

TRAFICOM

Finnish Transport and Communications Agency

Finnish Aviation Safety Review 2023



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1 Safety of commercial air transport

As a whole, the year 2023 was once again safe in Finnish commercial air transport.

No accidents occurred. The number of serious incidents increased compared to the previous years. In many cases, the situation involved yet another near miss with a drone.

The traffic volume in Finnish commercial air transport continued to grow compared to the previous year. However, compared to 2019, the year before the coronavirus pandemic, the numbers were still roughly 15% lower.

The volume of all commercial air transport (Finnish and foreign) at Finnish airports also grew slightly compared to the previous year; however, it remained approximately 29% lower than in 2019.

In 2022, the war in Ukraine caused major changes to flight routes when Russian airspace became closed to European operators. The situation remained the same in 2023.

Disturbances in aircraft satellite navigation systems were still observed in the vicinity of conflict areas in particular. The **bulletin** published by the European Union Aviation Safety Agency EASA on the topic was updated a few times during the year. The disturbances did not have any major impact with regard to aviation safety.

In early 2023, all restrictions related to the coronavirus pandemic as well as measures such as the monitoring of coronavirus in the wastewater at airports were ended.

Globally, in 2023 in commercial air transport (aircraft that are allowed to transport 14 passengers or more) there were four fatal accidents in which 93 lives were lost. The numbers were clearly below the five-year average. In fact, the year was one of the safest on record.

The most serious accident of the year took place in January, when control of the Yeti Airlines' ATR 72 aircraft was lost during approach in Nepal and it crashed, killing 72 people. Source: **Aviation Safety Network**

1.1 Accidents

In 2023, no accidents occurred in Finnish commercial air transport.

No accidents occurred in foreign commercial air transport in Finland in 2023, either.

During the year in February 2023, the Safety Investigation Authority Finland, published an **investigation report** concerning an accident that occurred to a foreign ambulance helicopter in Åland in 2022. In the case in question, the helicopter started to slide on an icy yard and hit a boathouse. The helicopter was seriously damaged and one crew member was slightly injured. As a result of the investigation, it was recommended, among other things, that anti-slip devices should be installed on helicopters equipped with skids.

Accidents in Finnish commercial air transport are extremely rare in general. The last time an accident occurred was in 2020, when a member of the cabin crew fell down from the open door of the aircraft and was injured. SIA conducted the

investigation **L2020-01** (report in Finnish) into the incident.

The last accident before this involving Finnish aircraft in scheduled traffic occurred in 2005 (Copterline), and the previous accident in other commercial air transport (sightseeing flight) occurred in October 2016.

Occurrences are made proportional to the flight hour data collected e.g. from Finnish aircraft owners. The **flight hour statistics** for 2023 will be compiled during spring 2024. Based on an initial estimate, the flight hours in commercial air transport increased by approx. 10% compared to 2022, i.e. to approx. 270,000 flight hours.

The calculated average for 2013-2023 based on this estimate was 0.2 accidents per 100,000 flight hours.

Browse accident statistics starting from 2005 using an interactive and updating report [here](#).

List of accidents in 2023 (incl. foreign aircraft in Finland)

No accidents

1.2 Serious incidents

In 2023, there were seven serious incidents in Finnish commercial air transport. The number was slightly above the average for 2013-2022 (5.9).

Three cases involved a mid-air near miss with a drone. In fact, a drone flown too high in the wrong place has been the most common cause of a serious incident in recent years. Last year, all situations of this kind took place abroad between Finnish airliners and local drones. Abroad, the number of near misses caused by drones has clearly increased in the last few years. In contrast, the situation in Finland has been improving since 2018. Read more about the development of mid-air **near misses**.

Two serious incidents took place in winter conditions in medical helicopter activities. In one case, the helicopter had to take evasive action in order to prevent hitting a mast, and in the other, a helicopter on the ground started to slide forward on an icy road and its blades hit tree branches.

The last two took place in August at Helsinki Airport. In one of them, an airliner collided with birds during takeoff and had to return to the airport. In the other case, a child passenger was about to get on the plane, but started running after a fallen hat and nearly collided with the rotating propeller of a plane that had just arrived on the apron. A ground handling company employee noticed the dangerous situation and managed to prevent any more severe consequences.

The flight hour information for 2023 will be compiled during spring 2024. Based on an initial estimate, the flight hours in commercial air transport increased by approx. 10% compared to 2022, i.e. to approx. 270,000 flight hours. According to this estimate, approx. 2.7 serious incidents would have occurred per 100,000 flight hours. The average for 2013-2022 was approx. 2.5 serious incidents,

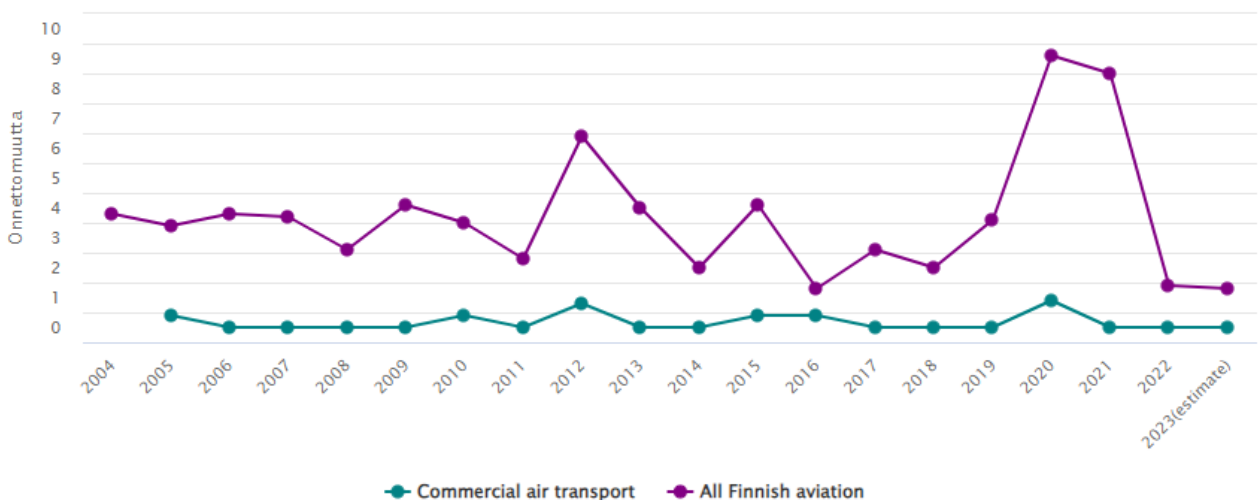
meaning that according to the preliminary information, last year was roughly at the same level as the previous years.

Browse serious incidents starting from 2005 using an interactive and updating report [here](#).

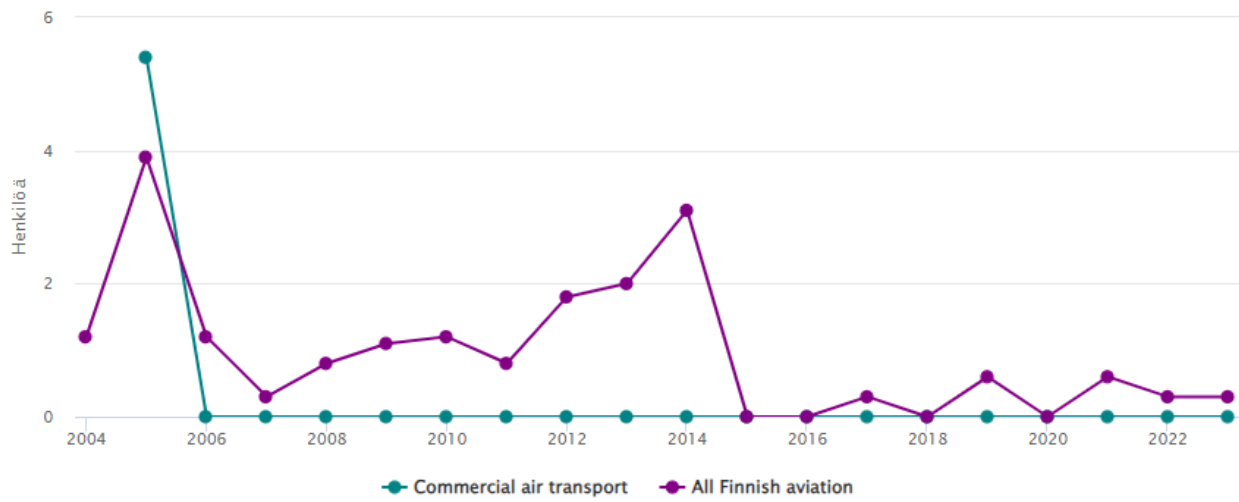
List of serious incidents in 2023

1. February 2023: A medical helicopter had to take evasive action in order to evade a mast.
2. February 2023: A medical helicopter started to slide on the road that was used as the landing site, and the blades hit the branches of trees.
3. April 2023: A near miss abroad between an airliner and a foreign drone.
4. July 2023: A near miss abroad between an airliner and a drone.
5. August 2023: When passengers were walking to an airliner on the apron, a gust of wind swept the hat off the head of a child passenger and tossed it close to a plane taxiing to the apron next to it. The child started to run after the hat without noticing or understanding the danger caused by the rotating propellers of the taxiing plane. A ground handling company employee noticed the dangerous situation and caught the child before any severe consequences occurred.
6. August 2023: Several birds collided with an airliner and its engines during takeoff. The pilots reduced the power to one of the engines and landed successfully back at the airport.
7. September 2023: A near miss abroad between an airliner and a drone.

