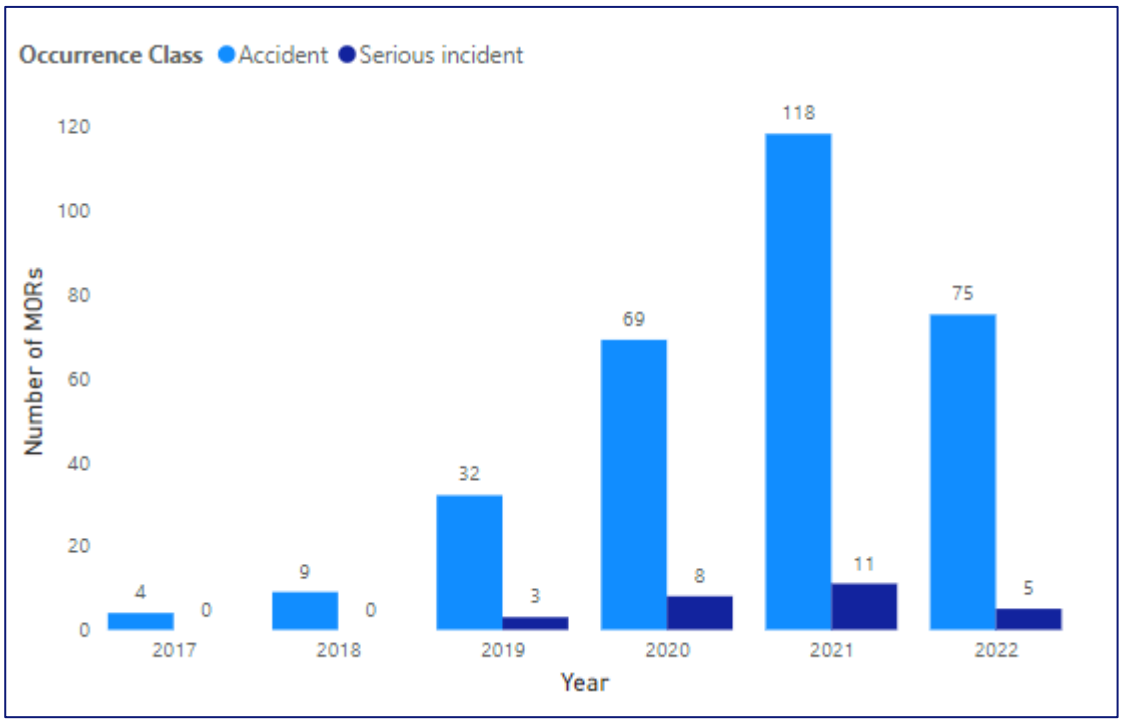
In 2022, 50.6% (41) of reportable accidents and serious incident MORs were reported as loss of control incidents. This was the most frequently reported MOR category in 2022, and between 2017 and 2021 where loss of control accounted for 52.7% (168) of high severity occurrences. System or component failure was the second most frequently reported high severity occurrence in 2022 (21% of these MORS) and the five years prior (23.8%).

In 2022 there were no fatal or serious injuries reported, and this is the same as the previous five years. All RPAS reportable accidents and serious incidents are required to be reported to the AAIB, regardless of weight of the drone or if they are being used for commercial purposes.

Between 2017 and 2022, there were 334 high severity occurrences involving RPAS reported to the CAA, an average of 56 per year.

The graph below gives a visual representation of reportable accidents and serious incidents related to RPAS in the years between 2017 and 2022.

