Bundesstelle für
Flugunfalluntersuchung

German Federal Bureau of
Aircraft Accident Investigation

Statistics 2017

Accidents and Incidents during Operation of Civil Aircraft

BFU - V181

German Federal Bureau of
Aircraft Accident Investigation

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Introduction

In accordance with Regulation (EC) No. 996/2010[1] and the Federal German Law relating to the investigation of accidents and incidents associated with the operation of civil aircraft[2], the German Federal Bureau of Aircraft Accidents Investigation (BFU) conducts investigations of Accidents and Serious Incidents during operation of civil aircraft. According to the law the sole objective of the investigation shall be the prevention of future accidents and incidents. It is not the purpose of this activity to assign blame or liability or to establish claims.

In addition, the BFU publishes annually anonymised statistics of accidents and incidents. These statistics have the purpose to inform the interested public about the incidents which had been reported to the BFU during the reporting period. Covered are all national and international occurrences involving German registered aircraft and Foreign registered aircraft in Germany.

In accordance with ICAO Annex 13[3] on multiple occasions the BFU assisted Foreign investigation authorities, e.g. read-out of flight data recorders and cockpit voice recorders. These events are not subject to these statistics.

The following numbers represent the Accidents and Serious Incidents which had been reported to the BFU in 2017.

The International Civil Aviation Organization (ICAO) classifies the following incident categories as High Risk Categories:

- Loss of Control in flight (LOC-I)
- Controlled flight into or towards terrain (CFIT)
- Runway safety related events (Abnormal Runway Contact, Bird Strike, Ground Collision, Ground Handling, Runway Excursion, Runway Incursion, Loss of Control on Ground, Collision with Obstacle(s), Undershoot / Overshoot and Aerodrome)

In addition to the high risk category occurrences other key aspects are described.

[1] Regulation (EU) No. 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation
[2] (Flugunfall-Untersuchungs-Gesetz - FlUUG) of 26 August 1998
[3] Annex 13 to the Convention on International Civil Aviation, International Standards and Recommended Practices, Aircraft Accident and Incident Investigation

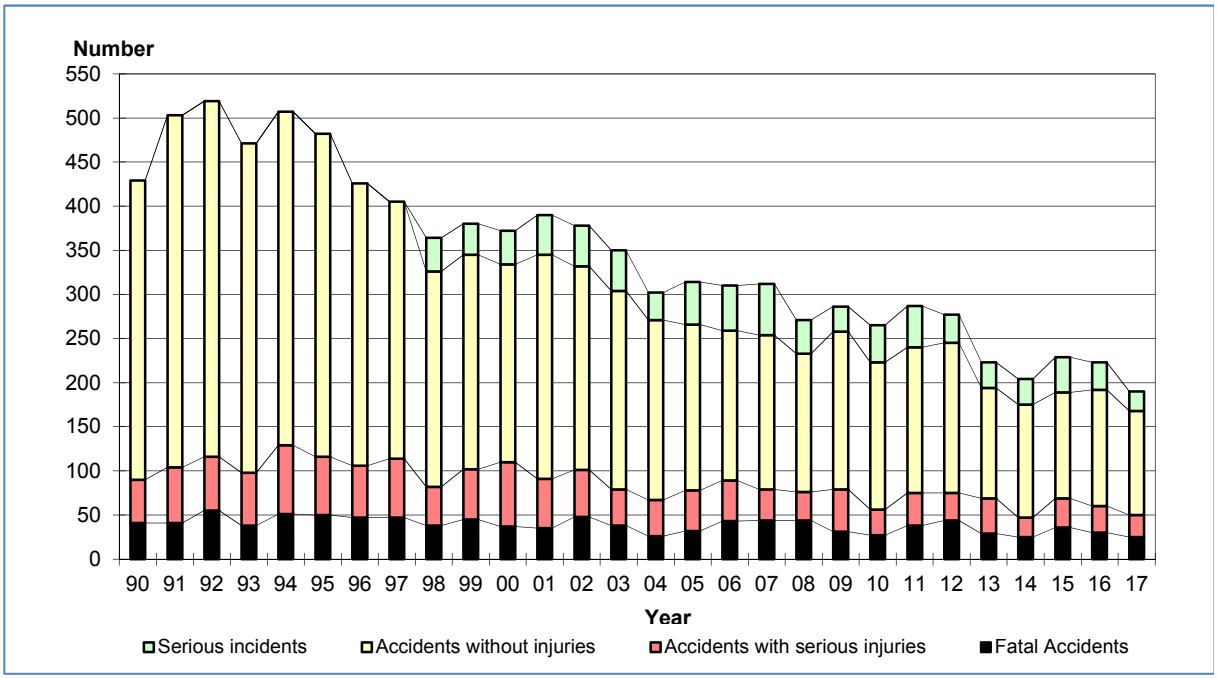
It is not possible to make a statement regarding the accident rate solely based on the presented numbers, because at the time of the publication of this report the movement data (numbers of flight hours and flights) was not available.