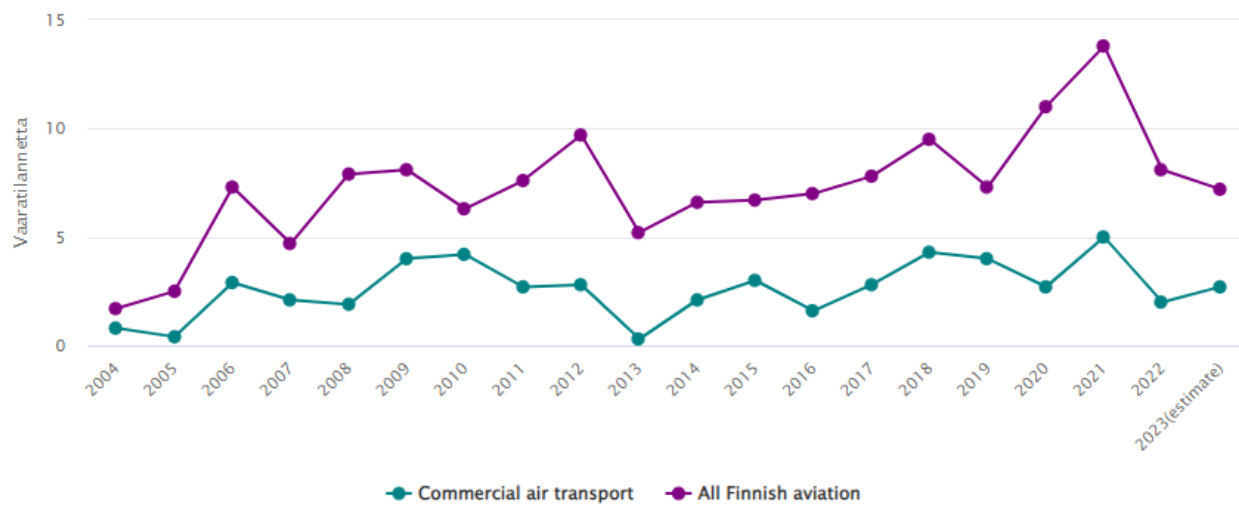
Accidents in Commercial Air Transport per 100 000 flight hours



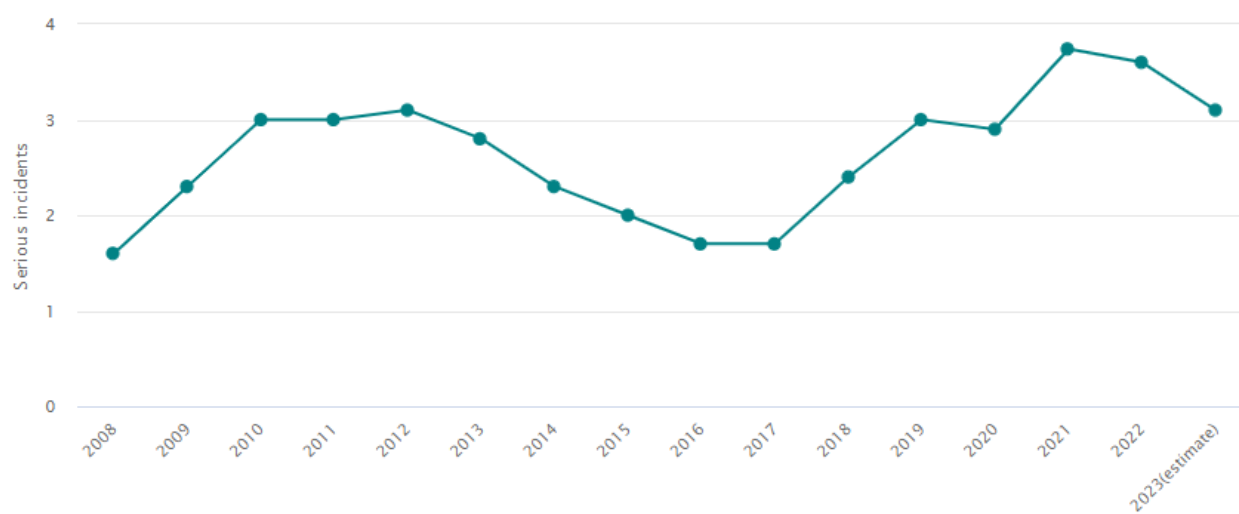
Fatalities in commercial air transport per 100 000 flight hours



Serious incidents in Commercial air transport per 100 000 flight hours



Serious incidents in commercial air transport per 100 000 flight hours, 5 year average



2 Safety of general and recreational aviation

Four accidents occurred in general and recreational aviation in Finland. When measured by the number of accidents, the year was clearly better than the average of the last ten years (9.0). Unfortunately, one of the accidents led to a fatality, when an aircraft crash-landed during an aerobatic show and the pilot died. There were 13 serious incidents. This number is also below the ten-year average (15.9).

Last year, the figures of all tier 2 indicators (main causes of accidents) were below the average of the previous years.

The number of mid-air **near misses** was higher than in the previous year, but it, too, was still below average. The low number of **situations involving loss of control in flight** was positive, because any accidents that result from situations of this kind often have serious consequences.

The number of general and recreational aviation operations (incl. aerial work) at Finnish airports continued to decrease compared to the previous years. The number was approx. 15% lower than in 2022 and 45% lower than in 2019, the year before the coronavirus pandemic.

A large share of general and recreational aviation takes place on uncontrolled aerodromes. More accurate information on these activities will be available in the spring of 2024, when the annual flight time statistics are finished. Based on an initial estimate, the numbers do not seem to differ significantly from the previous year. The flight hour data are based on the reports submitted by Finnish aircraft owners, which means that they have a margin of error depending on how actively the data were reported. The flight hour statistics for 2022 and earlier years are available [here](#).

Please note that this review does not cover the situation of hang gliding and paragliding or skydiving. You can find information about them at the website of the Finnish Aeronautical Association.

2.1 Accidents

As noted, there were four accidents in 2023, which is less than half of the average for 2013-2022 (9.0). According to this assessment of the number of accidents, last year was exceptionally good, as was the year 2022 before that. Unfortunately, one person died in an accident both last year as well as the year before that. More information about the fatal accidents in 2022 and 2023 can be found in the next section below.

Of the accidents in 2023, two occurred in recreational aviation and two in general aviation. Two of the accidents took place during landing, and in fact, landing has typically been the most common phase of flight when an accident occurs.

The number of accidents in recreational aviation (ultralight aircraft, gliders) was exceptionally low last year (2). In the past ten years, an average of 5.8 accidents have occurred per year. No one died in an accident in recreational aviation last year. There has been a clear decreasing trend in the number of accidents

in the past few years.

In the first of the accidents last year, a combination of a towing aircraft and a glider encountered a downburst and heavy downpour that occurred rapidly in the area in Nummela at a low altitude after takeoff. The towing combination was unable to maintain the altitude, and the towing aircraft had to disconnect the glider being towed. The glider carried out an emergency landing in the forest soon after being disconnected. The glider was seriously damaged and the flight instructor and student pilot in the aircraft were injured.

In the second accident, the oil temperature started to rise rapidly during the test flight of an ultralight aircraft. The pilot turned back towards the field, but the engine stopped and the pilot had to carry out an emergency landing in a stand of pine. The aircraft was damaged, but there were no serious personal injuries.

In general aviation, the number of accidents (2) was likewise slightly below the average for 2013-2022 (3.2). One of the accidents led to a fatality. In general aviation, there have been slightly fewer accidents on average than in recreational aviation during the last 10 years. The situation has remained fairly stable in recent years, with the exception of the year 2020, when an exceptionally high number of accidents occurred.

The pilot died in the first of the accidents last year; the case will be discussed in more detail later. In the second, a general aviation aircraft drifted off the runway, fell into a ditch next to the runway and was seriously damaged. Factors contributing to the event included deteriorated weather conditions, which may have resulted in an unstable approach and an abnormal contact with the runway.

On the whole, the safety of general and recreational aviation has developed in a more positive direction in the past ten years, especially when assessing the number of fatal accidents. One turning point was the accident involving a skydiving plane in 2014, in which eight people died. After the accident, an extensive **project for developing the safety of recreational aviation** (page in Finnish) was started; different kinds of tools and support functions were developed in the project to ensure that things like the safety management of flying clubs and the attitudes of aviators would develop in a more safety-oriented direction.

Even though the situation as a whole has improved compared to the previous years, it is good to keep in mind that being satisfied with the safety level reached is not enough; safety must be created again every day.

Furthermore, in general and recreational aviation, the difference between a serious incident, an accident and a fatal accident is often paper thin.

For instance, in 2019 and 2020 there were clearly more accidents than on average, while there were fewer serious incidents, and people survived accidents without any fatalities.

In contrast, the number of accidents in 2021, 2022 and 2023 was clearly below the average, while the number of serious incidents was above it. Nevertheless, one person died in an accident each year.

