

# ANNUAL SAFETY REPORT 2019



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Swiss Confederation

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# ABBREVIATIONS

## A

AAB *Airprox Analysis Board*  
ACAS *Aircraft Collision Avoidance System*  
AOPA *Aircraft Owners and Pilots Association*  
APU *Auxiliary power unit*  
ASR *Annual safety report*  
AT *Austria*  
ATC *Air traffic control*  
ATM *Air traffic management*  
AVISTRAT-CH *New airspace and aviation  
infrastructure strategy for Switzerland*

## C

CAT *Commercial Air Transport*  
CTR *Control zone*

## D

DETEC *Federal Department of the Environment,  
Transport, Energy and Communications*

## E

EASA *European Aviation Safety Agency*  
ECAC *European Civil Aviation Conference*  
EPAS *European Plan for Aviation Safety*

## F

FOCA *Federal Office of Civil Aviation*  
FZAG *Zurich Airport AG*

## G

GA *General Aviation*  
GNSS *Global Navigation Satellite System*  
GPS *Global Positioning System*

## I

IATA *International Air Transport Association,  
International Air Transport Association*  
ICAO *International Civil Aviation Organisation*  
ID *Innovation and Digitisation*  
IFR *Instrument flight rules*

## R

R/PBO *Risk- and performance-based oversight*  
RPAS *Remotely piloted aircraft system*

## S

SASCON *Swiss Aviation Safety Conference*  
SASP *Swiss Aviation Safety Plan*  
SORA *Specific Operational Risk Assessment*  
SPO *Special Operations*  
SRM *Safety Risk Management*

## T

TMA *Terminal manoeuvring area*  
TMZ *Transponder Mandatory Zones*

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## 1. FOREWORD BY THE DIRECTOR GENERAL

Has safety in aviation really deteriorated, as was reported in a newspaper article last year? We just have to look at the numbers for 2019 to see that this argument holds no weight. Despite the tragic crash of a modern Boeing 737-Max 8 with 157 fatalities, the opposite is true and safety standards in international civil aviation are very high. Although every accident is one too many, flying has become safer and safer for passengers in recent decades. Swiss civil aviation has also seen a fall in the number of accidents in the last five years. We all know that accidents cannot be completely avoided in aviation as a whole, but it is crucial that the long-term trend in light aircraft operations does not worsen either.

Although our Annual Safety Report 2019, which also covers some activities undertaken by the Federal Office of Civil Aviation (FOCA) last year, paints a picture of the past, data from recent years can help us focus our efforts even more effectively on risk- and performance-based oversight in order to prevent future accidents. Our activities are always aimed at reducing risk to an acceptable level through suitable and practicable safety measures. Drawing conclusions from occurrences, but also sharing information with other authorities and industry, helps us achieve our safety objectives. During this process, we consolidate safety issues for oversight of flight operations, technology and infrastructure, which we analyse on the basis of available data. This allows us to focus our risk-based supervisory activities on weaknesses in the system.

I hope this report provides you with a good overview of safety performance in 2019 and of the FOCA's most important activities.

A handwritten signature in blue ink, appearing to read 'Ch. Hegner', with a stylized flourish at the end.

*Federal Office of Civil Aviation, Christian Hegner, Director General, 30 March 2020*

## 2. INTRODUCTION

Thanks to continuous and systematic efforts, civil aviation has achieved a high level of safety to date. Given the dynamic environment, the aviation system must be in a position to identify complex systemic risks and, above all, anticipate the impact of changes.

This Annual Safety Report (ASR 2019) covers the safety projects that the FOCA pursued in 2019 and the incidents that occurred in Swiss civil aviation in the reporting year, by category, and describes how appropriate measures were implemented and the measures planned for the future. It is primarily addressed to players in the aviation sector, but is also accessible to the general public. The four main purposes of the 2019 edition are as follows:

- 1 Providing data and information in accordance with reporting obligations as indicators for Swiss civil aviation
- 2 Measuring the key safety data/achievement of safety objectives in accordance with the mandate from the Federal Department of the Environment, Transport, Energy and Communications (DETEC)
- 3 Assessing risks in selected areas and describing trends
- 4 Describing measures based on occurrence data and obtained findings

This year's report focuses on the FOCA's direct areas of responsibility as supervisory authority (Swiss airspace, Swiss airports and airfields, HB-registered aircraft, Swiss-certified air transport operators). Against this backdrop and in line with the SASP (Swiss Aviation Safety Plan) and EPAS (European Plan for Aviation Safety), it presents data based on the categories of Commercial Air Transport (CAT), Non-Commercial Air Transport (NON-CAT = NC or GA) and Special Operations (SPO) and addresses, where possible, any differences between these categories.

Data analysis in 2019 focused on the safety issues identified by the FOCA's Safety Risk Management (SRM) division, which are assigned to safety risk areas. This procedure aims to create greater transparency around issues that require more attention from the FOCA.

Following the first two chapters (Foreword by the Director General and Introduction), chapter 3 contains a brief description of the most important FOCA projects during 2019. Chapter 4 deals with current safety performance in Switzerland and the rest of the world. Chapter 5 (Systemic issues) deals with the system-related issues of safety promotion and reporting culture. The central component of this report is chapter 6, which provides an overview in chart form of all relevant operational safety issues and related occurrence data for 2019. Chapter 7 contains up-to-date information about drones, U-space, cyber security and jamming of the Global Positioning System (GPS). The report concludes with chapter 8, which evaluates and draws conclusions from the results, and presents an outlook of forthcoming activities relating to safety in Swiss civil aviation.

## 3. FOCA SAFETY-RELATED PROJECTS IN 2019

### 3.1. AVISTRAT-CH project

In 2019, the first important milestone in the AVISTRAT-CH programme (new airspace and aviation infrastructure strategy for Switzerland) was achieved with completion of the process to formulate the vision. The vision paints a picture of a future that encompasses all current and future airspace users. Flexible architecture means that new user requirements and technologies can be integrated much more quickly in the future. In terms of costs, the new system also needs to satisfy high standards of efficiency and transparency. The ultimate goal is to keep the environmental impact as small as possible.

The task in the next phase, “Strategy”, is to work out the best way to achieve the vision, then set out an implementation plan for transforming, step by step, the current system into the future system. Development of the strategy is scheduled for completion by the end of 2021.

### 3.2. Zurich airspace

Zurich Airport is Switzerland’s most important national airport with around 278,000 aircraft movements every year. A safety audit of the airport carried out in 2012 concluded, amongst other things, that because of its complexity, with two control zones (CTR) and 17 terminal manoeuvring areas (TMA), the airspace should be assessed as critical to safety. The terminal manoeuvring areas are particularly at risk of airspace infringements. The last attempt to redesign Zurich’s TMAs was abandoned in 2017 because the return on investment was not proportionate.

DETEC, at the request of Flughafen Zürich AG (FZAG), Skyguide and Swiss instructed the FOCA to relaunch the project. The first phase saw the creation of a new basic airspace structure that encompasses all approach and take-off procedures by instrument flight rules (IFR) for the three runways at Zurich Airport and the runway in Dübendorf. It was a conscious decision to limit the basic design to reflecting only the requirements of IFR traffic. This enabled the stakeholders affected by the redesign to analyse the basic design, assess its impact on their own operations and propose potential solutions by the end of August 2019. Their feedback ranged from negative to cooperative and solution-oriented.

#### 3.2.1. New basic design with higher TMA minimum thresholds

A new design (version 2.0) for the airspace structure has now been prepared on the basis of realistic climb performances of commercial aircraft at a national airport. Although the minimum thresholds for various TMAs are higher in version 2.0 than in the basic design, version 2.0 also only reflects the requirements and protection of IFR traffic.

The FOCA and Skyguide held two events in December 2019 to provide information about version 2.0 of the airspace design to those stakeholders directly affected by the redesign. They also explained in detail how an airspace design is created, what the principles are and why comparisons cannot be made with other international airports and countries. The discussions have shown that although the revised version 2.0 contains improvements from the perspective of stakeholders, it is still viewed critically in some areas.

#### 3.2.2. Information on next steps

A series of meetings between the FOCA/Skyguide and stakeholders has already taken place to jointly compare the comments submitted with version 2.0 of the airspace design. Stakeholders had the opportunity to point out any problems they still had with version 2.0 and any potential solutions they could see. An overview reflecting stakeholders’ fulfilled and unfulfilled requirements should be available by summer 2020. It is anticipated that version 3.0 of the airspace design can then be presented in autumn 2020. The definitive airspace structure is due to be published by the end of 2023 and take effect from March 2024.



### **3.3. EASA Part-M Light and R/PBO oversight**

In releasing a Part-M “Light” guide, the objective of the European Aviation Safety Agency (EASA) is to harmonise general aviation in Europe. The guide introduces, amongst other things, new privileges and additional flexibility in the resolution of findings for operators of general aviation aircraft. EASA has committed to making regulation more flexible. This means less rigid oversight, with national authorities being assessed more flexibly on the basis of risk and performance. The oversight cycle is to become a function of risk and performance (risk- and performance-based oversight (R/PBO)). To achieve this, the agency needs to define relevant indicators for determining risk and performance profiles. A corresponding specialist application is to be used for assessments.

## 4. SAFETY LEVEL

### 4.1. Global safety level

The figures published by the International Air Transport Association (IATA) for 2019<sup>1</sup> indicate an improvement in the global safety level compared with 2018. The all accident rate fell from 1.36 accidents per million flights in 2018 to 1.13 per million in 2019, with one accident per 884,000 flights. In absolute figures, 53 accidents occurred worldwide in 2019 (including 8 fatal accidents with a total of 240 fatalities), compared with 62 accidents in 2018, of which 11 accidents claimed a total of 523 lives.

The hull loss rate for aircraft with jet engines also declined between 2018 and 2019, from 0.18 to 0.15 per million flights. Both the all accident rate and the hull loss rate for 2019 remain well below the five-year average calculated by IATA for 2014 to 2018.

### 4.2. Safety level in Switzerland

A total of 23 accidents<sup>2</sup> were recorded in Switzerland in 2019, which is a slight year-on-year decrease in the absolute number of all accidents. Fatal accidents accounted for 30%, a slight year-on-year decrease. The 7 fatal air accidents in Switzerland in 2019 claimed a total of 11 lives, which is almost 75% fewer deaths than in 2018. The relatively high number of deaths in 2018 was caused by an accident involving a Ju-52 on the Segna Pass (Graubünden canton), which was carrying 20 passengers; in 2019, none of the aircraft had more than four people on board. The number of non-fatal accidents remained the same (16). The following overview shows the trend in accidents and number of fatalities over the last four years.