Note:

This document is a translation. Although every effort was made for the translation to be accurate, in the event of any discrepancies the original German document is the authentic version.

Overview Accidents and Serious Incidents

In 2017 the BFU registered a total of 168 Accidents and 22 Serious Incidents involving civil aircraft in Germany and German registered aircraft abroad.



Accidents according to degree of injury and Serious Incidents 1990-2017 Source: BFU

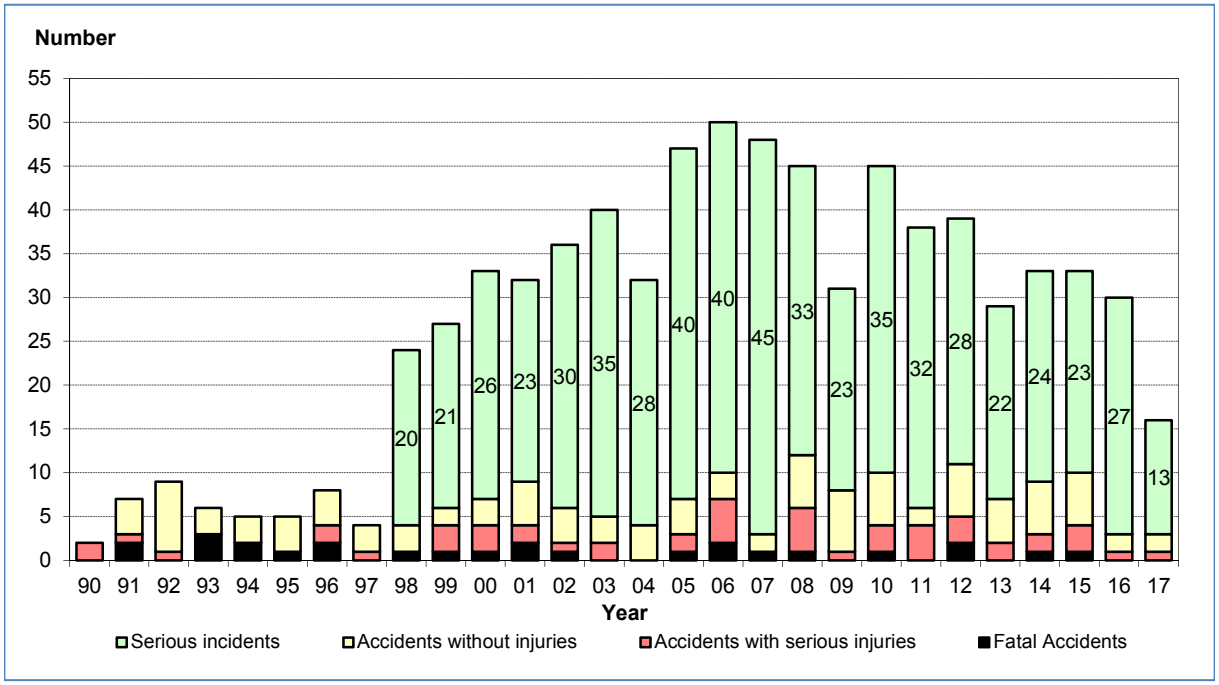
In the previous year the BFU recorded to date the lowest number of national and international Accidents and Serious Incidents of German registered aircraft and Foreign registered aircraft in Germany of the last 28 years. Compared with the 1990s the number of Accidents and Serious Incidents has more than halved.

Compared with the average of the years 2012-2016 in 2017 the number of fatal Accidents decreased from 31 to 24 and the Accidents with serious injuries from 33 to 25.

Analysis According to Aircraft Types and Take off Mass

Airplanes with a Maximum Take-off Mass of more than 5.7 t.