Accidents and serious incidents are annually made proportional to the flight hour data collected from Finnish aircraft owners. The flight hour information for 2023,

the flight hour statistics, will be compiled during spring 2024. In 2022, the reporting activity level was low, and as a result, it is likely that there is a significant margin of error in the flight statistics for the year in question. According to the statistics, there were approx. 33,000 hours flown in general aviation and approx. 12,000 hours flown in recreational aviation in 2022. In the previous year when the reporting activity level was clearly higher, the figures were 45,000 and 22,000, respectively.

The preliminary estimate is based on the figures from last year as well as information on the operations at airports. Based on it, the number of hours flown in general and recreational aviation is unlikely to differ significantly from 2022. However, the estimated numbers may differ significantly from those that will eventually be recorded in the statistics, depending on the reporting activity level. Based on the current estimate, approx. 6.3 accidents took place in general aviation and approx. 16.7 accidents in recreational aviation per 100,000 hours flown in 2023.

The average for 2013-2022 was 8.9 accidents per 100,000 hours flown in general aviation and 23.9 accidents per 100,000 hours flown in recreational aviation. In other words, according to the preliminary estimate, last year was better than average, both in general as well as recreational aviation.

2.2 Fatalities

There was one fatality in aviation accidents in 2023. In July, a general aviation aircraft at an aerobatic show at the Selänpää aerodrome crashed to the ground and the pilot died. SIA initiated **investigation L2023-02** into the incident. The incident has been preliminarily classified as CFIT, but the cause will be specified when the investigation by SIA is complete.

In 2013-2022, an average of 1.3 fatal accidents have occurred per year.

The previous fatal accident took place in Tikkakoski in April 2022. The **investigation** by SIA into the accident in question was published in June 2023. The Tikkakoski accident was most likely caused by the engine stopping due to ice or condensed fuel that had accumulated in the carburettor or inlet manifold. In fact, icing is one of the most important things to take into account during the winter season. Traficom recently updated the **winter operation bulletins** so that they take the recommendations issued by SIA in the investigation into account.

This means that individual fatal accidents occur annually, but the situation has clearly improved from 2013-2014, when four fatal accidents occurred in each year, killing a total of 18 people. In 2013-2022 an average of 2.4 persons per year died in aviation accidents.

Even though the situation as a whole has clearly improved compared to the previous years, it is good to keep in mind that safety does not develop automatically; instead, it needs an active effort by everyone involved.

Browse accident statistics starting from 2005 using an interactive and updating report [here](#).

List of accidents in 2023 (incl. foreign aircraft in Finland)

1. April 2023: A combination of a glider and a towing aircraft encountered a downburst and heavy downpour that occurred rapidly in the area in Nummela at a low altitude after takeoff. The towing combination was unable to maintain the altitude, and the towing aircraft had to disconnect the glider being towed. The glider carried out an emergency landing in the forest soon after being disconnected. The glider was seriously damaged and the flight instructor and student pilot in the aircraft were injured.
2. July 2023: A general aviation aircraft carrying out an aerobatic show crashed down, killing the pilot. The cause of the incident will be updated when the investigation by SIA is complete.
3. August 2023: A general aviation aircraft drifted off the runway, fell into a ditch next to the runway and was seriously damaged. Factors contributing to the event included deteriorated weather conditions, which may have resulted in an unstable approach and an uneven contact with the runway.
4. September 2023: The oil temperature of an ultralight aircraft started to rise rapidly during a test flight. The pilot turned back towards the field, but the engine stopped and the pilot had to carry out an emergency landing in a stand of pine. The aircraft was damaged, but there were no serious personal injuries.

2.3 Serious incidents

There were 13 serious incidents in Finnish general and recreational aviation in 2023, which is below the average for 2013-2022 (15.9). Of the cases, nine occurred in general aviation and three in recreational aviation, and in addition, both a general and a recreational aviation aircraft were involved in one case.

In recreational aviation (ultralight aeroplanes, gliders) the number of serious incidents (4) was below the average for 2013-2022 (7.1). The types of incidents varied fairly widely, and there is no clear common contributory factor visible.

In general aviation, the number of serious incidents was 9, which was more or less on the level of the average for 2013-2022 (9.7). The situations occurred most commonly in connection with landing and led to a runway excursion or other damage.

There were also mid-air near misses. There were hardly any actual technical malfunctions among the incidents; instead, most often the situation was due to the pilot's actions.

Browse statistics on serious incidents starting from 2005 using an interactive and updating report [here](#)

List of serious incidents in 2023 (incl. Foreign aircraft in Finland)

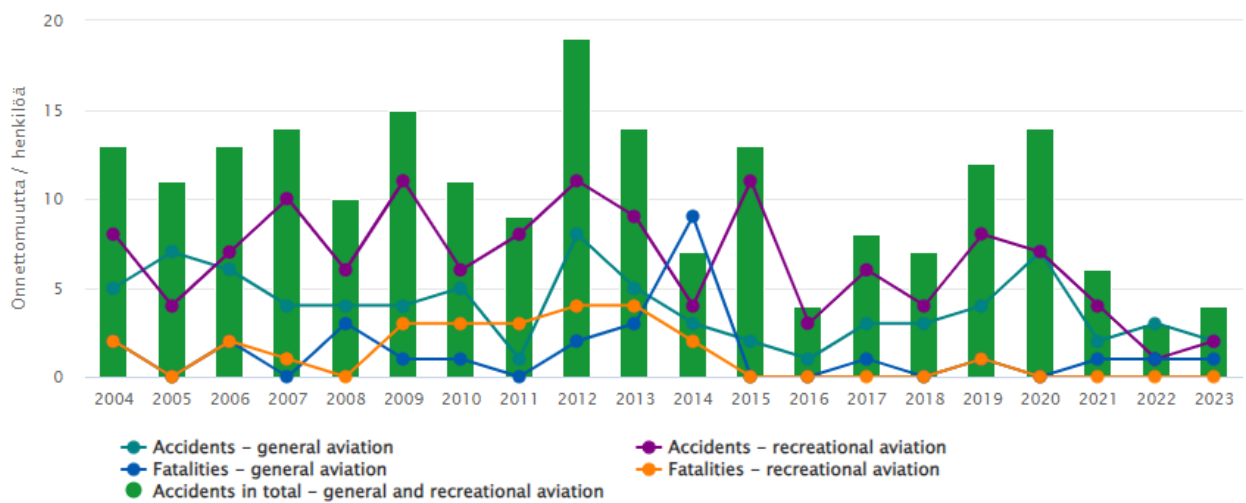
1. March: The ski of an experimental aircraft was damaged when it hit an icy spot under the snow during a landing on ice. As a result, the aircraft tilted forward, damaging its engine, but there were no more serious consequences.
2. April: During the landing run of an ultralight aircraft on ice, the nose wheel and the main landing gear sank down into the softened surface, rising up again on a supporting surface, after which during taxiing the nose wheel bent

down under the aircraft and the blades of the rotating propeller hit the ice. The propeller was damaged as a result.

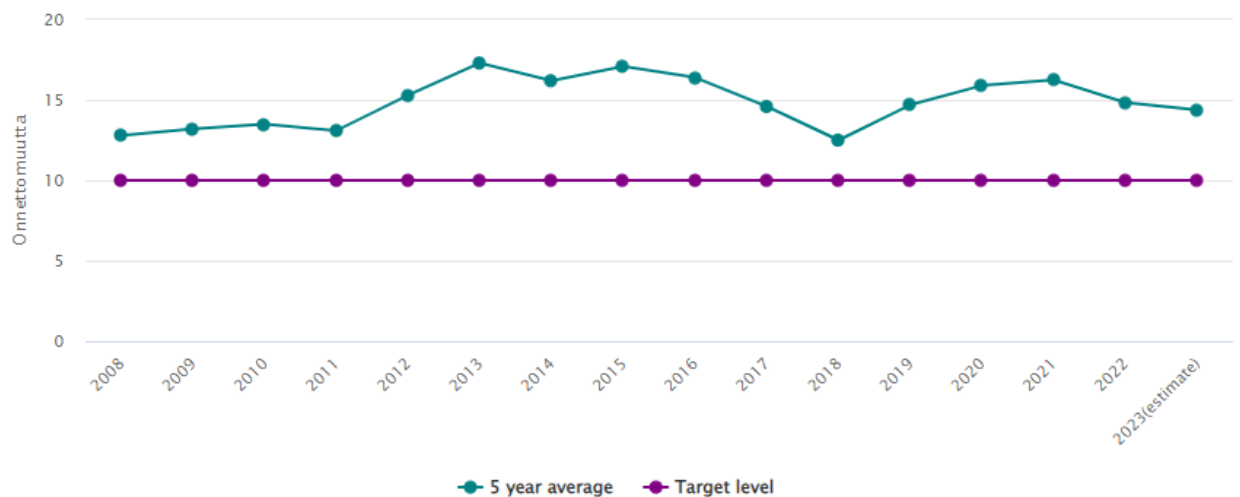
3. April: A near miss between a general aviation aircraft and a foreign small aircraft abroad in Slovakia.
4. April: A near miss between a general aviation aircraft and a foreign ultralight aircraft during a traffic circuit abroad.
5. June: A general aviation trainer aircraft made a hard landing, after which the aircraft slid off the runway. There was no damage, however.
6. June: During a training flight, a helicopter was hovering at the start of the runway at the same time as a glider was landing on the same runway. The helicopter pilots did not notice the landing glider, and the glider pilot only noticed the helicopter during the very short final part. A collision was avoided when the glider pilot took evasive action off the runway and passed by the helicopter at a distance of a few metres.
7. July: While an ultralight aircraft was in the cruise phase of the flight, the weather conditions deteriorated and the pilot decided to change the destination to the planned alternate airport. It was quickly discovered that the weather was poor there, too, and the weather conditions did not allow landing to the nearest airport, either. The weather conditions at Oripää Airfield were good enough for a landing. When arriving at the airfield, it was discovered that the runway was closed under a NOTAM due to an event in the airfield area. At that point, the amount of fuel was running so low that the pilot decided to land next to the runway in the area where paragliders were towed. The landing was successful and did not endanger others.
8. July: The reduction of altitude of a glider during an approach from high was not completely successful. During the final stretch, the aircraft remained slightly "on the shelf," which resulted in a hard landing, after which the aircraft veered to the left side of the runway and was mildly damaged.
9. July: At the end of a landing by a general aviation training aircraft in a gusty crosswind, a gust of wind raised the nose suddenly while the aircraft was tilted right, at which time the aircraft stalled at a low altitude and the right tip of the tailplane hit the runway.
10. September: In a spot landing during a refresher training flight of a general aviation aircraft, the pilot forgot to lower the retractable landing gear of the aircraft and the landing was done with the landing gear up. The damage remained relatively minor.
11. September: A general aviation aircraft ran out of fuel during the flight, and the pilot carried out a successful emergency landing on a grainfield after the autumn harvest without any major damage to the aircraft. Wrong interpretation of the units on the fuelhawk contributed to the incident (litres were interpreted as gallons). The fuelhawk had different units from the other aircraft of the club.