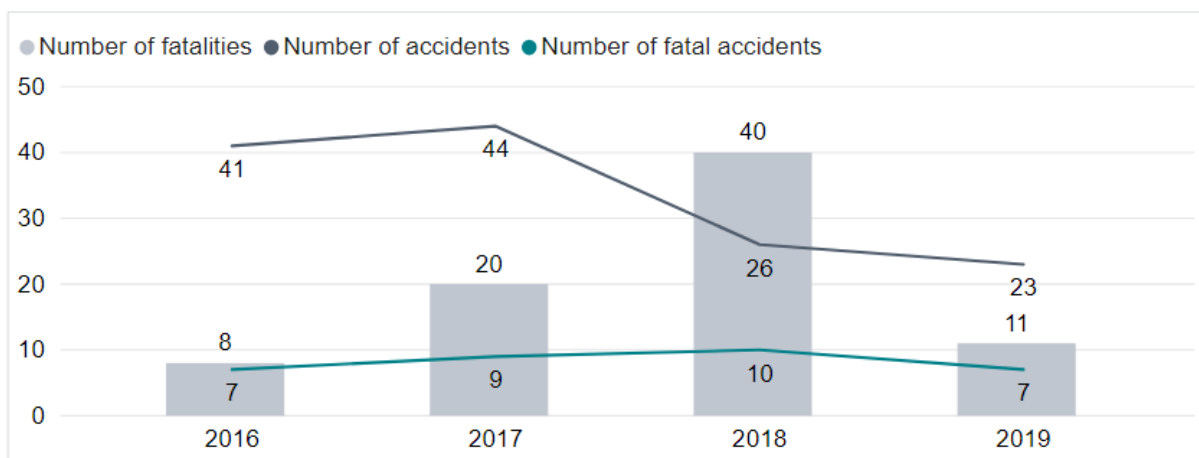


Chart 1: Overview of number of accidents and fatalities between 2016 and 2019

<sup>1</sup> <https://www.iata.org/en/pressroom/pr/2020-04-06-01/> [as at: 21 April 2020]

<sup>2</sup> The figures show all accidents that are known to the Federal Office of Civil Aviation and have been or are being investigated by the Swiss Transportation Safety Investigation Board (STSB) and involve aircraft or Swiss airlines registered in Switzerland, as well as foreign-registered aircraft involved in an accident in Switzerland (source: FOCA ECCAIRS database).

In aviation, a distinction is drawn between commercial and non-commercial operations. Looking at Switzerland's statistics for 2019, without exception all accidents involving fixed-wing aircraft and helicopters fell into the category of non-commercial aviation. Two accidents involved drones (remotely piloted aircraft systems or RPAS). Although these were commercially operated, no one was injured, so the target for commercial air traffic (accidents with fatalities = 0) was achieved in 2019.

## **5. SYSTEMIC ISSUES**

### **5.1. Safety promotion**

In 2019, the FOCA again took advantage of numerous opportunities to provide the Swiss aviation industry with safety-relevant information. For example, the FOCA itself informed stakeholders about projects and important innovations at its own events (incl. Safety Oversight Committee, Swiss Aviation Days, airport manager meetings), while FOCA representatives took part in various safety seminars and industry events (incl. AOPA, Skyguide, Swiss Helicopter Association, Alp Aviation). The topic of safety in aviation was presented after three years at the 2019 edition of the successful SASCON series, with the focus this time on the big data trend. The “Stay Safe” social media channel was used to create awareness amongst the light aircraft operations target group of numerous strategic topics relating to safety, with the issue of drones again featuring prominently in 2019. Following an awareness campaign in 2018, the FOCA produced two videos in 2019 highlighting the risks and dangers of flying drones near airports and airfields or during blue-light operations.

### **5.2. Reporting culture**

Over 6,600 occurrences were recorded in 2019. The multi-year comparison shows a steady improvement throughout Switzerland in the reporting behaviour of people and organisations subject to reporting obligations. There was a year-on-year increase in the number of reports in commercial and non-commercial flight operations and in SPO. The FOCA processed over 10,000 reports (initial reports from several parties involved, follow-up and final reports) in 2019.

Fears that charges brought against air traffic controllers and the associated “Just Culture” discussion might negatively impact the reporting behaviour of air traffic control proved unfounded in 2019. In fact, the number of reports was slightly higher than in the previous year. The nature and quality of individual occurrence reports was not analysed in this context.

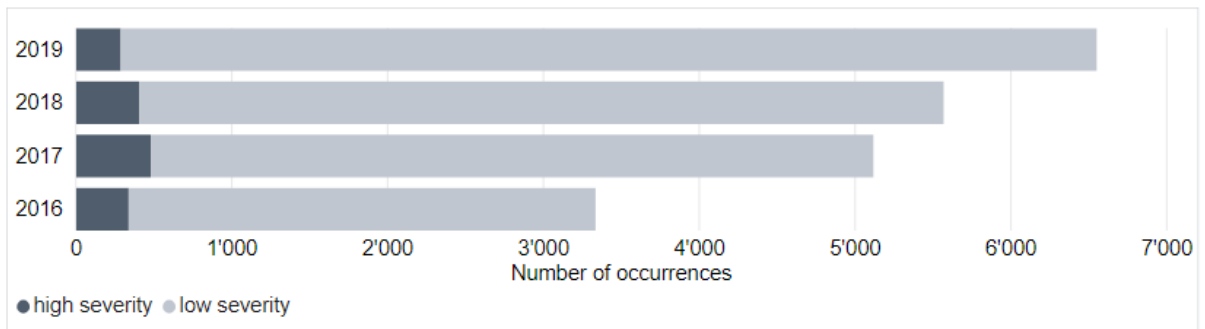
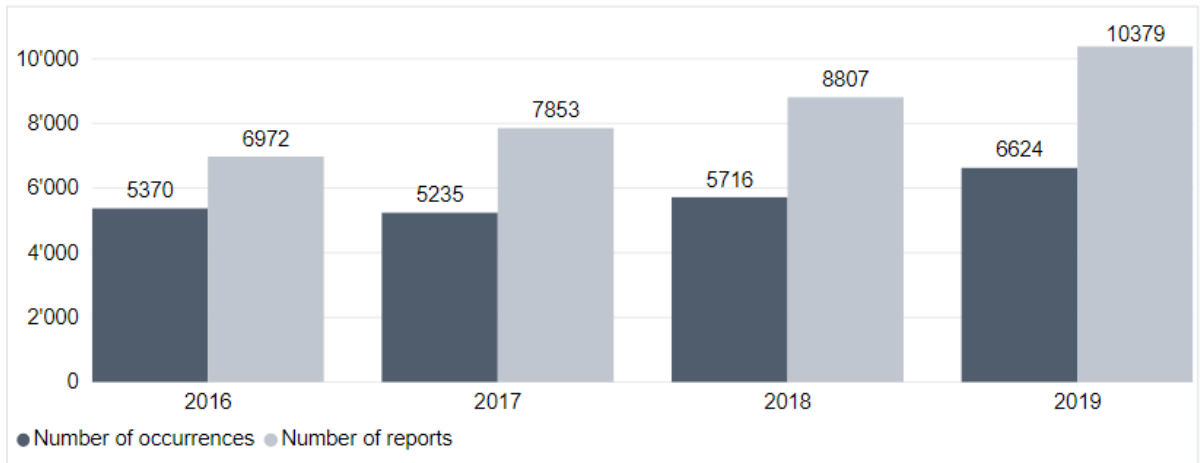


Chart 2: *Development of reporting culture and severity of occurrences in Swiss civil aviation between 2016 and 2019*

## 6. OPERATIONAL ISSUES

In this chapter, operational issues of current relevance to safety in Swiss aviation are discussed. They cover the overarching safety risk areas defined for aviation (see Chapter 6.2) and affect a variety of aviation operations.

During its data analysis process, and taking into account the number of occurrences and their severity, the FOCA identified safety issues in various areas in the reporting year. These were then analysed in detail, given that they could cause accidents in the safety risk areas mentioned above. The FOCA has developed safety indicators to enable it to continuously monitor general trends in the safety risk areas and, where necessary, carry out in-depth analyses and risk assessments. The data examined derive from commercial and general aviation and work flights.

The safety issues identified may vary in the coming years, depending on how trends evolve.

The following sub-chapters describe the safety issues in detail, broken down by operational category as follows:



Aerodrome operations



Air traffic management



Flight operations



Helicopter operations


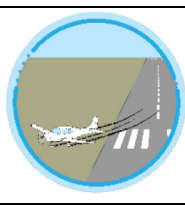


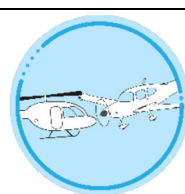
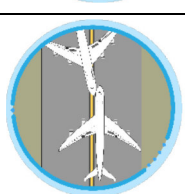
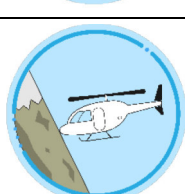
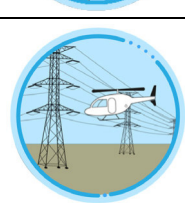


Technical

### 6.1. Structure of sub-chapters

Each operational category contains an overview of the respective safety issues, including their definition and allocation to safety risk areas. This is followed by a chart showing the number of occurrences per safety issue, taking into account average severity. Another chart shows the number of occurrences divided into high/low severity per safety issue. A four-year comparison shows the change over the past four years. Current developments in each safety issue are discussed and – where possible – potential causes are addressed.

## 6.2. Safety risk areas in aviation

	<p><b>Aircraft upset</b></p>	<p>This safety risk area includes uncontrolled collisions with the ground/open terrain, as well as occurrences in which the aircraft deviates from the planned flight path or planned flight parameters, regardless of whether the aircraft crew notices the deviation or not. The causes can be of a technical, handling and/or operational nature.</p>
	<p><b>Runway excursion</b></p>	<p>These occurrences are usually caused by weather conditions (strong tail wind, slippery runways), technical defects or human error.</p>
	<p><b>Injuries and damages</b></p>	<p>This safety risk area includes occurrences that cannot be allocated to the other safety risk areas but have caused damage or injury.</p>
	<p><b>Runway collision</b></p>	<p>(Near)Collision between two aircraft on the runway and occurrences where runways, including the protected area, are entered or used without permission by an aircraft, vehicle or person.</p>
	<p><b>Airborne collision</b></p>	<p>Mid-air collision between aircraft.</p>
	<p><b>Ground collision (off runway)</b></p>	<p>A taxiing aircraft is involved in a (near)collision with another aircraft, vehicle, person or other obstacle in its path.</p>
	<p><b>Terrain collision</b></p>	<p>The aircraft is unintentionally flown into the ground under control. Typically, the crew notices the impending crash too late.</p>
	<p><b>Obstacle collision</b></p>	<p>The aircraft collides with an obstacle (e.g. power line) during flight.</p>

## Your guide to the following sub-chapters

### Definition: Safety Risk Areas

These categories were previously called accident categories. The FOCA has expanded this term in line with EASA and it now means safety-relevant risk areas, initially at an operational level.