In 2017 the BFU registered a total of 3 Accidents and 13 Serious Incidents involving airplanes with a Maximum Take-Off Mass (MTOM) of more than 5.7 t.



Accidents and Serious Incidents involving airplanes with a MTOM of more than 5.7 t. Source: BFU

The number of occurrences in 2017 has decreased by half compared with the average value of the previous 5 years (8 accidents, 25 serious incidents).

One Accident was attributed to temporary Loss of Control in flight (LOC-I) after a Bombardier CL604 of a German corporate/business aviation operator had entered the wake vortex of an Airbus A380 flying 1,000 ft higher in opposite direction. Two occupants of the CL604 suffered serious injuries and the aircraft was substantially damaged. In the last 6 years this was the only occurrence of the LOC-I category involving aircraft with a MTOM of more than 5.7 t.

Bombardier CL604 after the landing Source: BFU

The BFU registered 3 occurrences in the category Runway Safety Related Events. One Serious Incident was due to a hard landing of an Airbus A319 of a Foreign operator and two runway excursions.

One of the two runway excursions occurred during the landing of a Cessna Citation 550B of a Foreign corporate/business aviation operator when the left main landing gear retracted and the airplane veered left off the runway. Due to the substantial damage of the airplane the occurrence was classified as Accident.

Accident site Cessna 550B Source: BFU

The other runway excursion occurred as a landing Airbus A320 of a German operator overshot the end of the runway and came to a stop on the grass. This occurrence was classified as Serious Incident.

During loading of an Airbus A320 of a German operator a conveyor drove into the fuselage and caused substantial damage. The occurrence was classified as Accident.

In two cases, which were classified as Serious Incidents, the co-pilots could no longer exercise their function due to incapacitation.

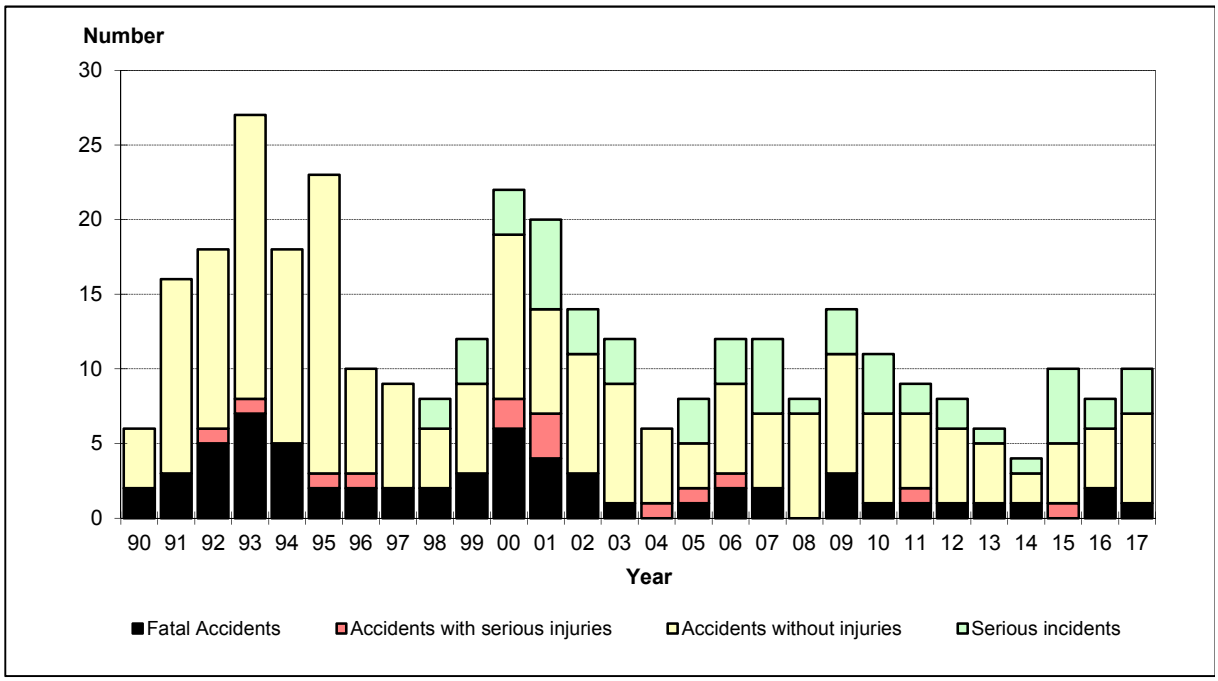
In 2017 the BFU received a total of 203 notifications regarding occurrences, where smell or smoke had developed. On the one hand this is a decrease compared with the 228 reports of the previous year, but on the other hand shows the still great disposition to report such events. The BFU initiated investigations with 10 of the 203 occurrences. Three were classified as Serious Incidents and seven as Incident with BFU investigation.