- 12. October: A general aviation aircraft drifted off the runway during takeoff, possibly due to the left wheel locking. Personal injuries were avoided, but the aircraft was damaged.
- 13. November: A general aviation aircraft drifted left during landing and hit a bump at the arrestor gear control unit at the edge of the runway and rolled 90 degrees from there to the grass. The propeller was damaged and the runway edge light was broken.

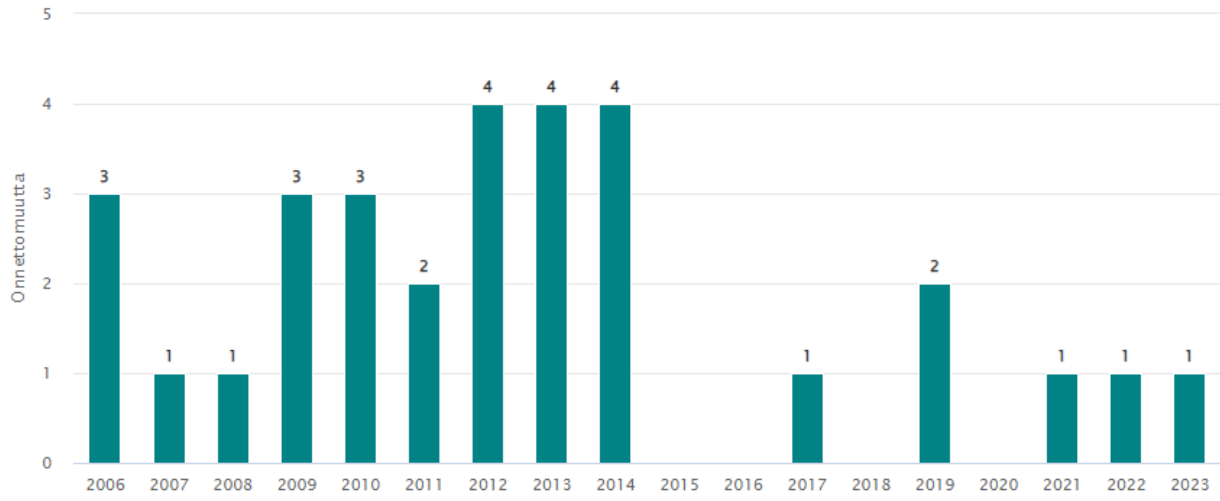
Accidents and fatalities



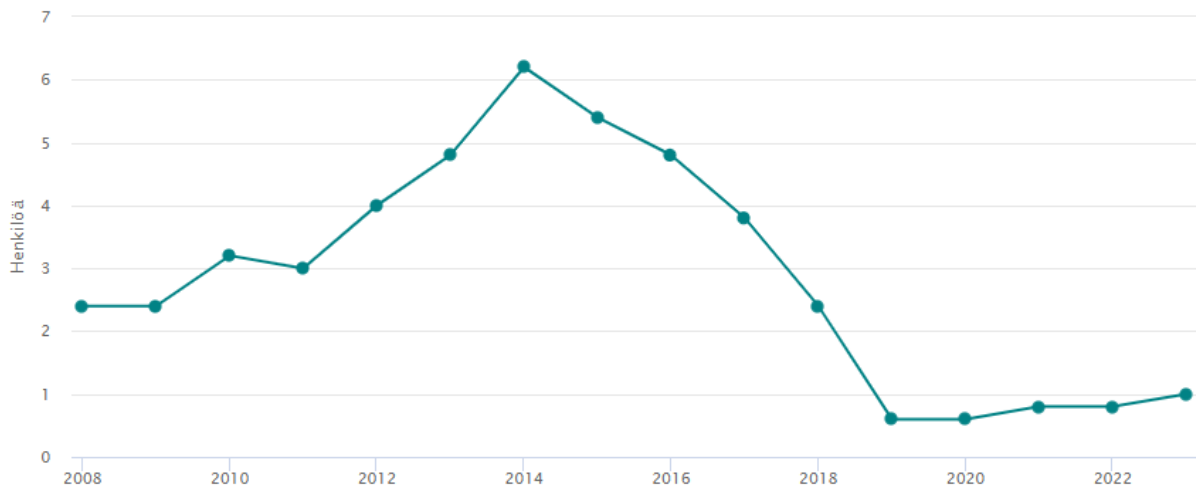
Accidents per 100 000 flight hours, 5 year average



Fatal accidents in general and recreational aviation



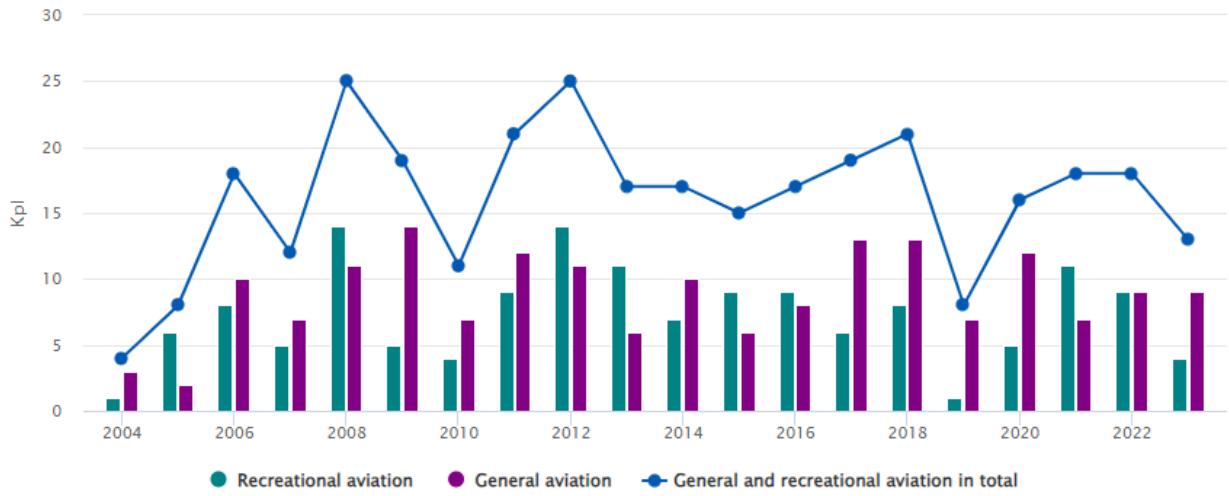
Fatalities in general and recreational aviation, 5 year average



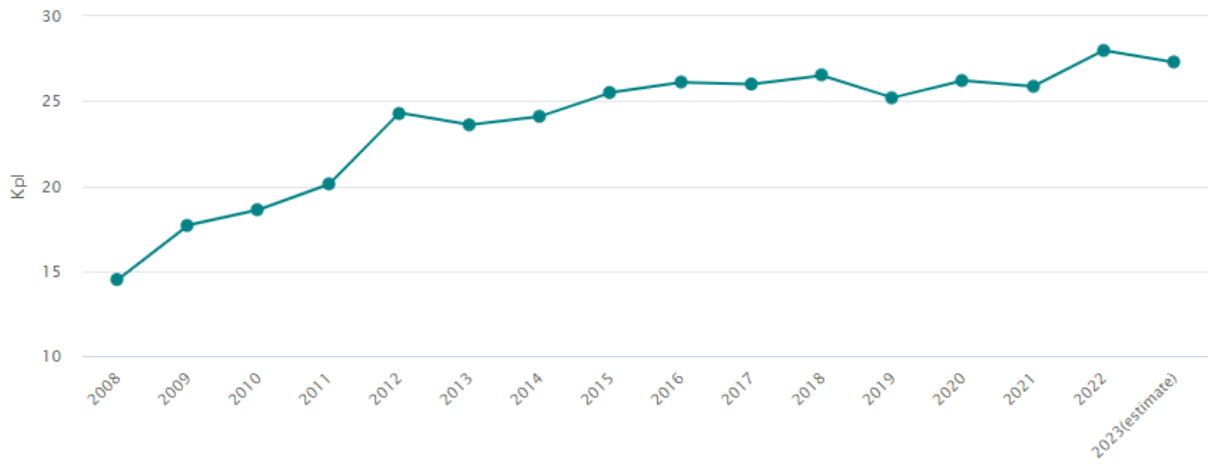
Fatalities in general and recreational aviation per 100 000 flight hours, 5 year average



Serious incidents in general and recreational aviation



Serious incidents in general and recreational aviation per 100 000 flight hours, 5 year average



3 Safety performance of other aviation domains

3.1 Air navigation services

Last year, the number of separation minima infringements with Finnish ATC contribution was 32.