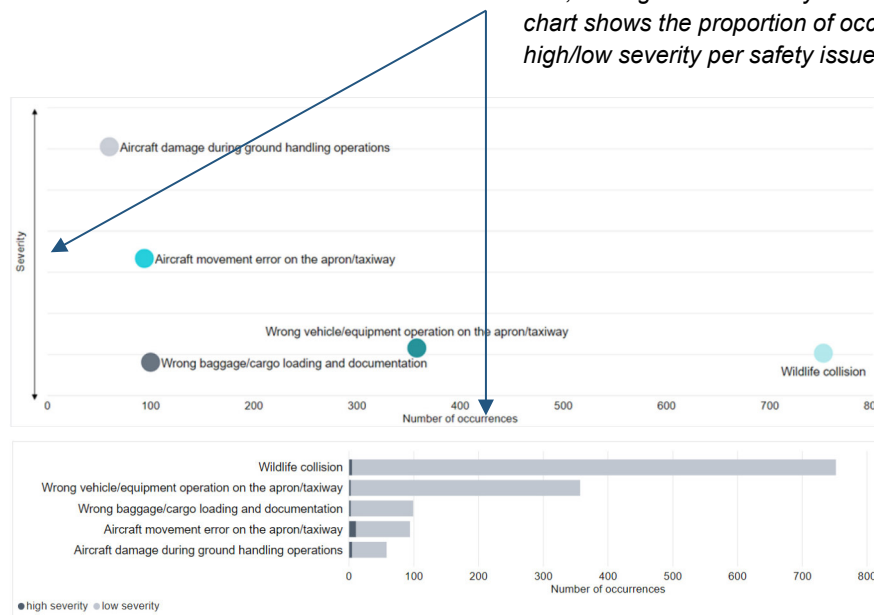
### Definition: Safety issues

Group of occurrences in a given area – in this example “Aerodrome operations”. A safety issue, depending on its impact, can lead to an accident in one of the identified safety risk areas – the potential accident is marked in the table with a dot per safety issue and allocated to the appropriate safety risk area. Safety issues are defined by the number of occurrences and their severity.

Safety issues Aerodrome operations	Safety Risk Areas			
	Aircraft upset	Runway excursion	Injuries/damages	Ground collision (off runway)
Aircraft damage during ground handling operations	•			
Wrong baggage/cargo loading and documentation	•	•		
Wildlife collision	•	•		
Aircraft movement error on the apron/taxiway (own power)			•	•
Wrong vehicle/equipment operations on the apron/taxiway			•	•

### Chart: Number and severity of occurrences

This gives an overview of safety issues by number of occurrences (X axis) and average severity (Y axis), where the higher the dot on the Y axis, the higher the severity. The subsequent chart shows the proportion of occurrences with high/low severity per safety issues.



### Definition: Severity

The FOCA analyses each individual occurrence and assesses its severity on the basis of the available information.

High severity: Accident, serious or major incident

Low severity: Occurrences classified as significant/no safety impact/not determined.



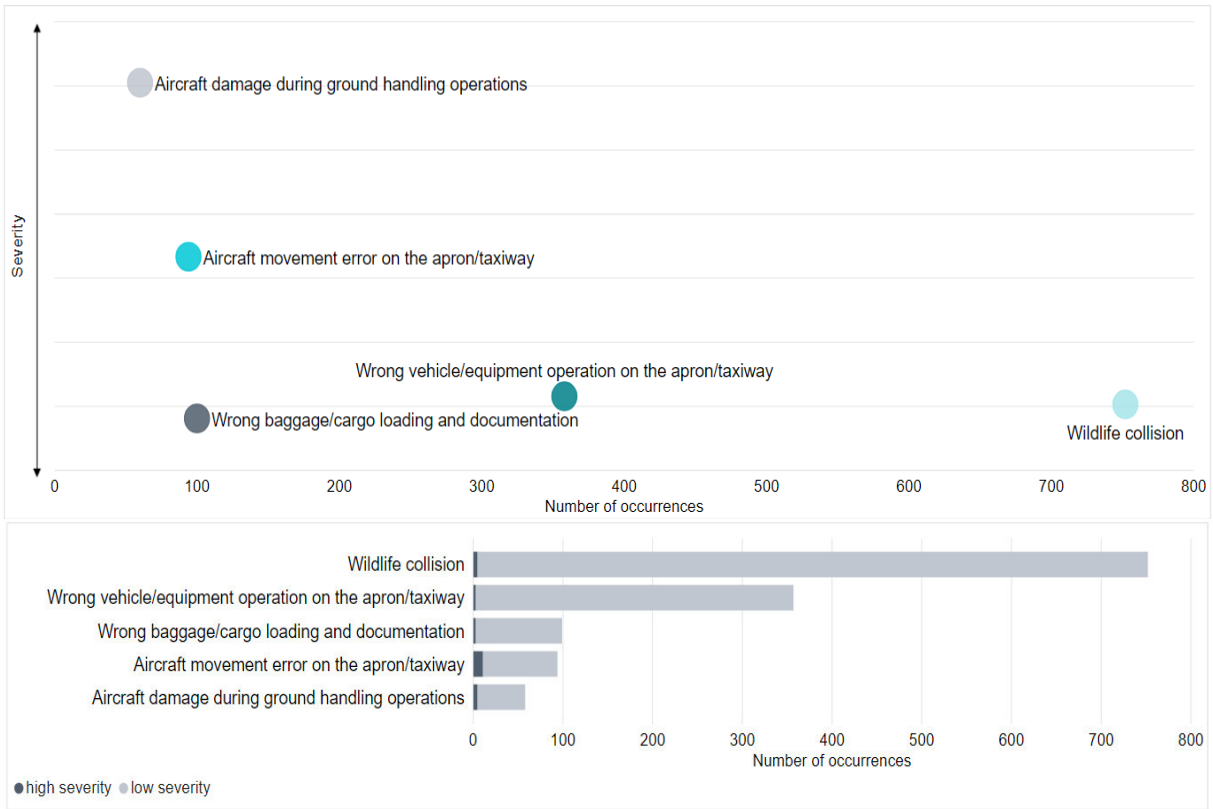
### 6.3. Aerodrome operations

This chapter deals with safety issues in aerodrome operations. An aerodrome is defined as a specific facility for the arrival and take-off of aircraft, for their stationing and maintenance, for the transport of passengers and for the handling of goods. For the purposes of this report, aerodrome operations include all safety-related activities carried out by the airport operator or a third party, including airport infrastructure maintenance, wildlife management, winter services and aircraft handling.

#### 6.3.1. Safety issues in aerodrome operations

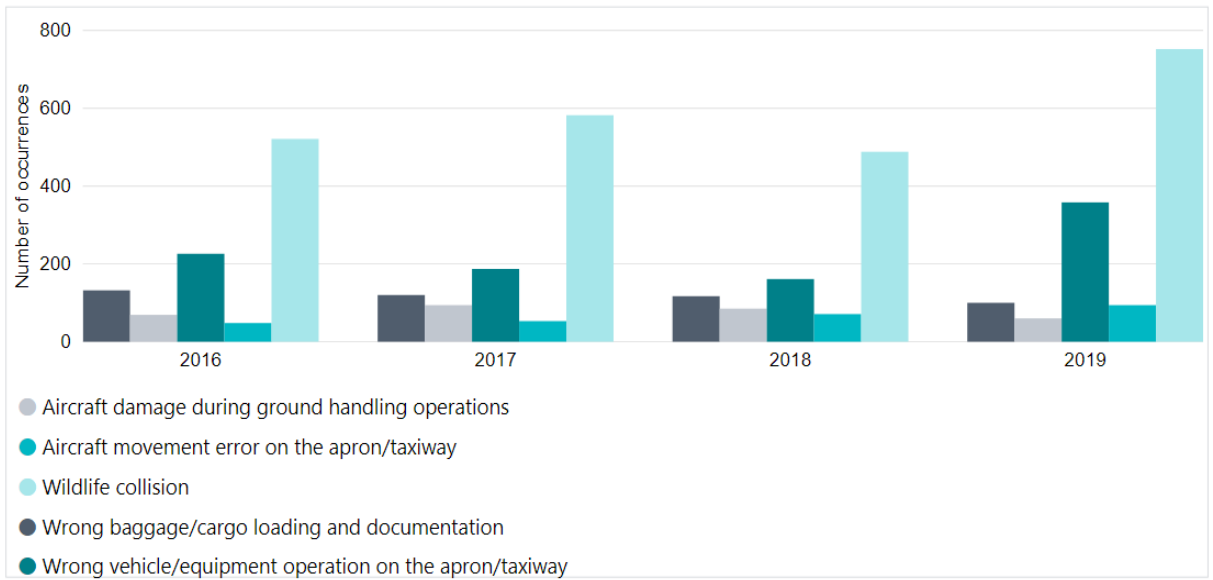
<b>Aircraft damage during ground handling operations</b> A stationary aircraft is damaged during ground handling; collision with equipment/vehicle, faulty manipulation (e.g. incorrect opening of cargo hold doors). Damage may compromise operational safety in flight. This does not include damage caused by foreign bodies.	Safety Risk Areas			
	Aircraft upset	Runway excursion	Injuries/damages	Ground collision (off runway)
<b>Wrong baggage/cargo loading and documentation</b> An aircraft is not loaded by the ground handling staff in accordance with the instructions or is loaded on the basis of incorrect rules. The loading plan is incorrect; wrong take-off weight, balance calculation, flight parameters. Aircraft is loaded incorrectly; cargo may shift in flight. Loading errors can compromise operational safety in flight. This does not include the loading of dangerous goods or an assignment error at the check-in counter.				
<b>Wildlife collision</b> Bird strike or collision with an animal during approach or take-off. The collision may cause damage and/or compromise flight safety. This does not include animal sightings and carcass finds that cannot be unequivocally attributed to a collision.				
<b>Aircraft movement error on the apron/taxiway (own power)</b> The crew deviates from the taxiing rules when taxiing on the apron, which results in an unintentional airprox or a collision with another aircraft, vehicle or obstacle. This does not include movement errors or collisions on the runway.				
<b>Wrong vehicle/equipment operations on the apron/taxiway</b> A vehicle deviates from the instructions/traffic rules on the apron, which results in an unintentional airprox or a collision with a rolling or repelled aircraft. Equipment or vehicles are parked incorrectly on the apron and obstruct a taxiing aircraft. This does not include movement errors on the runway or a collision between a vehicle/equipment with another object/vehicle.				

**Overview of safety issues in “Aerodrome operations” – number and severity of occurrences**



**Chart 3: Overview of number and severity of occurrences in “Aerodrome operations” safety issues**

**Number of occurrences in “Aerodrome operations” safety issues in last four years**



**Chart 4: Number of occurrences in “Aerodrome operations” safety issues in last four years**

## **6.3.2. Data analysis of “Aerodrome operations” safety issues**

### ***Aircraft damage during ground handling operations***

In 2019, 60 occurrences were recorded in which commercially operated aircraft were damaged due to incorrect handling of equipment or vehicles in Switzerland and abroad. Just over half of the occurrences occurred during ground handling operations at a Swiss airport. Fewer than 10% of occurrences were classified as serious because of structural damage. Tight space on the stands combined with carelessness by ground handling staff led to collisions between equipment and a parked aircraft. The number of such occurrences remains comparatively high, but 2019 saw a decrease in the proportion of damage that went undetected before take-off.