After the landing of an Airbus A320 of a German operator at Helsinki Airport a laptop caught fire in the cabin; smoke and smell developed. This occurrence was classified as Serious Incident.

During 2 Serious Incidents involving a Boeing 767-300 smell developed which had been described as "electrical". In each case the pilots donned their oxygen masks and conducted a diversion. The investigation identified scorched defrosters as the cause for the smell.

Airplanes with a Maximum Take-off Mass of 2-5.7 t.

A total of 7 Accidents and 3 Serious Incidents were registered involving aircraft with a MTOM between 2 t and 5.7 t.



Accidents and Serious Incidents involving airplanes with a MTOM between 2 and 5.7 t Source: BFU

During approach of a commercial passenger flight with a Cessna 510 of a Foreign operator loss of control occurred which ultimately resulted in ground impact. The passenger and the two pilots were killed and the aircraft was destroyed.

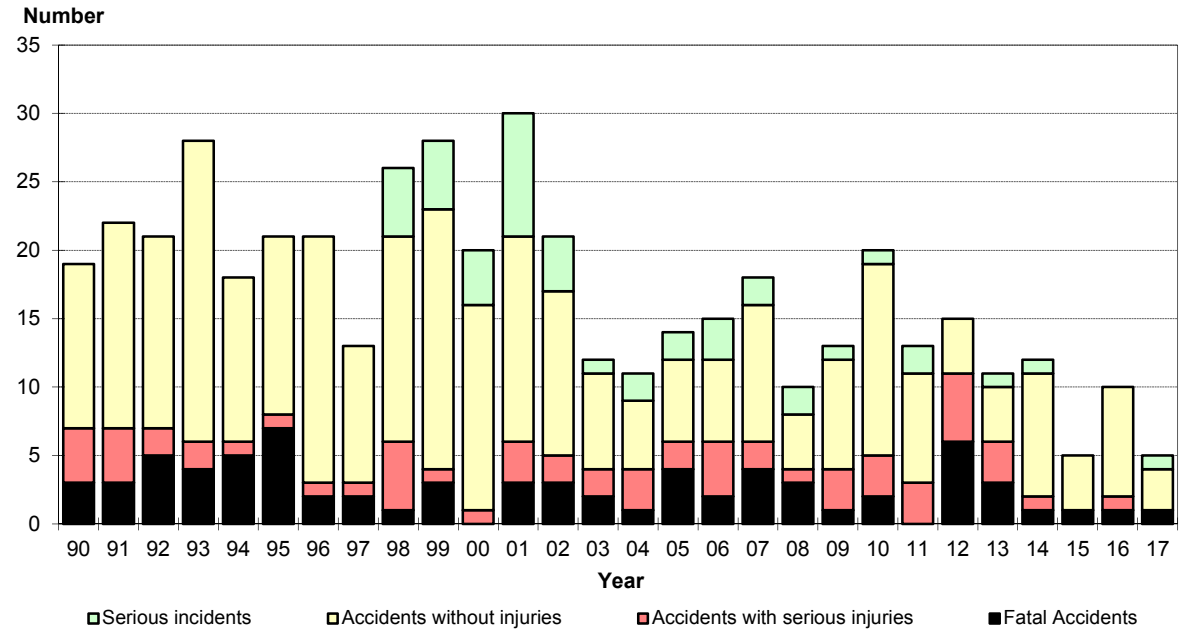
Wreckage Cessna 510 Source: BFU

The main landing gear or the nose landing gear fractured during 4 Accidents. Two Accidents occurred when the airplane collided with obstacles during taxiing.

During an ambulance flight with a Cessna 425 smoke developed in the cabin. The occupants donned oxygen masks, the pilots descended to flight level 100, and completed the checklist, which stopped the smoke emission; it was possible to continue the flight to the destination airport. This occurrence was classified as Serious Incident.

Helicopter

In 2017 the BFU registered a total of 4 Accidents and 1 Serious Incident involving helicopters.