RPAS Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	4	0
2018	9	0
2019	32	3
2020	69	8
2021	118	11
2022	75	5

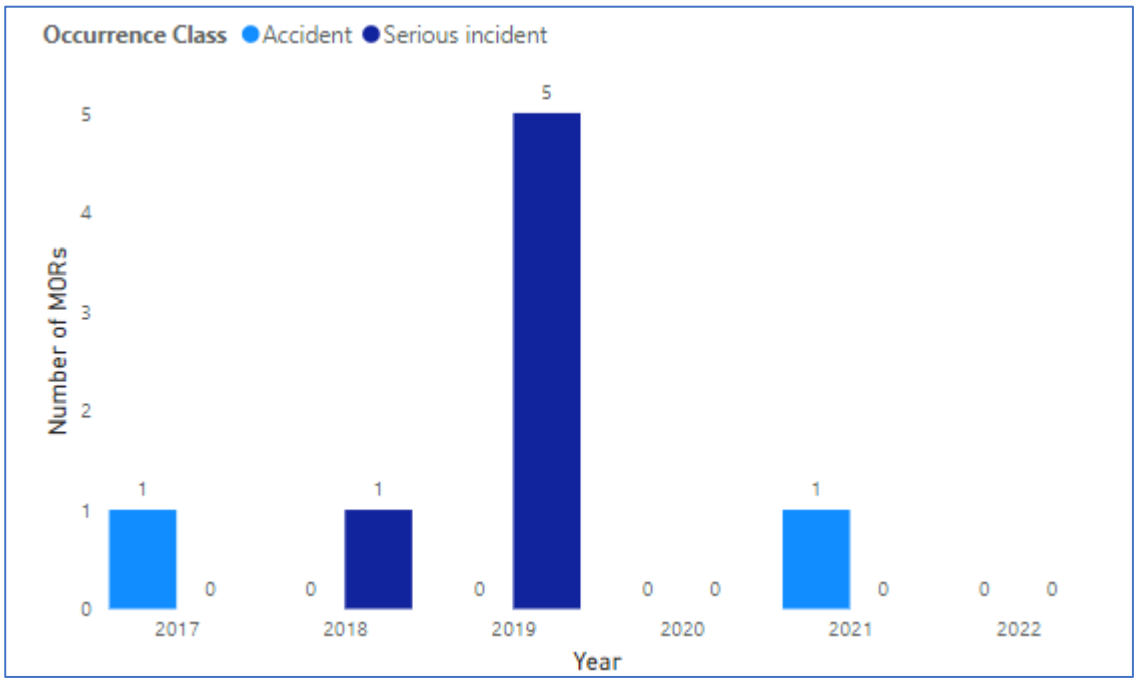
Air Traffic Management/Air Navigation Services (ATM/ANS)

This section includes reportable accidents and serious incidents with an Air Traffic Management/Air navigation services (ATM/ANS) involvement that occurred within UK airspace. The involvement of ATM/ANS in an occurrence does not imply that ATM/ANS were at fault or the cause of the MOR.

The types of MORs which may be classed as related to ATM/ANS include mid-air conflict, runway incursions, losses of separation, airspace infringements, Air traffic control engineering problems and difficulties with communication.

The graph below gives a visual representation of reportable accidents and serious incidents related to the provision of ATM/ANS in the United Kingdom between 2017 and 2022.

ATM/ANS Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	1	0
2018	0	1
2019	0	5
2020	0	0
2021	1	0
2022	0	0

In 2022 there were no MORs reported to the CAA classed as a reportable accident or serious incident involving ATM/ANS. There were no reportable accidents reported under ATM/ANS in 2022, the last reportable accident reported was in 2021.

Injuries and fatalities

There were no MORs involving serious injuries or fatalities reported under ATM/ANS in 2022, the last fatal reportable accident with ATM/ANS involvement occurred in 2021.