### ***Wrong baggage/cargo loading and documentation***

The FOCA received almost 100 reports in 2019 relating to loading errors. Slightly more than a third of occurrences were due to incorrect loading of commercially operated aircraft in Switzerland. Three percent of occurrences were classified as serious because flight operations were affected. The number of reported occurrences was double the previous year’s figure. The reason for this doubling has yet to be determined.

### ***Wildlife collision***

In 2019, the FOCA was notified of just over 750 collisions between commercially operated aircraft and wildlife, primarily birds. Fewer than 1% of occurrences had to be classified as serious, and only a few occurrences caused damage or impacted operations. Of the occurrences reported in 2019, almost 330 occurred in Switzerland, with peaks occurring, as expected, in July and October. The multi-year comparison shows an increase in bird strikes.

### ***Wrong vehicle/equipment operations on the apron/taxiway***

In 2019, three collisions were recorded between taxiing aircraft and equipment or vehicles, resulting in material damage. Just over 350 occurrences were reported involving failure to maintain a safe distance between a vehicle, person or object and a taxiing aircraft. This was double the previous year’s figure. The majority of occurrences were recorded in Switzerland. Incorrect positioning of materials or vehicles on the aircraft stand contributed significantly to an increase in occurrences involving this safety issue in 2019. This increase is explained, at least in part, by the improved reporting culture amongst ground handling staff at airports and airfields.


### ***Aircraft movement error on the apron/taxiway (own power)***

In this category, 20 occurrences at Swiss or foreign airports and airfields were reported in which a (non-) commercially operated aircraft failed to maintain a safe distance from other aircraft, vehicles or objects while taxiing or parking. Half of these occurrences resulted in a collision where material damage was recorded. The number of occurrences was stable compared with the previous year. In addition, more than 70 occurrences were recorded internationally of movement by an aircraft without ATC clearance on a taxiway or apron. In the past three years, occurrences in this category have increased. In 2019, just under 7% of these occurrences had to be classified as serious.

## 6.4. Air traffic management

The task of air traffic management is to ensure the safe and efficient movement of aircraft during all phases of their operation. In this chapter we provide information about the safety issues relating to air traffic management (ATM) and airborne conflicts between aircraft.

### 6.4.1. Safety issues in air traffic management

<b>Airborne conflicts</b> This includes collisions, airproxes and occurrences that can lead to an airborne collision, as well as resolution advisories from collision warning systems.  <b>Airspace infringements</b> All reported (confirmed and suspected) airspace infringements are recorded in this category. This includes airspace infringements caused by Swiss-registered aircraft abroad, as well as infringements of controlled airspace (Delta and Charlie airspace classes) by any aircraft within Skyguide's area of responsibility (i.e. including delegated airspace in Germany, France, Italy and/or Austria). This category also includes infringements of restricted areas (LS-Rxx in Switzerland, restricted areas abroad).  <b>Communication error between pilot and ATC</b> This includes all occurrences that are mainly (or at least initially) due to missing, defective or misunderstood communication between pilots and air traffic control authorities (or vice versa).  <b>ATC clearance &amp; navigation error by pilot</b> Occurrences where pilots fail to act in accordance with the rules/clearance of air traffic control (ATC) or where pilots have not followed prescribed standard ATC procedures. This includes all occurrences reported by Skyguide involving all aircraft under its responsibility (controlled Swiss airspace plus delegated airspace), as well as occurrences by Swiss-registered aircraft abroad in connection with air traffic control issues (usually reported by crews, safety offices or foreign supervisory authorities).  <b>Pilot deviation from ATM procedures</b> Occurrences where pilots do not operate according to internationally agreed and valid ATM rules and procedures. This includes all occurrences reported by Swiss airports or airfields, as well as occurrences reported by Swiss air traffic control service providers involving Swiss and foreign registered aircraft in Switzerland (including delegated airspace). This also includes occurrences involving Swiss cockpit crews and/or Swiss certified flight operators (mainly reported by their safety offices) in Switzerland and abroad that have violated ATM procedures and regulations.	Safety Risk Areas					
	Aircraft upset	Runway collision	Airborne collision	Ground collision (off runway)	Terrain collision	Obstacle collision
 <p>Safety issues <input type="checkbox"/></p> <p><b>Air traffic management</b></p>						
Airborne conflicts			●			
Airspace infringements			●			
Communication error between pilot and ATC		●	●	●		●
ATC clearance & navigation error by pilot		●	●	●	●	
ATM procedure deviation by pilot	●		●	●	●	

## Overview of safety issues in “Air traffic management” – number and severity of occurrences

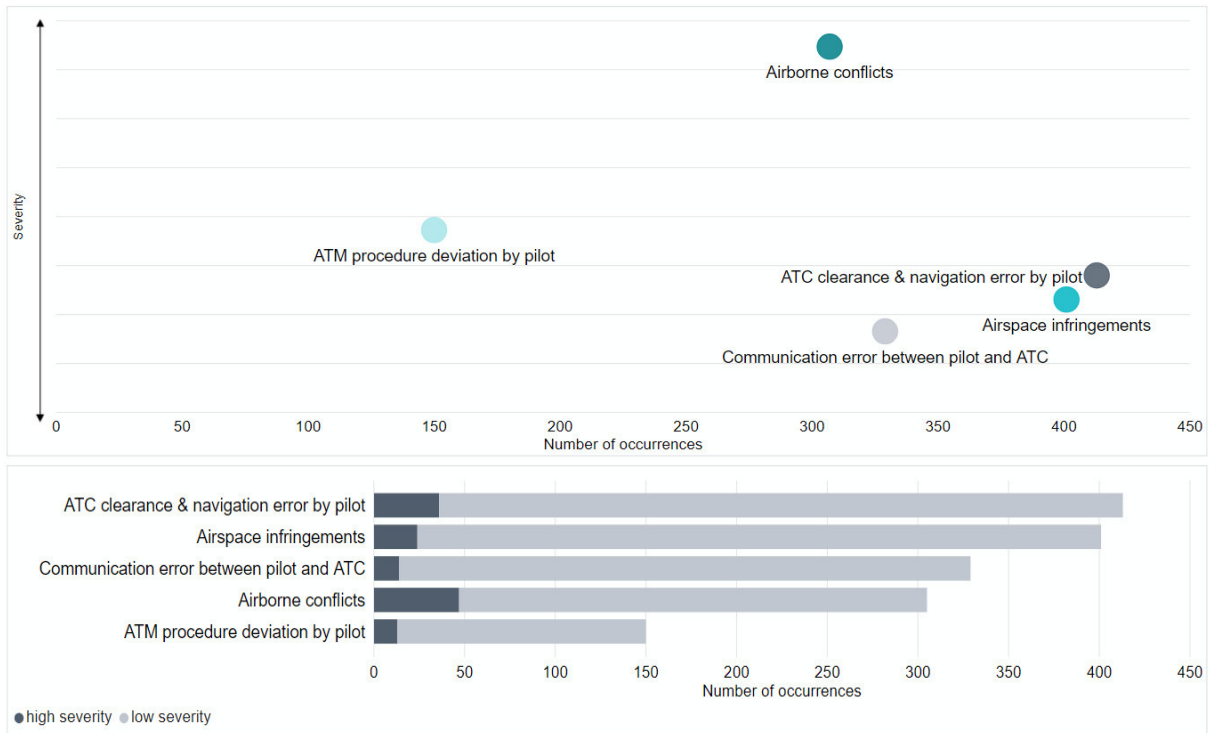


Chart 5: Overview of number of occurrences and severity in “Air traffic management” safety issues

## Number of occurrences in “Air traffic management” safety issues over the last four years



Chart 6: Number of occurrences in “Air traffic management” safety issues over the last four years

### 6.4.2. Data analysis of safety issues in “Air traffic management”

#### Airborne conflicts

In 2019, there was one airborne collision involving a Swiss aircraft. The accident occurred in St. Anton am Arlberg (AT) on 2 June 2019 between a glider and a hang glider. The hang glider pilot was seriously injured; the glider pilot managed to land without problems after the accident in St. Gallen-Altenrhein. The Accident Investigation Unit (aviation) of the Austrian Federal Office for Transport has opened an investigation.

In Swiss airspace<sup>3</sup>, a total of 206 airborne conflicts were recorded in 2019. On top of these came a further 142 reported occurrences in delegated airspace managed by Switzerland, resulting in a total of 348 reported occurrences.

The number of reports for all occurrences relating to this safety issue decreased.

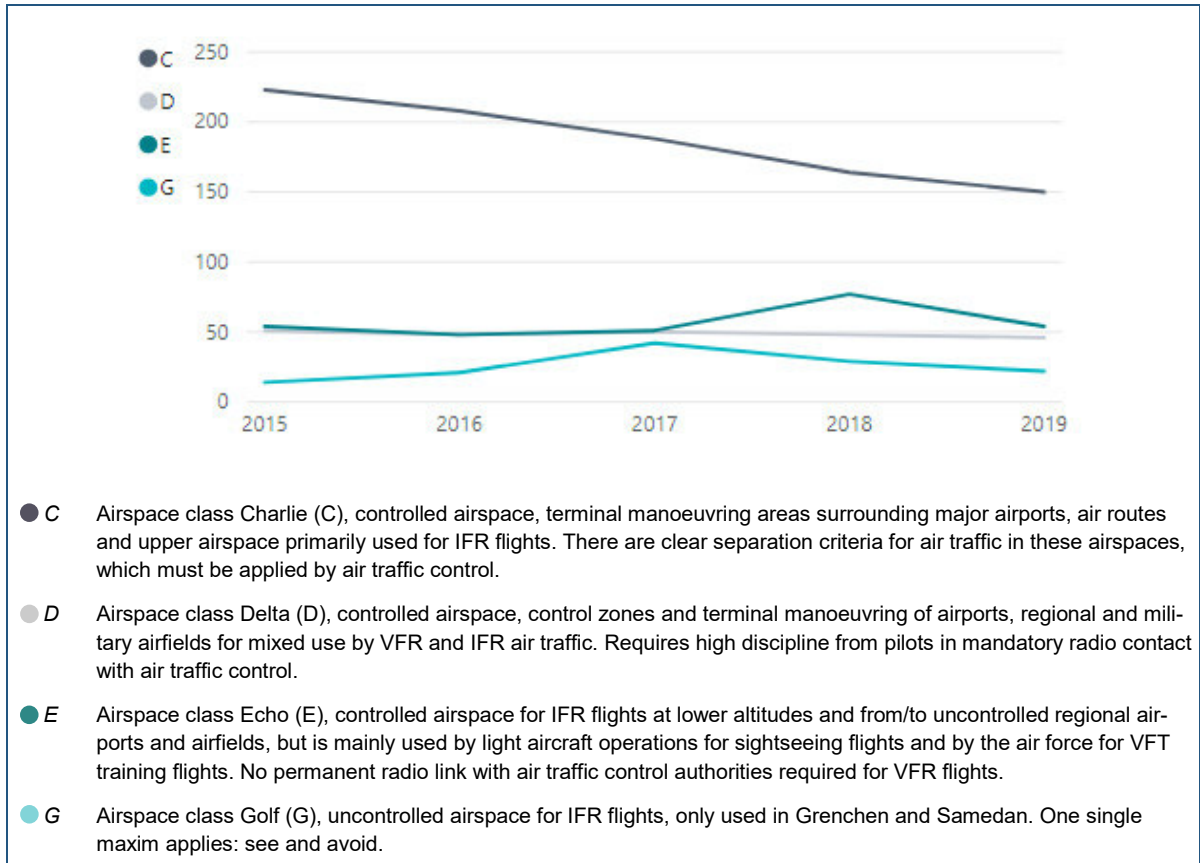


Chart 7: Number of airborne conflicts in Swiss airspace 2015-2019

The proportion of occurrences involving airborne conflicts of high severity decreased in 2019 compared with the previous year.