Accidents and Serious Incidents involving helicopters Source: BFU

This number of Accidents was less than half of the 10 Accidents on average per year between 2012 and 2016.

One fatal Accident occurred in Austria during a private flight where a German registered Bell 47 collided in low level flight with a cable. The two occupants suffered fatal injuries, the helicopter was destroyed.

During the landing approach of a private flight in Germany the main rotor of a Robinson R-44 collided with a street lamp. One person was slightly injured and the helicopter substantially damaged.

Accident site Robinson R-44 Source: Witness

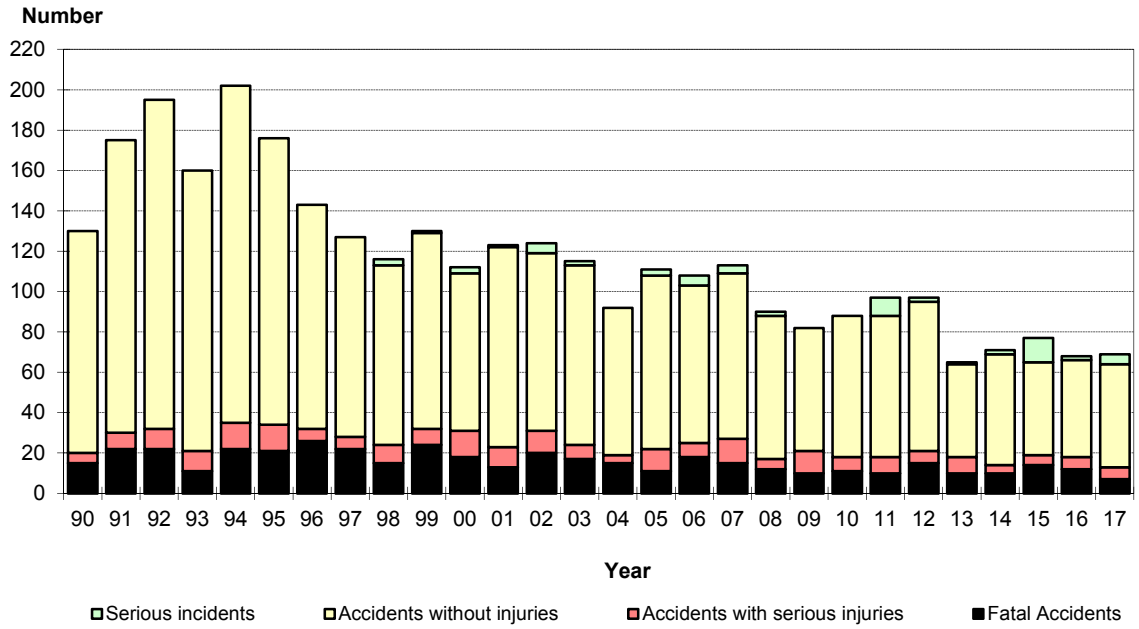
During take-off of a German registered Bell 206 to a commercial agricultural flight over a rice field in Spain the sprayer got caught in the crops. The helicopter overturned and was substantially damaged.

During autorotation after engine failure of a Robinson R22 the helicopter tipped over on its side and was substantially damaged.

During a charter flight of a Sikorsky S-76 of a German operator an unintended approximation of the water's surface occurred. It was just possible to avoid contact with the water. This occurrence was classified as Serious Incident.

Airplanes with a Maximum Take-off Mass of up to 2t.

In the previous year the BFU received a total of 64 Accidents and 5 Serious Incidents reports involving airplanes with a MTOM of up to 2 t.



Accidents and Serious Incidents involving airplanes with a MTOM up to 2 t Source: BFU

This number of accidents is the lowest of the last six years. However, in 2017 7 fatal Accidents involving airplanes with a MTOM of up to 2 t occurred. Compared with the mean value of the years 2012-2016 of 12 fatal Accidents the number has almost halved.

Five of the seven fatal Accidents occurred in connection with the occurrence category controlled flight into or towards terrain (CFIT). Seven persons suffered fatal injuries.