The number was slightly below the average for 2013-2022 (34.9). In relation to the number of operations, however, the number of infringements of separation minima at airports was slightly higher than average. The separation minima infringements mostly took place at Helsinki Airport, as they typically did in the previous years, too. In relation to the number of operations, however, Helsinki Airport was more or less at the same level as the average of all airports.

Of the incidents, 14 were radar separation minima infringements between aircraft (slightly fewer than in the previous years), 12 were wake turbulence separation minima infringements and the rest were mainly infringements between aircraft and different types of controlled airspace. None of the events caused significant risk to air traffic. The overall situation of separation minima infringements remained fairly stable compared to the previous years.

The number of runway incursions with Finnish ATC contribution was five.

The number was the same as the average for 2013-2022 (4.7) and it was also average in proportion to the number of operations at airports. The events did not cause any significant risk.

In recent years, runway incursions with ATC contribution have been fairly rare. The situation has been discussed in more detail [in the section on runway incursions](#).

3.2 Aerodrome operations

In 2023, the number of runway incursions caused by ground vehicles at airports was 21.

The number was slightly higher than in the previous year, and it was above the average (15.1) for 2013-2022.

When made proportional to the number of operations at airports, the number was also higher than the average for 2013-2022. The largest numbers of runway incursions took place in Jyväskylä and Tampere-Pirkkala.

The decreasing trend of runway incursions ended in 2022, and the numbers remained at the same level in 2023. Typically, the largest number of runway incursions caused by ground vehicles take place in the winter months, and this was also true last year. Read more about the situation [here](#).

In addition to the cases at airports, one runway incursion caused by vehicles took place at an uncontrolled aerodrome in Oripää.

3.3 Ground handling

Ground handling did not cause any accidents or serious incidents during the year.

In the serious incident in July, when a child passenger nearly walked into the

rotating propeller of an aircraft, the ground handling personnel managed to intervene and prevent any serious consequences.

Cases related to ground handling services typically involve reports of different kinds of dents caused by ground handling equipment to aircraft, errors in weight calculations or deviations in connection with loading. These cases have been discussed in more detail **in the section on LOC-I**.

3.4 Drones

In 2023, there were eight near misses caused by a drone in Finland while the average for 2014-2022 was nine. None of these led to a serious incident. In previous years, an average of 1.9 cases resulted in a serious incident. In fact, the situation in Finland has been improving in recent years.

In contrast, the development abroad has been the opposite. There were 17 near misses caused by a drone with a Finnish aircraft as the other party. The number was more than triple the average for 2014-2022 (5.3). Last year, nearly all cases occurred in London. In three of the cases, the drone passed by so close to the aircraft that the situation was categorised as a serious incident. The number was roughly the same as in some previous years.

The ability of Traficom to influence matters is limited if the situation takes place abroad, but in such cases, the authority of the country in question is always notified about the events.

Most near misses in Finland and abroad involved a drone being flown clearly in the wrong place very near the runway while other aircraft were approaching it. Complete disregard or lack of understanding of aviation safety was evident in these cases. Even though there were no serious situations in Finland last year, the number of airspace infringements by drones was on the rise. Most of them were reported in the area of Helsinki Airport, but there were also cases around the rest of the country.

Airspace restrictions and the maximum permitted flying altitude can be easily checked by using the **drone map in the Aviamaps/Flyk application**, and in fact, it should be used before flying.

The situation will hopefully be improved by the Europe-wide regulation on drone activities that entered into force at the start of 2021, and positive development can also be seen at least in Finland. Due to the regulation, drone pilots are subject e.g. to a registration obligation and training requirements. New requirements on the classification markings of new drones placed on the market entered into force from the start of 2024. More information on regulations and drone activities can be found on the **www.droneinfo.fi/en pages** maintained by Traficom.

The number of reports by drone operators decreased slightly last year. However, many professional drone operators continued to be active last year in reporting situations that have occurred during their own activities, such as situations involving loss of control when the control connection has broken or when the device has collided with an obstacle, for instance.

4 Traficom's work to improve safety in 2023

In 2023, the focus of the Finnish aviation safety management measures continued to be on identifying the changes and threats to operations caused by the war in Ukraine and taking them into account in oversight and safety promotion. In 2022 and 2023, EASA developed its procedures for information sharing with aviation organisations concerning the development of situations in various conflict zones around the world. Traficom was also heavily involved in this effort.

During the year, Traficom updated Annex 1 to the **Finnish Aviation Safety Programme (FASP)**. The Finnish Plan for Aviation Safety (FPAS) 2023-2025 was published in April, and the implementation of measures described in it continued. FASP Annex 2, i.e. Finnish aviation safety performance targets and indicators, was updated in cooperation with aviation organisations after a break of a few years at the end of the year. The new version was published in January 2024. FPAS describes the current key safety measures by Traficom; a few of them have been highlighted below.

The development of the cyber security of aviation continued strongly last year; one of the focal points was preparing for the implementation of EU regulations on aviation cyber security (Part-IS). Monitoring was implemented and, among other things, the strategic situational picture of aviation cyber security was generated in cooperation with the major aviation operators. In addition, Traficom encouraged operators again to carry out a self-evaluation of their cyber security management performance with the help of the Kybermittari service developed by the National Cyber Security Centre Finland. Traficom also published and updated **web pages on aviation cyber security**.

The benefits of the preventative risk management that has already been carried out for a long time became apparent during the year, when many of the previously identified threats became reality, but the preparations for them were already in place.

The last remaining measures related to the management of the coronavirus pandemic were ended at the start of 2023. Due to the coronavirus pandemic, aviation organisations, aviation authorities as well as other authorities had to update their processes related to the management of infectious diseases and make them more efficient. There were also many lessons learned from the pandemic, and there are better preparations in place in case of a potential similar situation.

At the start of the year, Traficom adopted a renewed national aviation safety risk management process and the related risk portfolio tool software. The renewal of the process brought the management of safety risks by the authority into an increasingly integral part of the everyday work of Traficom's teams. Joint risk workshops were held again together with aviation organisations; they gave the organisations an opportunity to participate in national safety risk management.

During the year, Traficom published six **safety bulletins**. The winter operations bulletin for foreign airlines flying to Finland that has already become traditional was published in the autumn; in addition, a separate version was published for operators in general and recreational aviation. The two winter operation bulletins were again translated into English and communicated widely to foreign operators. In addition, Traficom communicated about matters such as the increase in the number of unruly air passengers and the passengers' own responsibility for their

behaviour during the flight, as well as avoiding setting off fireworks close to airports and aerodromes.

The annual **Lentoon! seminar** (in Finnish) for operators in general and recreational aviation was arranged as an in-person event in cooperation with the Finnish Aeronautical Association (SIL, responsible for the arrangements last year), Fintraffic ANS, Finavia, the Finnish Meteorological Institute, and AOPA Finland (SMLL).

You can find more information on aviation safety, such as links to the safety bulletins published by Traficom and other sources of safety information, at **[Traficom's website on aviation safety information](#)**.

5 Flight safety reporting

Open reporting of occurrences and fair processing of the reports has always been seen as one of the mainstays of aviation safety. When the threshold for reporting is low, a more accurate picture of the development needs in the operations can be obtained, and safety can be improved more effectively. A large number of reports can be regarded as a sign of a good safety culture. The Just Culture principles are followed in Finland when processing Air Safety Reports. For a more detailed description of how the reports are processed, see Chapter 2.5 of the Finnish Aviation Safety Programme (External link).

In 2023, approximately 18,000 Air Safety Reports were sent to Traficom. The number was nearly 8,000 reports higher than in the previous year and approximately 2.5 times the average of the years 2013-2022 (approx. 7,200 reports).

The biggest reason for the significant growth of the number of reports was the increased reporting of GPS interference abroad. At the same time, the number of occurrence reports concerning issues other than GPS interference also increased by more than one thousand compared to the previous year.