<sup>3</sup> The ICAO airspace classes are defined to meet a wide variety of air traffic requirements, such as commercial and private air traffic, traffic under visual and instrument flight rules, aircraft manoeuvrability and speeds, and to ensure sufficient distances between aircraft. Consequently, the typical hazards, risks and potential measures in these airspace classes also differ.

## Airspace infringements

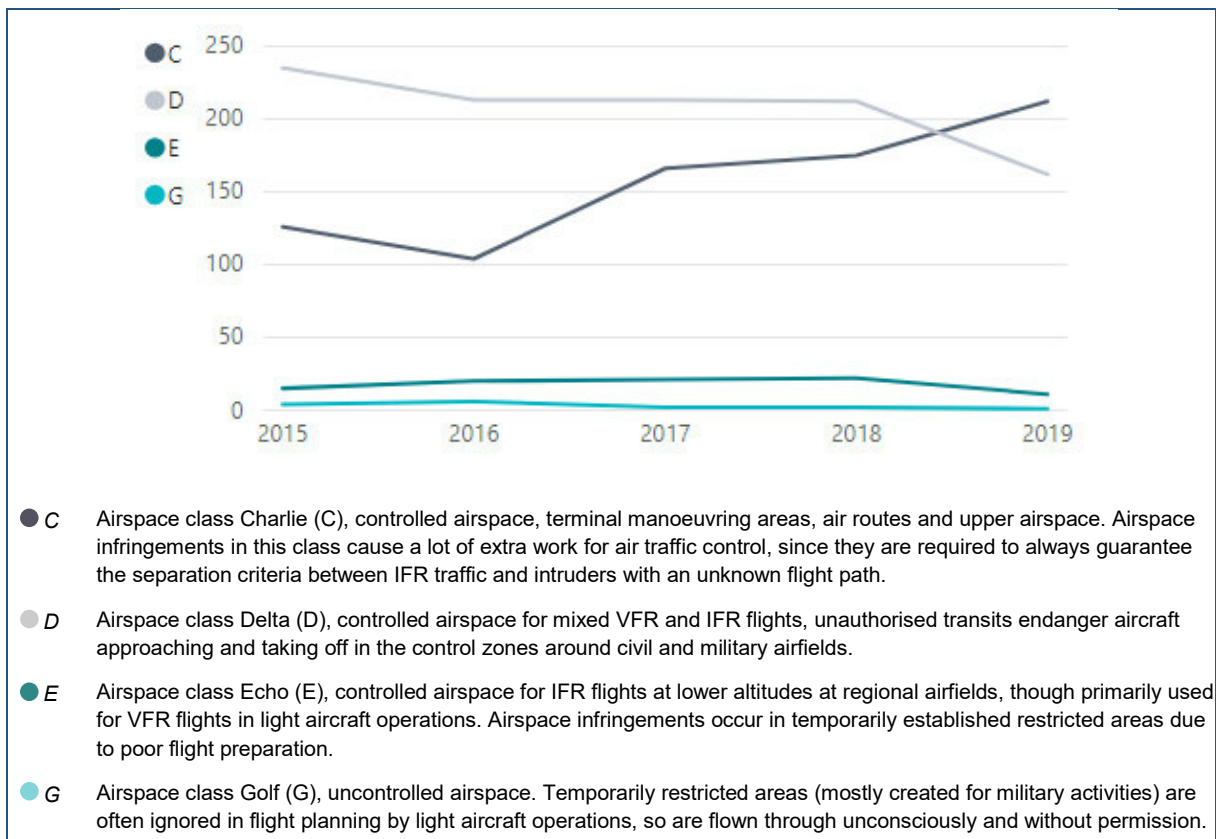


Chart 8: Number of airspace infringements in Swiss airspace 2015-2019

The number of airspace infringements reported by air traffic control authorities in Switzerland rose again in 2019, to 318 (up 13% on the previous year). Although most of these airspace infringements were fortunately classified as low risk, some caused infringements of minimum separation standards with commercial aircraft, or at the very least created a lot of extra work for air traffic control authorities. Almost all airspace infringements were caused by non-commercial or general aviation pilots and were due to distractions by passengers, inadequate flight preparation or route and altitude changes due to deteriorating weather conditions.

### Communication error between pilot and ATC

There was a further increase in the total number of occurrences reported in Switzerland (mainly by air traffic control operators) and abroad (by Swiss air carriers or Swiss pilots) in 2019 compared with previous years. Regarding reports concerning foreign countries, it is noticeable that Swiss airline pilots feel insecure much more frequently in Spain and France because the Spanish and French air traffic control authorities speak, respectively, Spanish and French too often, which reduces the crews' situational awareness. A similar situation exists in Switzerland (mainly at Sion and Geneva airports), where the use of French has caused communication problems and prevented pilots from gaining an overview. In Sion, this phenomenon was temporarily improved with the introduction of "English Only". Given the decision by the Transport and Telecommunications Committee of the National Council on motion 19.3531 ("Do not prohibit national languages for non-commercial VFR flights"), the problems of situational awareness and limited communication described above could recur in future.

### ***ATC clearance & navigation error by pilot***

Compared with 2018, the number of reported occurrences involving deviations from Swiss ATC clearances decreased slightly in Delta airspace and increased by 17% in Charlie airspace.

Reports of deviations from taxiing clearances at controlled airports almost doubled year-on-year. This often resulted from the pilot not recognising, or inadequately recognising, the taxiway and thereby using an incorrect taxiway, despite correctly reading back the clearance. Most of these occurrences were classified as no safety effect or low risk.

### ***ATM procedure deviation by pilot***

The occurrence category of unadjusted (too high) rates of descent and climb recorded a 20% year-on-year decline in the number of occurrences. High descent and climb values when transitioning to a new flight level ordered by air traffic control are one reason why automatic avoidance recommendations (Aircraft Collision Avoidance System, ACAS) are generated for other aircraft in the vicinity.


The "Deviation from standard take-off route" occurrence category recorded a year-on-year increase of more than 20%. This always requires further intervention by the responsible air traffic control authority and increases the load on radio frequencies.



## 6.5. Flight operations

This chapter focuses on safety issues in flight operations. With the exception of the transport of dangerous goods, the focus here is on the human performance of the flight crew.

### 6.5.1. Safety issues in flight operations

Wind shears and turbulences	Safety Risk Areas				
	Aircraft upset	Runway excursion	Injuries/damages	Airborne collision	Terrain collision
<p>Wind shears and turbulences can be caused by air movements associated with convective activity, especially within or near a thunderstorm or near a jet stream. Turbulences can also occur in the absence of clouds and at high altitudes. Turbulences tend to be unproblematic for large aircraft, but for smaller aircraft can lead to uncontrollable flight attitudes, which must be quickly counteracted. These days aircraft operated by airlines are equipped with modern warning systems that alert pilots to wind shears at an early stage so that they can react as quickly as possible.</p> <p><b>Insufficient flight preparation</b></p> <p>Flight planning consists of planning the intended route through the various airspaces at the required flight altitude, accurately calculating performance data and the required amount of fuel, checking weather data and collecting other relevant information for executing the flight.</p> <p><b>Deviation from procedures and checklists</b></p> <p>Many years ago, the cockpit of an aircraft would contain two pilots, a navigator and a flight engineer. The latter roles are no longer required in modern aircraft since much of the work is performed by computers, cutting-edge technology and the pilots. However, due to the increasing complexity of technology and systems, special procedures and checklists have had to be defined to minimise the error rate for operating the controls. Such procedures and checklists tell the pilots the specifications by which they should fly and the on-board systems to use in order to ensure passengers are transported as safely as possible.</p> <p><b>Unstabilised approach</b></p> <p>An unstabilised landing approach can lead to an aircraft not meeting the necessary criteria for landing safely (speed, orientation, configuration). This can lead to the aircraft being damaged during touchdown (hard landing) or overshooting or veering off the runway, resulting in injuries to passengers and damage to the aircraft.</p> <p><b>Flight parameter exceedances</b></p> <p>Flight parameters can be infringed in all flight phases of an aircraft. This is usually caused by pilot carelessness or external influences, such as turbulences or wind shears, as well as rapid changes in wind direction. Such deviations generally include a rapid change in airspeed, flight direction, horizontal/vertical flight attitude, but also operational limits of aircraft systems, such as engine/engine temperatures, g-force loads or load values on flight control surfaces. In extreme cases, such deviations can cause aircraft upset.</p>	 <p>Safety issues in Flight operations</p>				
Wind shears and turbulences	●		●		
Insufficient flight preparation	●	●		●	
Deviation from procedures and checklists	●	●			●
Unstabilised approach	●	●			●
Flight parameter exceedances	●	●			
Dangerous goods transportation	●		●		
Unstabilised landing		●			

### Dangerous goods transportation

Dangerous goods are objects that may pose a risk to aircraft and/or their occupants when they are transported. Dangerous goods are therefore only allowed to be transported if special restrictions are observed with regard to packaging, quantity transported, storage space and proximity to other objects or flight categories.

### Unstabilised landing

During landing and taxiing, influences such as wind shears, thermal convections, optical illusions or an incorrect assessment of the rate of descent can lead to unstabilised landings. As a result, the aircraft may hit the runway too hard or, due to too much lift, flare too long over the runway until touchdown. Undercorrecting such situations can cause the aircraft to overshoot or veer off the runway; overcorrecting can cause a rear-end impact.