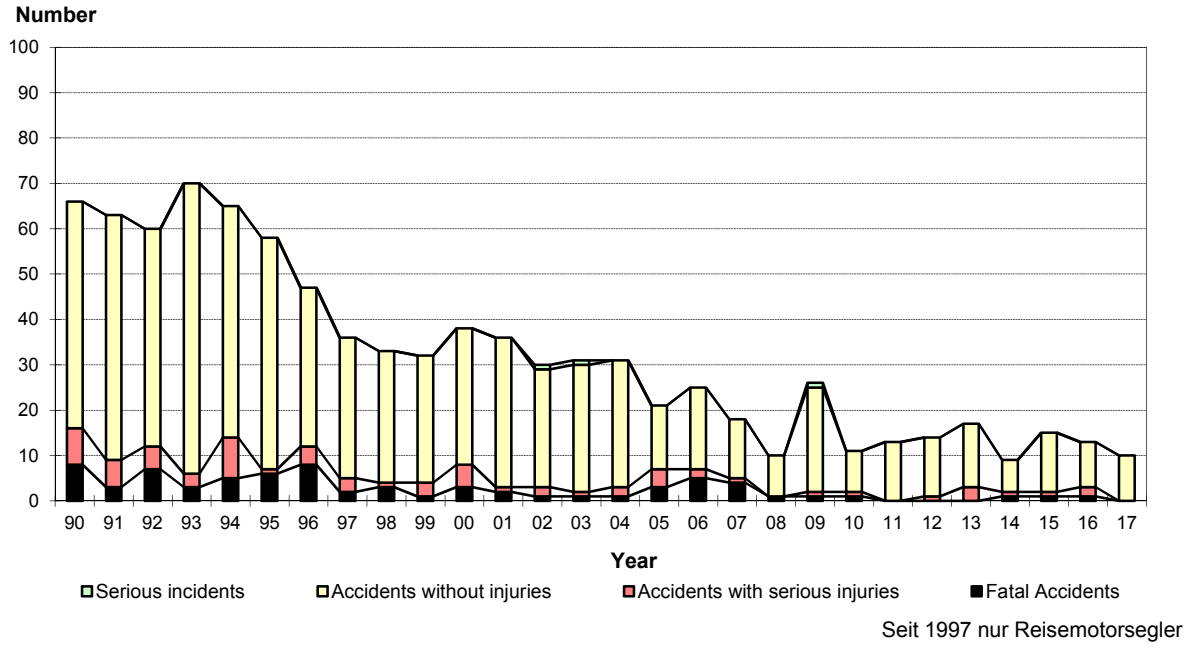
The other 2 fatal Accidents were part of the category Loss of Control in flight (LOC-I). During a private flight with a Piper PA-46 (Malibu) in accordance with instrument flight rules an uncontrolled flight attitude during climb and subsequent in-flight separation occurred. The airplane crashed into Lake Constance; both occupants lost their lives.

Wreckage recovery Piper PA-46 Source: BFU

During the second Accident the pilot of a Morane MS 883 lost control of the aircraft due to incapacitation and was fatally injured.

Touring Motor Gliders

In 2017 the BFU received a total of 10 Accident reports with touring motor gliders. At one Accident involving a Grob G109 a hard landing occurred and the occupants were slightly injured. The other nine Accidents only caused property damage.