Aerodromes

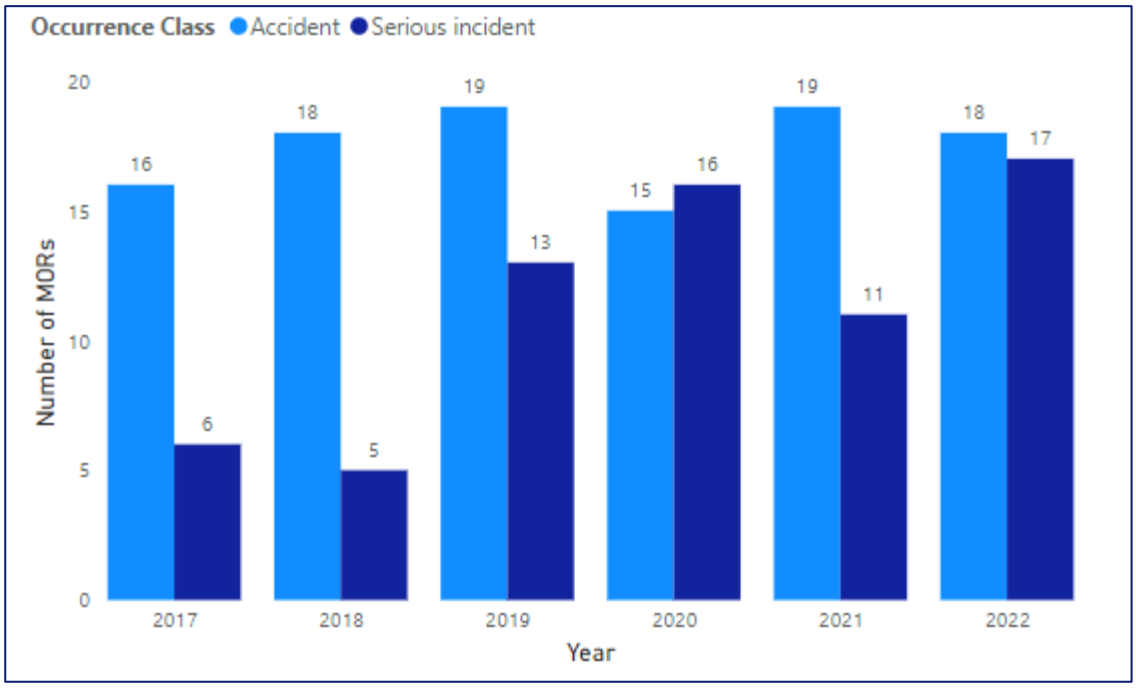
This section includes reportable accidents and serious incidents with an aerodrome involvement at UK certified and licensed aerodromes, involving civil aircraft. A list of the aerodromes that hold a UK Certificate and UK Licenced Aerodromes are available on the CAA's website.

An aerodrome occurrence may be described as those involving an aerodrome's infrastructure, or personnel working at the aerodrome (although they may be employed by a third party such as a ground handler or an airline). Events such as technical malfunctions on aircraft are only included if there are factors directly related to the aerodrome that influence the outcome of the occurrence. Security events are not covered by this document, therefore events such as bomb threats and stowaways have been excluded. The involvement of an aerodrome in an occurrence does not imply that the aerodrome was at fault or the cause of the MOR.

The types of MORs which may be classed as related to aerodromes include runway excursion, abnormal runway contact, loss of control – ground, ground collision, collision with obstacle during take-off and landing and ramp/ground handling.

The graph below gives a visual representation of reportable accidents and serious incidents related to aerodromes in the years between 2017 and 2022.

Aerodrome Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	16	6
2018	18	5
2019	19	13
2020	15	16
2021	19	11
2022	18	17

In 2022 there were 35 MORs reported to the CAA classed as a reportable accident or serious incident relating to aerodromes, 18 are classed as reportable accidents and 17 are classed as serious incidents. Some of the top reasons for report of accidents and serious incidents in 2022 are runway excursion, ground collision and loss of control – ground.

The number of reportable accidents related to aerodromes has remained consistent between 16-19 per year for the last 6 years. There number of serious incidents related to aerodromes in 2022 is higher than in previous years at 17.

Injuries and fatalities

There were no reportable accidents resulting in serious injury reported to the CAA in 2022, the last reportable accident MOR received in 2021.