Overview of safety issues in “Flight operations” – number and severity of occurrences

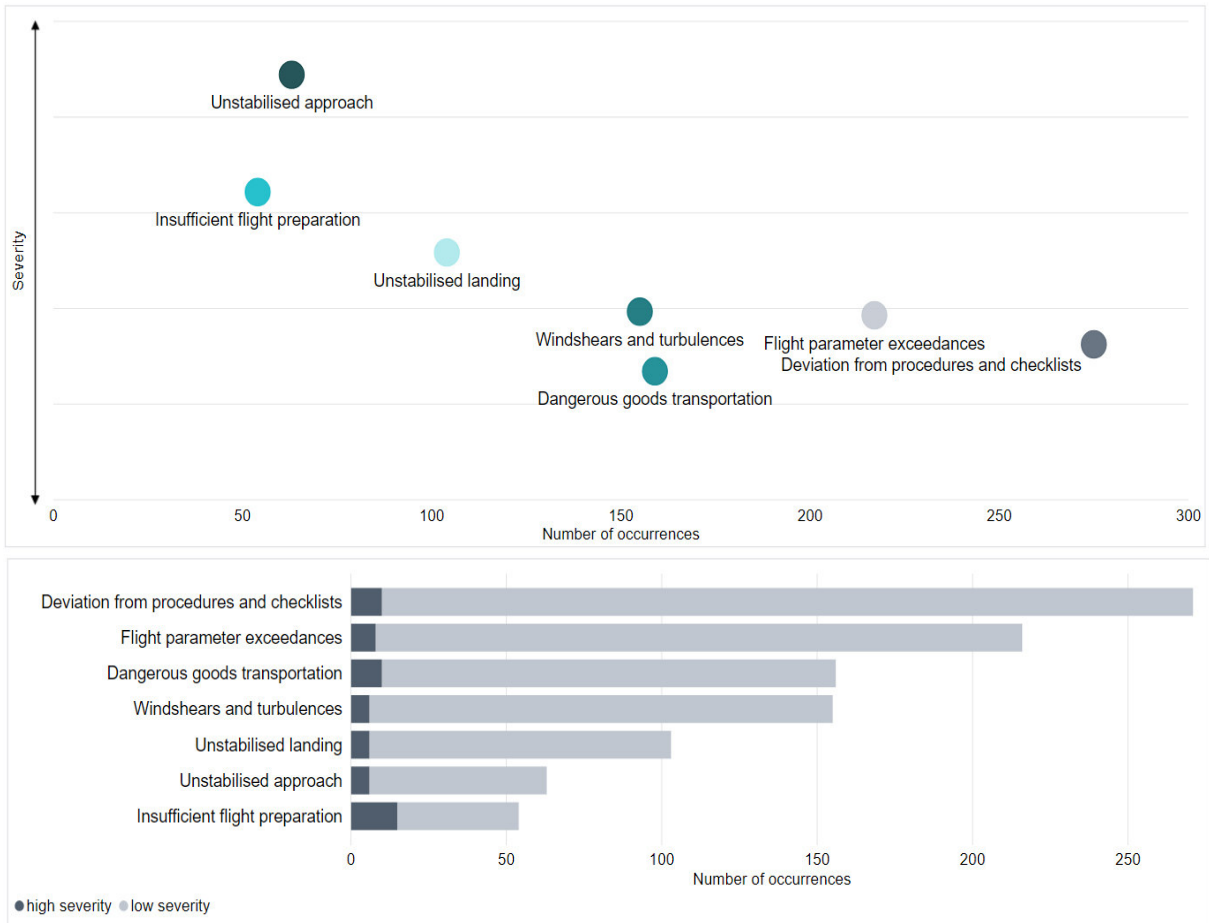


Chart 9: Overview of number of occurrences and severity in “Flight operations” safety issues

## Number of occurrences in “Flight operations” safety issues in the last four years

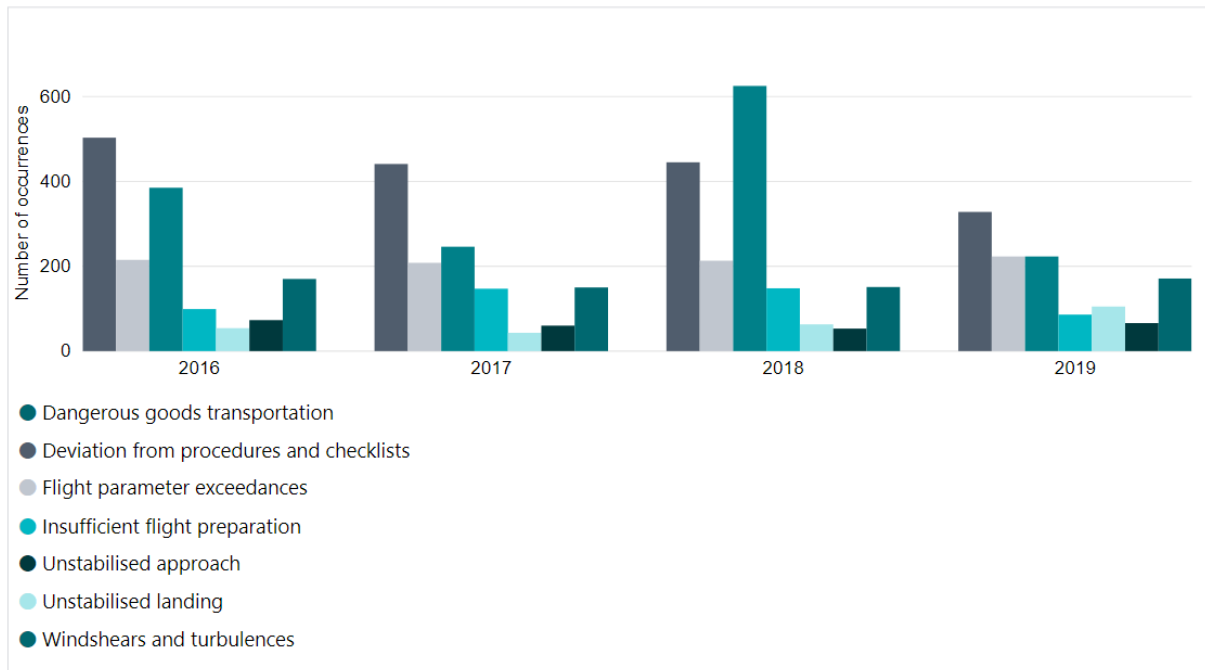


Chart 10: Number of occurrences in “Flight operations” safety issues in the last four years

### 6.5.2. Data analysis of “Flight operations” safety issues

#### **Wind shears and turbulences**

The number of reports received has remained stable in recent years and is highly dependent on seasonal weather conditions. Of just under 100 reports of turbulence, only 3% were of a high severity, with isolated cases of minor injuries to flight personnel in the passenger cabin.

#### **Deviation from procedures and checklists**

The number of occurrences has remained constant over the last four years and, given the improved reporting culture, may even have decreased. The majority of reports concern general procedures such as inaccurate application of general flight procedures (35%), errors in configuring and trimming aircraft (35%), performing required actions too late or in the wrong sequence (25%) and deviations in the use of checklists (10%). Fewer than 10% of reports came from recreational aviation or flight schools.

#### **Unstabilised approach**

Aeronautical companies must clearly define minimum criteria to be complied with by pilots for stabilised approaches. If these criteria are unintentionally deviated from, the flight crew must initiate a take-off manoeuvre. Such a manoeuvre was initiated in approx. 15% of all unstabilised approaches.

In 2019, only 66 reports of unstabilised approaches were filed, of which 10% showed higher risk potential. This corresponds to the average of the last five years and is deemed to be unproblematic.

#### **Flight parameter exceedances**

Over the last four years, the number of occurrences involving deviations from flight parameters has remained constant. Since the general reporting culture in the industry has improved hugely over the years, it may even be the case that the trend is downward.

The commonest reports concern minor deviations in airspeed, which were primarily caused by weather conditions (wind, turbulences). Unintentional changes in the angle of inclination around the transverse

axis were the second most common type of report at 30%, followed by deviations around the longitudinal axis at 10%. Only 10 occurrences had increased risk potential, and half of these related to recreational aviation.

### ***Unstabilised landing***

International statistics show that runway excursions due to veering off or overshooting are one of the greatest risks here, and this has also been observed in Swiss civil aviation in recent years. While the trend in 2018 was stable year-on-year (19 occurrences), 2019 saw only 10 occurrences. Aircraft over-shot the runway in two cases and veered off the runway in eight cases. These serious incidents occurred exclusively in recreational aviation.

However, the largest number of reports (90%) in this area (unstabilised landing) came from commercial air transport, with aircraft landing too hard in 19 cases and touching down on the runway too late in 73 cases.

The only damage was material damage to the aircraft; no one was injured.

### ***Insufficient flight preparation***

Flight preparation mainly consists of planning the intended route through the various airspaces, accurately calculating performance data and the required amount of fuel, and checking weather data of relevance to executing the flight. Commercial flight operations have specialists trained in this important task, while in recreational aviation private pilots are themselves responsible. Weaknesses in flight planning are mostly seen amongst recreational pilots, mainly in the selection of flight route: this causes airspace infringements, which can lead to air traffic control having to divert other airspace users to avoid dangerous airproxes.

While 150 reports were received in 2017 and 2018, the number of occurrences in 2019 reduced to fewer than 90. Of the total number of occurrences, 40% were caused by foreign aircraft and the remaining 60% by Swiss-registered aircraft, with private aviation accounting for 70%.

### ***Dangerous goods transportation***


In 2018, the number of occurrence reports increased hugely compared with 2017, due to the changed reporting culture and (overly) high awareness in the industry.

In 2019, conversely, there was a huge correction downwards to 230 reports, slightly below the 2017 figure. Most of the cases concerned undeclared goods, followed by insufficiently packaged or damaged shipments.

## 6.6. Helicopter operations

This sub-chapter mainly looks at safety issues relating to work flights.