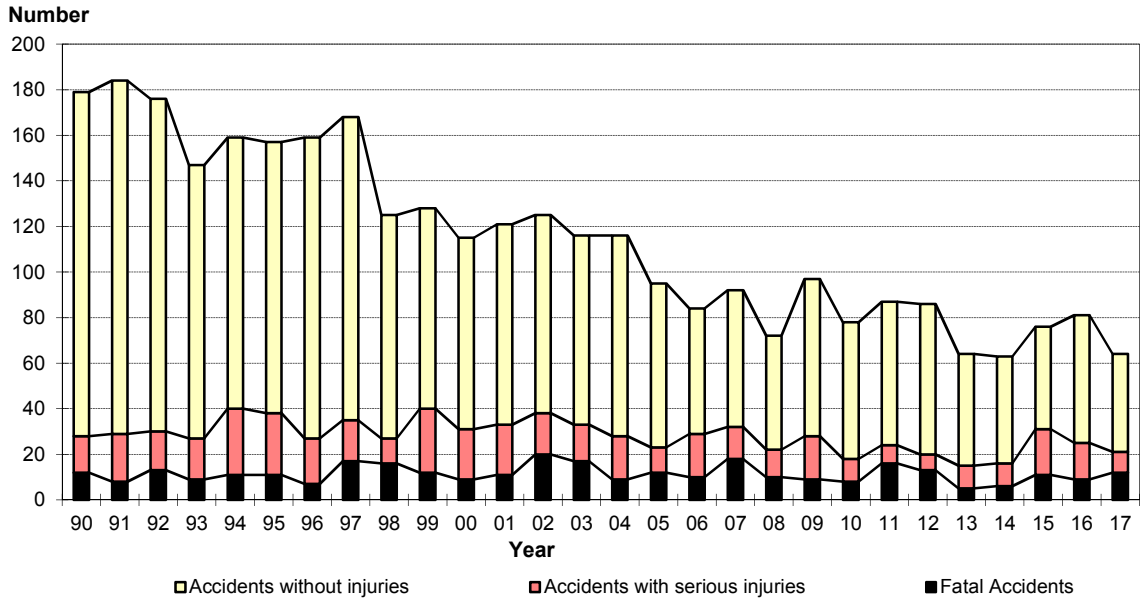


Accidents and Serious Incidents involving touring motor gliders Source: BFU

As in the previous years, in 2017 most of the Accidents (6) with touring motor gliders occurred during the landing phase. The results were hard landings and fractured landing gears. In 2 cases the engine failed first.

Glider and Powered Glider

A total of 64 Accidents with gliders and powered gliders were registered in 2017.



Seit 1997: Segelflugzeuge mit Hilfsantrieb

Accidents with gliders and powered gliders Source: BFU

Compared with the average of the previous five years (74 Accidents) the number is declining.

As in the previous years, most of the Accidents (53% or 34 Accidents) occurred during the landing approach or landing.

Accident site Schleicher K 7 Source: BFU

A total of 16 Accidents occurred during take-off.

Fatal Accidents

In 12 of the 64 Accidents persons were fatally injured. This number is higher than the 9 fatal Accidents on average of the years 2012-2016. Loss of control in flight (LOC-I) occurred in 9 of the 12 fatal glider Accidents. In one case the wing of the glider type Olympia Meise fractured during aerotow. During winch launching of a Grob Astir CS the wing touched the ground. A Glaser-Dirks DG-1000T collided with mountains.

Training Accidents

In 2017 a total of 7 Accidents occurred during training. This number is significantly lower than the average of the previous 5 years (13 Accidents) and is the lowest in 6 years.

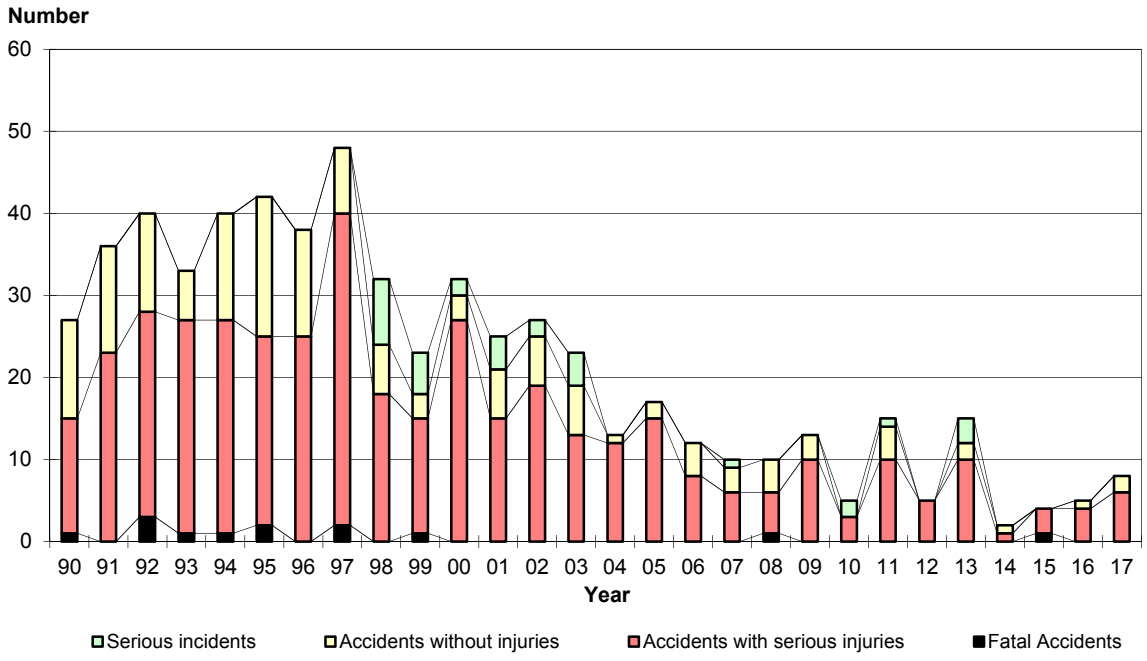
In 4 training accidents people suffered serious injuries.