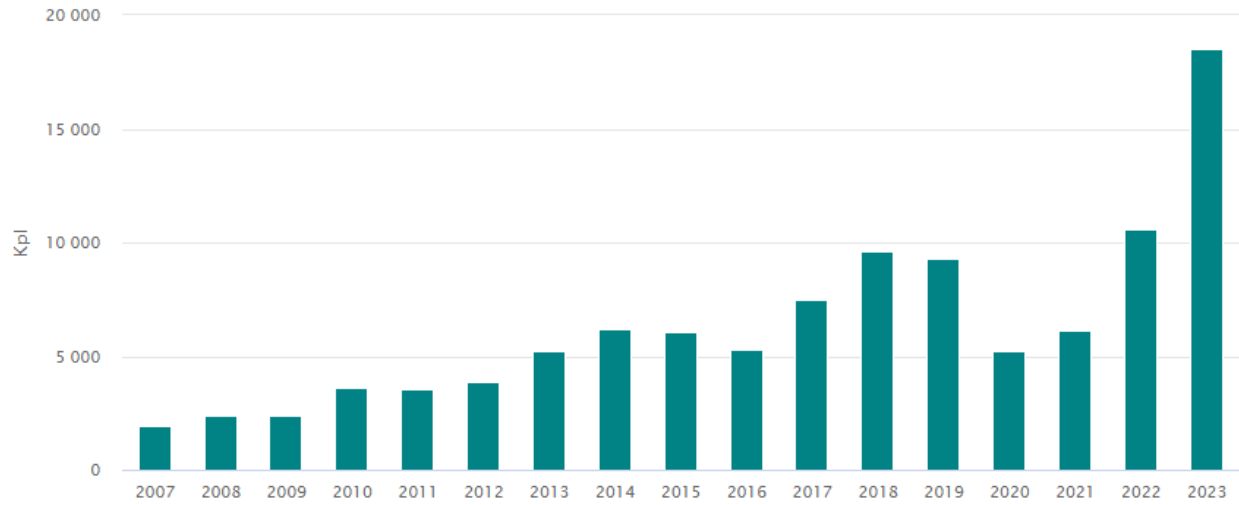
The level of reporting activity can be estimated by making the number of reports proportional to the volume of aviation activity. At the moment, only the operation volumes at airports are available for last year, and even if those figures do not always provide a complete picture of all aviation activities, they can nevertheless be used to estimate the development of the situation on a general level. Last year, approx. 6,600 reports per 100,000 operations at airports were received, while in 2022 the same figure was approx. 3,900 reports.

If reports of matters other than GPS interference are studied, the number was approx. 4,000 per 100,000 operations last year and approx. 3,400 in 2022.

This means that the number of reports clearly increased again last year. At the same time, however, the aviation safety situation remained at a good level. It can be stated that the reporting activity of Finnish aviators and organisations has continued to develop in a positive direction.

Based on information received from the European Union Aviation Safety Agency EASA, too, in 2021 Finland had the best level of reporting activity in all of Europe when the numbers of reports were made proportional to the number of IFR operations, i.e. flights carried out in accordance with the instrument flight rules (IFR operation numbers were the only available proportional data based on which the reporting activity of different countries can be indicatively compared).

Flight safety reports

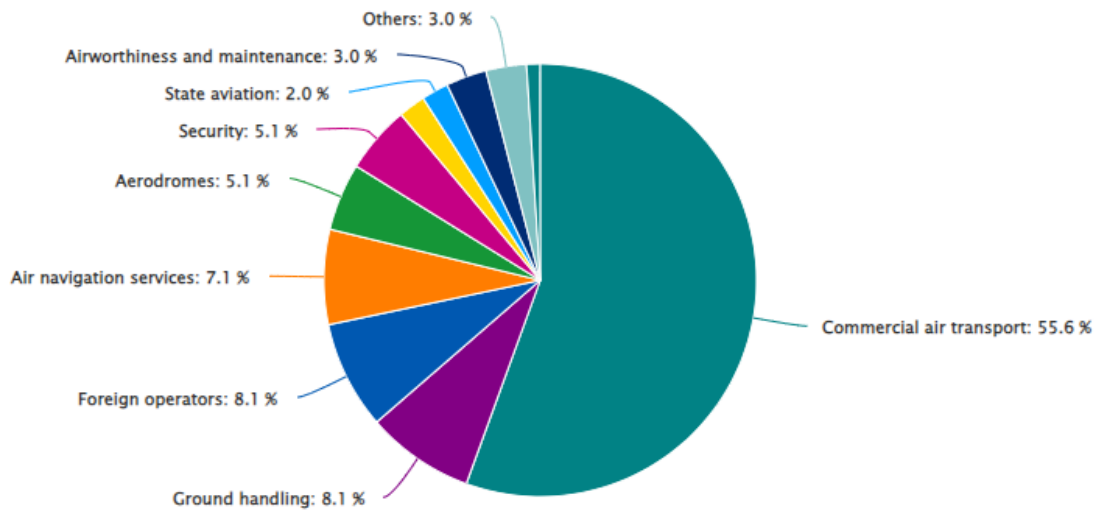


Number of reports per month since 2013



The reports are classified on the basis of several different variables. The graph below shows the distribution of incidents in 2023 based on the aviation domain in which the reported incident occurred. Most of these reports concern commercial operations and are received from flight operations and different ground organisations.

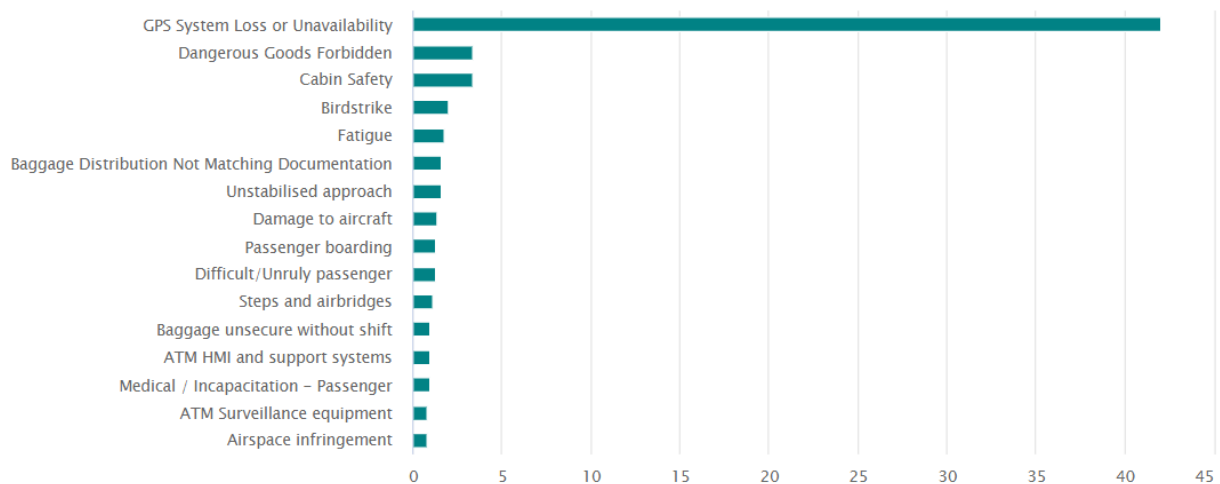
Reports by aviation domain



The following graph shows the top 15 event types of 2023 occurrences, shown as percentage of total.

Event types are based on the Europeanwide ECCAIRS-taxonomy. You can find all the event types in the taxonomy here (External link)(folder path events/all attributes/event type/values).

Top 15 event types in 2023, as percentage of total



6 Runway excursions (RE)

In 2023, seven runway excursions that occurred in Finland or involved Finnish aircraft were reported. The number was slightly below the average for 2013-2022 (8.7). One of the cases was classified as an accident and five as serious incidents; these figures were also more or less at the level of the long-term average.

Overall, the year largely resembled the previous ones with regard to runway excursions. However, the number of runway excursions has been slightly decreasing as of 2015.

Most of the cases last year occurred in general aviation (4). Two runway excursions occurred in recreational aviation. In addition, in military aviation two Hawk jets drifted off the runway after landing in Jyväskylä in January. The number of cases in general aviation remained at the level of the average for recent years. In recreational aviation, the figure was below the average. In an accident, a general aviation aircraft fell into a ditch next to a grass runway after an unstable landing and was seriously damaged.

Most of the cases last year occurred in connection with landing during the summer. This has also been typical of the previous years. Contributing factors often include a sudden change in the force or direction of the wind, or crosswind conditions, when a pilot cannot compensate sufficiently for the effect of the crosswind (or a gust of wind). Most of the cases last year occurred at uncontrolled aerodromes.

6.1 Event types contributing to runway excursions

Situations to be monitored that may contribute to runway excursions include e.g. unstable approaches, malfunctions in landing gear and thrust reversers, take-offs interrupted at a high speed, hard landings or other abnormal contact with the runway as well as cases in which insufficient information has been provided about the condition of the runway.

Of these types of situations, **landing gear and thrust reverser malfunctions** were reported in numbers higher than the long-term average. There were 59 cases, when the average for 2013-2022 was 41. Most of the cases occurred in commercial air transport or general aviation. Three cases led to a serious incident in general and recreational aviation. In two of the cases, a landing gear was damaged when the aircraft landed on snow-covered lake ice.