### 6.6.1. Safety issues in helicopter operations

<p><b>Unintentional contact between an external load and the ground/objects during flight</b></p> <p>During a flight with an attached under-load, the load becomes attached to an object on the ground or touches the ground or objects on the ground during flight.</p> <p><b>Total or partial loss of load</b></p> <p>During transport, all or parts of the external load are lost.</p> <p><b>Laser attack</b></p> <p>The sudden appearance of a strong light source that exposes a pilot to glare can have different impacts, depending on its intensity. The possible consequences range from a brief distraction to temporary blindness or permanent eye damage. Exposing crews to glare is illegal and can have fatal consequences, especially in the crucial phases of approach, take-off or low-altitude flight, which require a pilot's full attention.</p>	Safety Risk Areas			
	Aircraft upset	Injuries/damages	Terrain collision	Obstacle collision
 <p>Safety issues <b>Helicopter operations</b></p>				
Unintentional contact between an external load and the ground/objects during flight	●	●	●	●
Total or partial loss of load		●		
Laser attack	●			

### Overview of safety issues in “Helicopter operations” – number and severity of occurrences

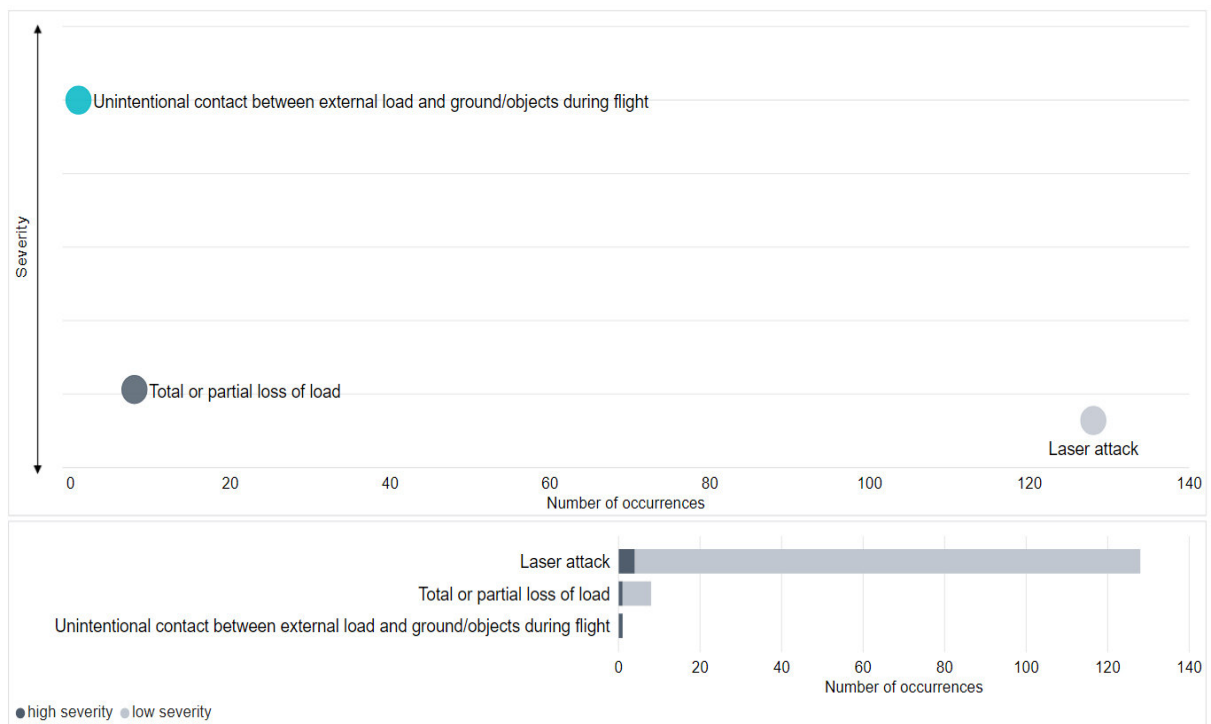


Chart 11: Overview of number of occurrences and severity in “Helicopter operations” safety issues

### Number of occurrences in “Helicopter operations” safety issues in the last four years



Chart 12: Number of occurrences in “Helicopter operations” safety issues in the last four years

In 2019, although there was a slight year-on-year increase in the number of reports of occurrences involving external load flights, it is in line with the average of the last few years and is too small for a clear conclusion to be drawn about a possible trend.

After an increase the previous year, the number of flight assistants and other ground personnel injured as a result of external load operations fell in 2019.

#### 6.6.2. Data analysis of “Helicopter operations” safety issues

##### *Unintentional contact between an external load and the ground/objects during flight*

The number of reports in this regard was in line with previous years. Only one occurrence was reported in 2019, where the transport rope became caught on a church spire.

##### *Total or partial loss of load*

After a decline in 2018, the number of reported load losses returned to the level of previous years. There were no casualties from loss of load.

##### *Laser attack*


In recent years, we have seen an increase in the outdoor use of lasers for legitimate purposes, such as laser shows and commercial testing. Similarly, there has been an increase in the use by private individuals of hand-held laser pointers for the intentional (and illegitimate) illumination of airplanes and helicopters. Disruptions of this nature are very dangerous for pilots in critical flight phases such as take-off and approach/landing, especially for helicopter pilots.

Awareness-raising campaigns and a legislative change criminalising laser glare are proving effective, with the number of reports of laser glare decreasing once again in 2019. Helicopters were affected in only 5% of all reports.

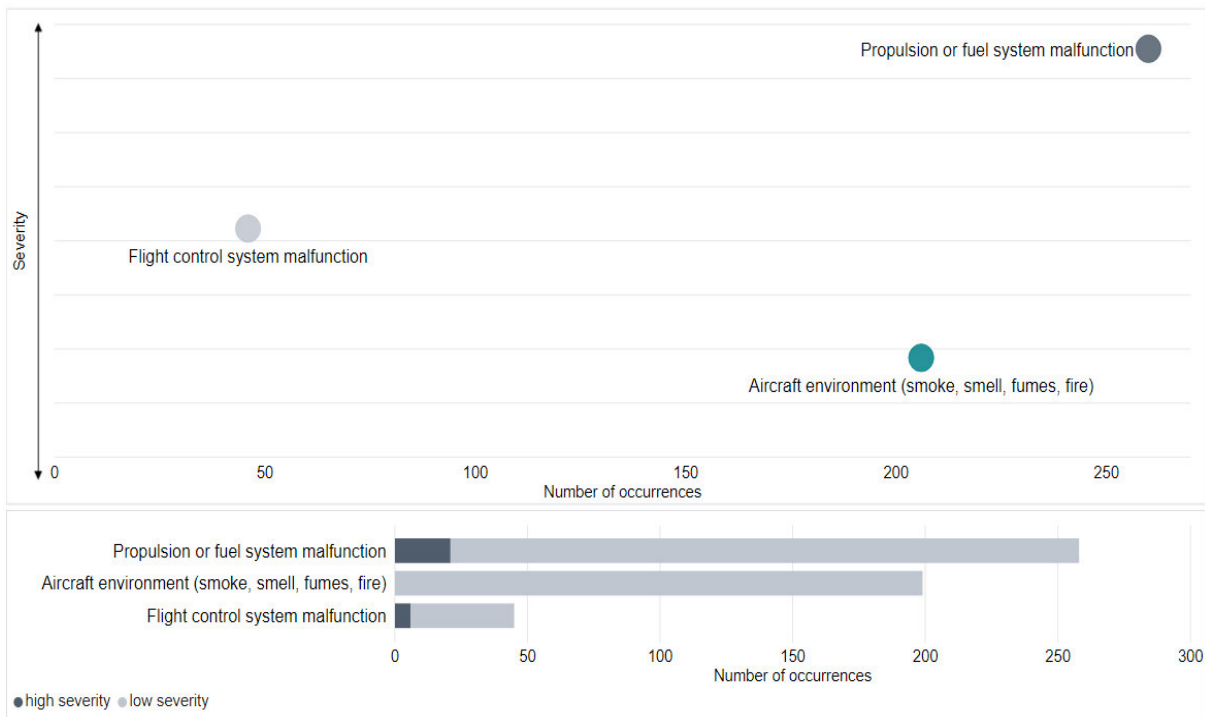
## 6.7. Technical

In this sub-chapter, we provide you with information about safety issues relating to technical occurrences.

### 6.7.1. Safety issues in Technical

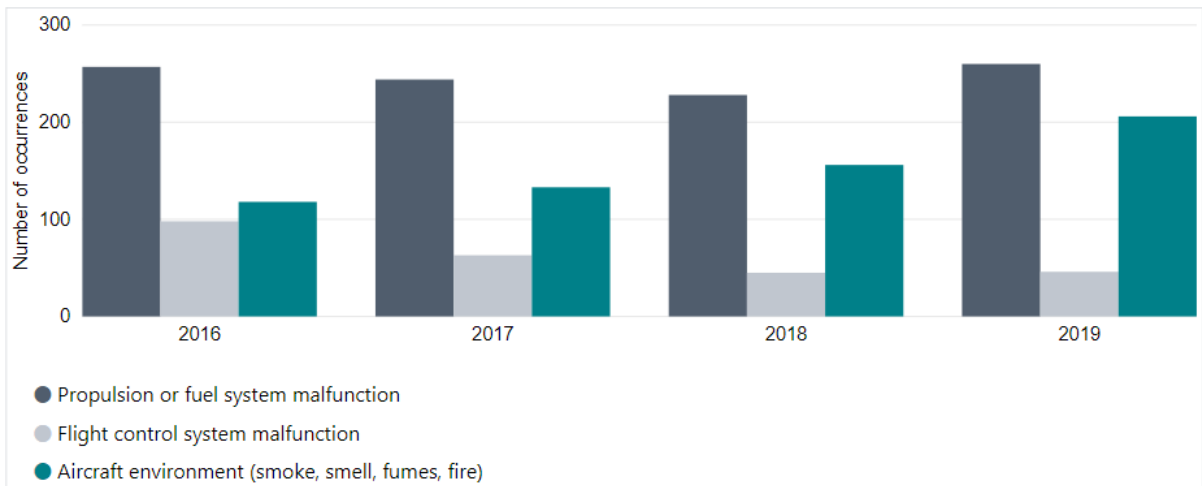
<b>Propulsion or fuel system malfunction</b>  A partial or complete loss of propulsion power can lead to an emergency landing or aircraft upset. Possible causes are technical defects in the propulsion systems (engine, propeller, transmission and related systems) or fuel system, faulty manipulation, maintenance errors, damage incurred on the ground, bird strikes, weather conditions, fuel shortage or contaminated fuel. A loss of power or engine failure does not always lead to an emergency. Modern passenger aircraft can be controlled, even after engine failure, and crews receive ongoing training for this type of event. If necessary, pilots can also shut down engines or operate them at reduced power to prevent damage. This can be the case, for example, with engine vibrations, an overly high EGT (exhaust gas temperature) or an overly low oil level or oil pressure.	Safety Risk Areas		
	Aircraft upset	Runway excursion	Injuries/damages
 <p>Safety issues <input type="checkbox"/></p> <p><b>Technical</b></p>			
Propulsion or fuel system malfunction	●	●	
Aircraft environment (smoke, smell, fumes, fire)	●		●
Flight control system malfunction	●	●	
<b>Aircraft environment (smoke, smell, fumes, fire)</b>  Smells can arise in an aircraft for various reasons. Depending on the source, concentration and chemical composition of the smell, the health or performance of the aircraft occupants may be adversely affected. In a few cases, to prevent potential risks, smells or smoke in the cockpit led to a precautionary landing or to the crew using oxygen masks. Airlines follow established processes to investigate such occurrences and eradicate their causes.  In general, the following causes in particular can cause smells to form in aircraft: <ul style="list-style-type: none"> <li>• Traces of oil from an engine or APU (auxiliary power unit) that penetrate the air-conditioning system</li> <li>• Defective electrical/electronic components</li> <li>• Development of smells in the galley due to defects, soiled ovens or coffee machines</li> <li>• Defects in the cabin pressure and air-conditioning system</li> <li>• External sources of smells on the ground (e.g. de-icing, ambient air)</li> <li>• Luggage, cargo, passengers</li> </ul> Uncontrolled fire in an aircraft is one of the hazards with potentially the greatest impact and can lead to aircraft upset as a result of damage to the structure, control systems or crew.			
<b>Flight control system malfunction</b>  The flight control system serves to control the aircraft around its three axes and comprises the various control surfaces and their control mechanisms; in helicopters, this is mainly the main and tail rotor control mechanism. Failure or malfunction of flight control systems may result in aircraft upset.			