Six of the seven Accidents were attributed to hard landings of the glider. In 3 cases the flight instructors and the student pilots suffered serious injuries

One student pilot on solo flight suffered serious injuries when the glider, a Grob G-103, collided with trees after the cable had ruptured during winch launching.

Balloons

The previous year the BFU registered 8 Accidents involving balloons. In 6 cases persons suffered serious injuries.



Accidents and Serious Incidents involving balloons Source: BFU

Three hard landings, where occupants suffered severe injuries, were classified as Accidents. When relocating the balloon after the landing the basket tipped over and one passenger suffered serious injuries.

In 2 cases the balloon collided with power lines. The occupants remained uninjured.

One Accident occurred during take-off preparations when a passenger fell out of the basket and suffered serious injuries.

During a balloon ride a collision with another balloon occurred. The damaged balloon touched down hard. The pilot was seriously injured and one passenger suffered minor injuries.

Other Aircraft

Ultralight Aircraft

In 2017 the BFU initiated an investigation with 10 occurrences involving ultralight aircraft. Seven of these were classified as Accidents and 3 as Serious Incidents. In 4 cases persons suffered fatal injuries and in 2 minor injuries.

One fatal Accident occurred during a training flight as a MD 3 Rider collided with a power line. Both, the student pilot and the flight instructor, were killed.

Accident site MD 3 Rider Source: BFU

In the second case a pilot was fatally injured as the ultralight collided with a mountain in poor weather conditions. The third fatal Accident occurred as the ultralight entered an uncontrolled flight attitude. In the fourth case the results of the police investigation indicate suicide.

During a private flight a Pipistrel Virus encountered instrument weather conditions and icing in cruise flight and subsequently crashed into a forest area. The pilot suffered serious injuries. The second Accident with a seriously injured person occurred as a Como Ikarus C-42 entered an uncontrolled flight attitude during climb.

Three aircraft proximities between an ultralight and other aircraft were classified as Serious Incidents.

Gyrocopters

Gyrocopter (symbolic image) Source: BFU

In Hungary a gyrocopter Trixy Aviation G4-2R collided with a cable and the occupants were seriously injured. The occurrence was classified as Accident and the BFU assisted the Hungarian investigation authority.

Unmanned Aircraft Systems

BFU unmanned aircraft system in action Source: BFU

The previous year the BFU received 14 reports concerning occurrences involving Unmanned Aircraft Systems (UAS).

Ten of these reports described approximations between the UAS and other aircraft; two observations of UAS in the airspace close to airports and two referred to crashes of UAS.

Definitions

Accident

Means an occurrence associated with the operation of an aircraft which, [...] takes place between the time any person boards the aircraft with the intention of flight until such time as such persons have disembarked [...], in which:

1. a person is fatally or seriously injured
   - on board an aircraft, or,
   - as a direct contact with any part of the aircraft including parts which have become detached from the aircraft, or,
   - as a result of direct exposure to jet or propeller blast,

except when these injuries are from causes other than the accident, 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 members; or

2. the aircraft or the airframe sustains damage which:
   - which adversely affects the structural strength, performance or flight characteristics of the aircraft , and
   - would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage to the aircraft is limited to the engine concerned, its cowlings or accessories; or for damage limited to propellers, wing tips, radio antennas, tyres, brakes, fairings or to small dents or puncture holes in the aircraft skin; or

3. the aircraft is missing or is completely inaccessible.

Serious Incident

means an occurrence associated with the operation of an aircraft involving

circumstances indicating that an accident nearly occurred.

Fatal Injury:

means an injury which is sustained by a person in an accident and which results in his/her death directly in the accident or within 30 days of the date of the accident.

Serious Injury:

means an injury which is sustained by a person in an accident and which:

1. requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
2. results in a fracture of any bone (except simple fractures of fingers, toes or nose);
3. involves lacerations which cause severe haemorrhage or nerve, muscle or tendon damage; or
4. involves injury to any internal organ; or
5. involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or
6. involves verified exposure to infectious substances or harmful radiation.