The number of **abnormal contacts with the runway**, such as hard landings, longer landings than normal or tailstrikes, in which the tail of the aircraft hit the runway, was above the long-term average.

Most of the cases occurred in commercial air transport and general aviation. The places in which the situations occurred varied between different airports around Finland and the world. Contributing factors included weather conditions on the one hand, such as sudden downdrafts, but on the other hand, an equal number involved mistakes made by pilots during landing. None of the cases led to an accident, and in this respect the year was better than average. Five cases led to a serious incident, all of which took place in general or recreational aviation. This

number was slightly above the average. In the last few years, an increase in tail-strike situations related to abnormal contacts has been visible.

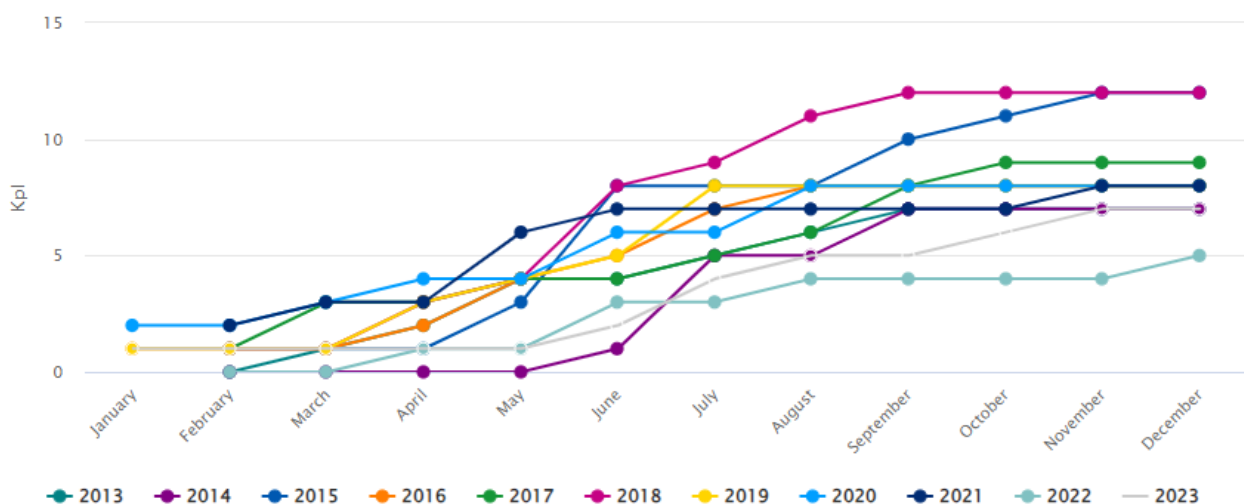
There were also 26 cases in which **insufficient information about the condition of the runway had been provided to aircraft**, which is clearly more than the average in 2013-2022 (14.1). These cases involved situations in which e.g. according to the opinion of the crew of an aircraft or the values provided by the aircraft system, the runway was more slippery than officially reported. Most of the cases were reported in January. The largest number of cases occurred in Rovaniemi, Kittilä, Helsinki and Kajaani. In cases such as these, the airport maintenance carries out a new measurement on the runway and changes the reported values as needed or takes up measures to improve the condition of the runway.

Traficom regularly publishes winter operations bulletins for both foreign airlines flying to Finland and general and recreational aviators. The bulletins for last year were updated in early October, and they can be found [here](#) (page in Finnish; winter operations bulletins in English). EASA held Winter Readiness webinars from 9 to 10 August 2023; their recordings can be found [here](#). They also discussed runway winter maintenance from different perspectives.

Another good resource that includes a number of recommendations is the **European Action Plan for the Prevention of Runway Excursions (EAPPRE)** published by Eurocontrol already back in 2013.

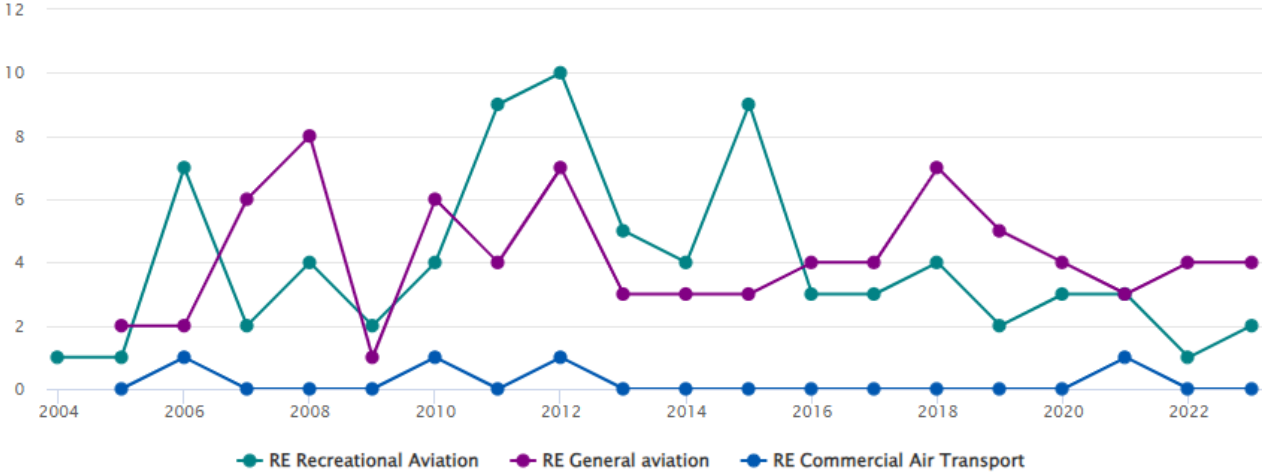
Also see the **GAPPRE (Global Action Plan for the Prevention Runway Excursions)** whose aim is to prevent runway excursions globally.

Runway excursions



Runway excursion (RE) per aviation domain

Does not include drones, state aviation or foreign aircraft



7 Runway incursions (RI-VAP)

In 2023 in Finland, there were reports of 59 runway incursions, meaning cases where an aircraft, vehicle or person is incorrectly present on the runway or its protected area. The number was more or less at the level of the average for 2013-2022 (59.1). However, when made proportional to the number of operations at airports, there were more runway incursions than on average.

One of the cases last year was classified as a serious incident. The number was below the average of the previous years. The situation in question occurred between a helicopter and a glider at an uncontrolled aerodrome. Runway incursions have not caused accidents in Finland.

A runway incursion is defined as any situation where an aircraft, vehicle or person is present on the runway or its protected area, without clearance or otherwise incorrectly. An uncontrolled aerodrome has no air traffic control that would give aircraft clearance to enter the runway. Situations at uncontrolled aerodromes have also been classified as runway incursions when the conclusion is that another aircraft, vehicle or, as in this case, person has entered the runway in a significantly incorrect way.

7.1 Aircraft

There were 31 runway incursions by aircraft in Finland last year. The number was below the average for 2013-2022 (36.6). In fact, the overall number of runway incursions by aircraft has been decreasing slightly during the last decade.

Most of the incursions last year occurred in general or military aviation, but the numbers remained at the level of the average or slightly below it. In recreational aviation, the number of runway incursions clearly increased compared to the previous year but remained at the level of the long-term average. Runway incursions are rare in commercial air transport, and last year there were two of them, which was at the same level as in the previous years and below the average.

Last year the situations occurred fairly evenly between airports and uncontrolled aerodromes, but most cases occurred in Jyväskylä, Rovaniemi and Kuopio. In most cases an aircraft took off or landed without appropriate clearance.

The participants of the only serious incident of the year were a general aviation helicopter and a recreational aviation glider, and it took place at an uncontrolled aerodrome in Hyvinkää. In the case in question, a helicopter on a training flight was hovering at the start of the runway at the same time as a glider was landing on the same runway. The helicopter pilots did not notice the landing glider, and the glider pilot only noticed the helicopter during the very short final part. A collision was avoided when the glider pilot took evasive action off the runway and passed by the helicopter at a distance of a few metres.

7.2 Vehicles

Last year, vehicles caused a total of 21 runway incursions at airports. The number was a bit higher than last year and above the average for 2013-2022 (15.1). In relation to the number of operations, too, the number of situations at airports was clearly higher than average.

Most of the cases occurred in January-February as well as November-December. The largest number of cases took place in Jyväskylä and Tampere-Pirkkala. During the winter, maintenance often needs to clean the runway. In many runway incursions, requesting permission needed for such an activity was forgotten for some reason or another. In some cases, one vehicle was already brushing the runway and another joined it without appropriate runway clearance. In some cases at regional airports, the cut ATC opening hours contributed to the drivers' loss of related situational awareness, meaning that they forgot to request runway clearance.

The number of runway incursions by vehicles was still decreasing at a good rate in 2021, but the number started to rise again in 2022 and the increase continued last year, too. Airports have taken or intend to take various measures to improve the situation.

7.3 Persons

In 2023, individuals caused three runway incursions. The average for 2013-2022 was 15.1. The situation has indeed been improving in the past few years.

All of the cases occurred at uncontrolled aerodromes where the boundaries of the area are difficult to monitor. Last year, the locations were Nummela and Immola. In fact, in recent years most of these cases have occurred at the Nummela aerodrome. For example, in one of the cases in Nummela last year, there were three people walking their dogs in the runway while an aircraft was landing. However, the pilot noticed the walkers early enough and managed to perform a go-around in time.