**Overview of safety issues in “Technical” – number and severity of occurrences**



**Chart 13:** Overview of number of occurrences and severity in “Technical” safety issues

**Number of occurrences in “Technical” safety issues in the last four years**



**Chart 14:** Number of occurrences in “Technical” safety issues in the last four years



## 6.7.2. Data analysis of “Technical” safety issues

### *Propulsion or fuel system malfunction*

In 2019, the number of reported occurrences relating to these issues was the same as in previous years.

In general aviation in particular, loss of engine power is one of the main causes of accidents due to technical reasons. In 2019, five engine failures in fixed-wing aircraft and two in helicopters led to either an emergency landing or a crash. One of the fixed-wing aircraft affected was electrically powered, the others were powered by combustion engines. If a design or manufacturing fault is identified as the cause, the corresponding occurrence is forwarded to the responsible certification authority for it to clarify and initiate possible corrective measures and improvements with the responsible stakeholders (type certificate holder, design organisation, manufacturer).

In commercial aviation, defective turbines of a new engine type led to measures including diversion landings in three cases in 2019. The causes are being investigated by the manufacturer and the responsible safety investigation and approval authorities. The potential safety impact of most occurrences was deemed to be low.

### *Aircraft environment (smoke, smell, fumes, fire)*

In 2019 there was an increase in reports of unusual smells or smoke, but there were no reports of occurrences of onboard fire. In the majority of smoke occurrences, components in the galley or entertainment system were identified as the source. In the occurrences reported of onboard smells, approx. 19% were attributed to engines or auxiliary systems, 5% to electrical or hydraulic systems, 10% to the galley or cabin and the remainder to other systems, external causes and unidentified one-off occurrences. Swiss commercial scheduled and charter airlines reported occurrences of unusual smells, fumes or smoke in fewer than 0.1% of all flights. Again, in almost all cases, the potential direct impact on aviation safety was deemed to be low.

### *Flight control system malfunction*

In passenger aircraft, the important systems are usually designed with redundancy; if one system fails, others take over some or all of its functions and the aircraft can still be controlled. Failures and problems are displayed to the pilots, according to their severity, as indicators or warnings, in order to enable appropriate measures to be taken. In addition, the crews receive periodic training for potential failures of the various systems.

The number of reported occurrences in 2019 remained virtually unchanged compared with previous years. In the majority of occurrences, the potential impact was rated as low.

## 7. EMERGING ISSUES

### 7.1. Drones and U-space

The number of occurrence reports and occurrences relating to drones decreased slightly in 2019. In the 2019 reporting year, there were two occurrences involving postal service drones that were transporting medical samples. The first occurrence occurred over Lake Zurich when the drone released its parachute as part of an emergency sequence and fell into the lake. The emergency sequence was triggered because the drone had lost its positioning mechanism due to a short circuit. The second occurrence occurred in “Ob der Hub” in Zurich when the drone also released its parachute as part of an emergency sequence. The emergency sequence was triggered by overly big differences in the flight attitude of the two sensors determining it. The parachute was released correctly, but the rope attaching the drone to the parachute broke and the drone crashed into forest. No one was hurt. According to the usual processes applicable to aviation accidents and serious incidents, SUST was informed and modifications were made to the aircraft design to ensure safe operation in the future. This incident shows that in principle, the Specific Operational Risk Assessment (SORA) methodology used is suitable for ensuring safe operation. Of the three existing safety barriers for protecting third parties on the ground – flight path with minimal danger, reduction of energy on impact (parachute), avoidance of escalating effects – only the parachute failed.

There were no reports of drones causing personal injury in accidents. The FOCA strongly urges players in Switzerland’s civil aviation sector to report all occurrences involving drones so that it can obtain as complete and objective a picture as possible. It will take some time before it is possible to assess the influence of an improved reporting culture.

The sale of drones, especially in the hobby sector, is likely to have increased less sharply than in previous years. It is estimated that more than 100,000 drones have been sold in Switzerland, although exact figures on how many of these aircraft are actually in use in Switzerland are not available. The number of reported occurrences involving drones in 2019, most of which concerned sightings by aircraft crews, fell slightly year-on-year. The FOCA received 79 reports from pilots or Skyguide air traffic controllers about drone sightings. Of these, 38 came from passenger aircraft and 12 concerned occurrences at foreign airports. The FOCA received 41 reports in the reporting year from light aircraft operations, business aviation and the air force. Swiss airspace accounted for 67 reports. In order to estimate the risk of a collision between a drone and an aircraft, a detailed risk assessment was carried out in 2018; this showed the probability of a collision between a drone (max. 2 kg) and an aircraft (airliner, business jet, small aircraft, helicopter) in Switzerland. This risk assessment was updated in 2019 and there were no significant changes in risk.

The FOCA regards the risk situation as stable, but is aware that increased attentiveness and communication efforts will be required in the future to ensure that the ever increasing number of drones designed for use by the general public are employed responsibly. In recent years, the Federal Council has also recognised the need for remote identification of drones in order to ensure enforcement of the law. This is why the FOCA’s newly created Innovation and Digitisation (ID) unit is supporting development of a U-space. This is a system for introducing automated traffic management for drones. If drones are subject to automated traffic management, their identification, monitoring in airspace and coordination with other airspace users, and the protection of particularly sensitive areas, can be ensured. Since it will incorporate all the necessary elements for enforcement of the applicable legal provisions, U-space will become the central instrument for ensuring the safe, controlled operation of drones and serve as a basis throughout Europe.

It will soon be technically possible to register and identify drones electronically. A live demonstration for safety teams in September 2019 showed that the various identification systems work and are interoperable. Each system can also reliably identify those drones that are not logged onto its own system. This is crucial if different service providers are offering their services for U-space, and will also significantly improve law enforcement. It will enable sensitive areas to be reliably protected and offending drone

pilots to be identified, or face a fine if their device is not properly registered. Further trials and demonstrations for affected cohorts are planned for 2020, such as automated traffic management between drones registered with different service providers. But U-space will bring even more advantages in the next few years for the benefit of manned aviation. It will be a few years before the link between manned and unmanned aviation is established on a fully automated, nationwide basis. Although U-space is developing at a very fast pace – thanks, not least, to the industry's appetite for innovation – it takes time to meet aviation safety standards and create, as required, the basics for certification and standardisation. Switzerland is playing a leading and decisive role in these rapid developments and in the development of Europe's legal foundations. Correspondingly scalable legal foundations should pave the way for a civil aviation authority with competence in the relevant areas and an outstanding research and development environment. The FOCA is determined to continue strengthening these factors and view change as an opportunity.

## **7.2. Cyber security**

Building on previous years' work, further measures and binding rules for aviation cyber security were developed in 2019 at a global, European and national level. In order to achieve proportional and coordinated regulations and requirements that meet Switzerland's interests, the FOCA continued to play an active role in the ICAO, the European Civil Aviation Conference (ECAC) and the relevant EU/EASA bodies in 2019.

At national level, the first steps in implementing the second National Strategy for the Protection of Switzerland against Cyber Risks (NCS 2.0) was initiated, and the FOCA maintained an extremely active role in its development. In addition, a new aviation cyber security position was created at the FOCA, which is due to be filled in summer 2020.

## **7.3. Disruption to the Global Navigation Satellite System above conflict zones**

Occurrences of jamming the Global Navigation Satellite System (GNSS) increased dramatically in 2019. A total of 500 reports were received, whereas very few were sent to the FOCA in previous years. Figures from the European Aviation Safety Agency (EASA) and the International Air Transport Association (IATA) confirm this trend, which is particularly evident in conflict zones in the Middle East. This interference is likely to be caused by military jammers on the ground, and commercial flight operators are well aware of the problem and its effects. When GPS signals are jammed, for a short time the aircraft's navigation system cannot receive them. To date, there has been no evidence of GPS spoofing and corresponding misleading signals being emitted. GPS Jamming occurrences are usually only of short duration and observable for only a few minutes.

The FOCA currently deems the safety risk caused by GPS jamming to be low, an assessment that is also confirmed by EASA. Aircraft for commercial passenger transport are equipped with additional reference systems for navigation, which, independently of GNSS, can easily provide relatively accurate navigation over long time frames. In addition, pilots are promptly alerted to such signal errors by the aircraft systems so that they can conduct additional monitoring of the subsequent flight path.

In the future, the FOCA will focus on refining how such occurrences are dealt with and initiate any necessary measures with flight operators.

## 8. ASSESSMENT AND OUTLOOK

Thanks to data and information from industry and private aviation, the key issues relating to the safety of Swiss civil aviation are well known. Analysing occurrences is an essential element of the safety risk assessments that the FOCA carries out with regard to safety-relevant activities. In addition, management decisions will increasingly be risk- and performance-based and prioritised in accordance with pre-defined criteria. Data obtained from occurrences can be used as a basis for making decisions, along with other factors, for example in the framework of the AVISTRAT project or mandatory transponders.

In view of the European risk portfolio and its findings, the two safety risk areas of “airborne collisions” and “aircraft upset” also appear high up on our list of priorities in Switzerland. The Airprox Analysis Board (AAB) was reformed in 2018 and further developed in 2019. It has been given the required importance through a new mandate and terms of reference, and will soon have important, ground-breaking decisions to make. Topics such as Transponder Mandatory Zones (TMZ) are being discussed with various experts to determine whether such zones can reduce the risk of airborne collisions.

This year’s safety report (ASR2019) provides industry partners with a retrospective of reports and occurrences relating to Swiss civil aviation in 2019, and we would like to take this opportunity to express special thanks to the industry for the continuous improvements in reporting culture. This safety report has examined systemic, operational and emerging issues in finer detail. Having analysed the data of over 10,000 occurrence reports, we have identified safety issues in various categories. These priorities help the FOCA target its resources more effectively in terms of oversight and defining measures to continuously improve safety performance. Analysing occurrence data is an important starting point for further discussions and work. We will need to collect even more data on the topics of drones, U-space and cyber security to be able to draw lessons from this information and any occurrences that should occur.

In addition to proactively identifying opportunities and risks in Swiss civil aviation, the FOCA continues – factoring in other sources of information, such as findings from audits, inspections and accident reports, and developments abroad – its crucial role of analysing occurrence data. Obtaining the most comprehensive overview possible enables us to draw the right conclusions and remain sensitive to changes in the aviation system.