There were no MORs relating to reportable accidents resulting in fatality between 2017 and 2022 at UK certified or licenced aerodromes. If the injury or fatality occurs to persons outside the aircraft, then these are treated as third party injury or fatalities and are not always reportable to the CAA, occupational health and safety related occurrences are reported to and investigated by HSE. Please see definitions for more details.

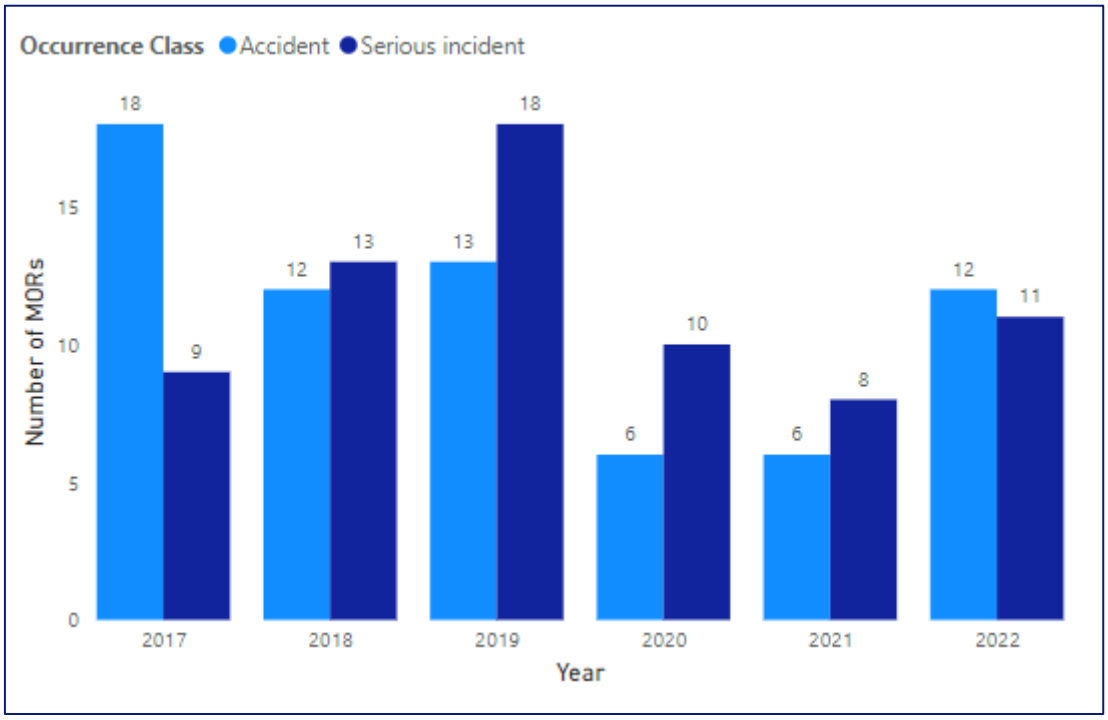
Non-UK Operators in UK Airspace

The below chart displays the number of reportable accidents and serious incidents, by year. 2022 was lower on reportable accidents and serious incidents than pre-pandemic (2019). The reportable accidents in 2022 can be broken down as follows:

6 reportable accidents in 2022 (50%) were during the landing phase of flight. With 1 of the reportable accidents involved a Commercial Air Transport aircraft – ground collision whilst taxiing past a parked aircraft. Both aircraft involved were non-UK registered. There were no injuries.

Despite both reportable accidents and serious incident events having taken place in 2022, none of these resulted in serious injuries or fatalities and has remained at the same level since 2020:

Non-UK Operators in UK Airspace Accidents/Serious Incidents 2017-2022



Year	Reported Accidents	Reported Serious Incidents
2017	18	9
2018	12	13
2019	13	18
2020	6	10
2021	6	8
2022	12	11

Fatalities

The last fatalities were sustained in 2019 with a non-UK operator in the UK.

Serious Injuries

Three of the injuries were sustained within the General Aviation Sector. All of these injuries were sustained whilst the aircraft were landing.