In order to prevent such situations, the aerodrome operator's tools include placing warning signs in critical locations in the aerodrome and providing information e.g. in local papers. Physical protection (e.g. gates or fences) may also be used as possible.

7.4 Air traffic control

In 2023, ATC contributed to five runway incursions. The number was more or less the same as the average for 2013-2022 (4.7) and it was also average in relation to the number of operations at airports. The events did not cause any significant risk.

Most of them occurred at Tampere-Pirkkala. In 2013-2022, such situations have taken place most often at Helsinki Airport, Tampere-Pirkkala or Jyväskylä, but there is a large annual variation between the locations.

In recent years, runway incursions with ATC contribution have been fairly rare.

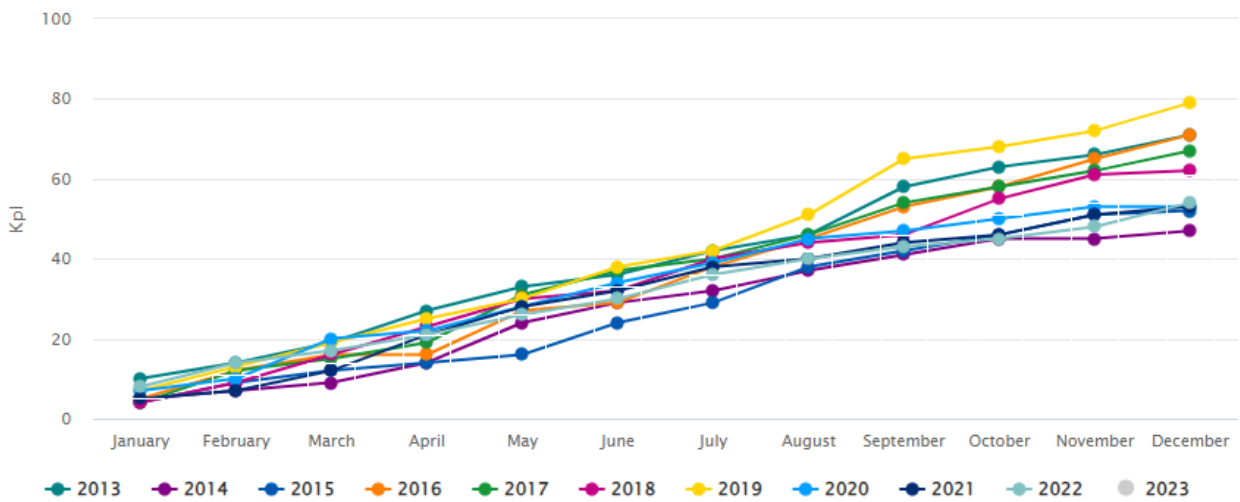
7.5 Traficom's work to reduce number of runway incursions

Traficom has published a number of safety bulletins concerning runway incursions over the years. In 2013, **an information letter** (PDF, in Finnish) was sent to all aviation licence holders, and in November 2018 **a safety bulletin** (in Finnish) was published, which reminded the operators about typical cases of runway incursions. A **safety bulletin** (in Finnish) that was published in October 2019 discussed the events of summer 2019, including runway incursions. **A safety bulletin** (in Finnish) was also published in June 2020 which handled themes such as

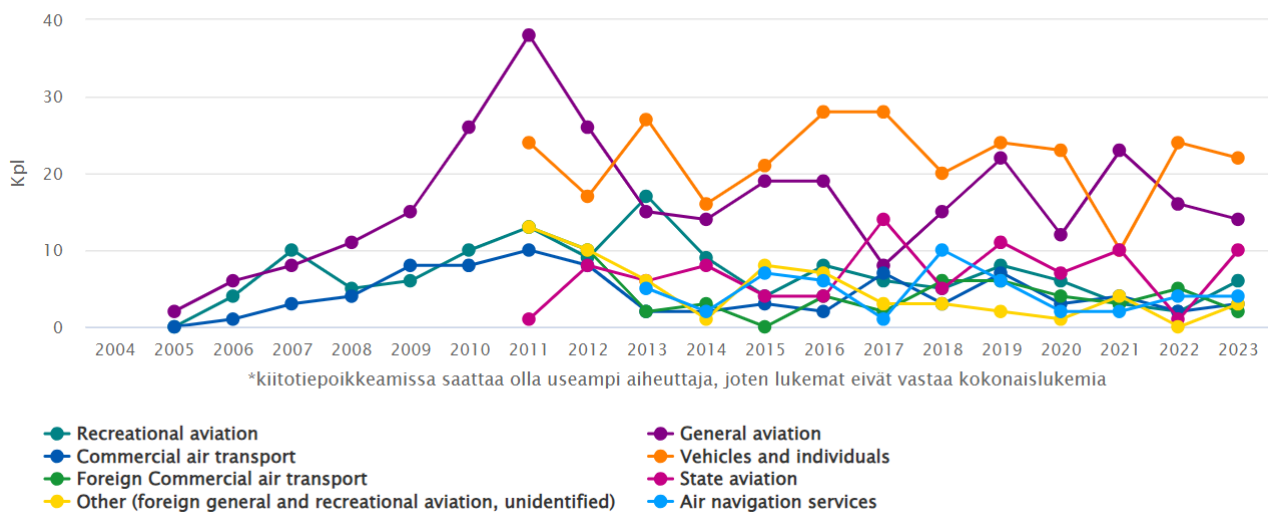
runway incursions. The bulletins still contain useful tips for avoiding runway incursions.

The **European Plan for Prevention of Runway Incursions (EAPPRI)** was updated by the European aviation organisations in late 2017. EAPPRI contains numerous recommendations, and all parties should thus go through this document and attempt to implement its recommendations as far as possible. Traficom conducted a survey on the status of implementing the recommendations in Finland in September 2018. According to the answers, about 80% of the EAPPRI recommendations had been implemented or are going to be implemented.

Runway incursions



Runway incursions (RI) by aviation domain



8 Near misses and collisions in the air (MAC/Airprox)

In 2023, 68 near misses in the air that occurred in Finland or involved Finnish aircraft abroad were reported. This was above the average for 2013-2022 (54.2).

If we only examine the situations that occurred in Finland, however, the number (38) was slightly below average (41.7). This means that 30 situations occurred abroad, which is clearly above the average of 18.1. Most of these were caused by a drone that was flown in the wrong place.

No actual collisions occurred in any of the situations, but in five cases the aircraft came so close to each other that the event was classified as a serious incident. The number of such cases was slightly below the long-term average (6.1). All of the cases occurred abroad, and the number was more than double the average for 2013-2022 (1.8).

This means that no near misses happened in Finland that would have led to a serious incident. This was quite exceptional, because in 2013-2022, an average of 4.8 such situations occurred in Finland per year.

8.1 Commercial air transport

Finnish commercial air transport was a party to 45 near misses in total during 2023. This was above the average for 2013-2022. Of the cases, 20 occurred in Finland and 25 abroad. Especially abroad the figures were clearly above the long-term averages.

Most of the situations in Finland took place at Helsinki Airport. Most of them were caused by separation minima infringements with ATC contribution. However, the number of cases at Helsinki Airport was at the same level as the average in the previous years.

None of the cases in Finland was classified as a serious incident. In previous years, there have been 1.5 near misses classified as serious incidents in Finland on average.

Abroad, situations occurred most often in London with a drone flown in the wrong place as the other party. Three of these cases were classified as serious incidents, which was roughly the same number as in the previous years. The number of situations that occurred in the United Kingdom last year was significantly above average. Elsewhere abroad, the number of situations was more or less at the same level as the average in the previous years.

8.2 General and recreational aviation

Finnish general and recreational aviation was involved in 16 near misses. The number was more or less at the level of the average for 2013-2022 (17.1). Of the cases, 13 took place in Finland and three abroad. Both numbers were slightly below average. Two of the cases were classified as serious incidents, and they took place abroad, in Spain and Slovakia, during the second quarter. This means that no near misses classified as a serious incident were reported in Finland, which can be considered as very exceptional. In previous years, an average of three near misses classified as a serious incident occurred in general and recreational aviation in Finland.

When most of the situations in commercial air transport took place at Helsinki Airport, in general and recreational aviation near misses occurred fairly evenly all around Finland. None of them occurred at Helsinki Airport, where in fact very little general or recreational aviation takes place. Many of the cases occurred at uncontrolled aerodromes, like in the previous years.

The importance of correct situational awareness is highlighted at uncontrolled aerodromes without ATC to control traffic. Being seen and heard was highlighted as a special theme of safety work in recreational aviation in Finland in 2023. More information on the topic is available in the **presentation materials** (in Finnish) of the Lentoon! seminar this year.

The safety bulletin (such as **this one** (in Finnish) from the summer of 2020) has also identified the most typical causes of near misses and considered measures to avoid them, one of the most important of which is maintaining situational awareness: "The building blocks of situational awareness include trusting the others to also follow the common rules, listening to the radio frequency of the aerodrome and talking on it, and naturally also keeping your eyes open and observing the airspace."

Abroad, most of the near misses occurred in Spain during various training flights. In previous years, too, most of these situations have taken place in Spain. The total number last year was slightly below average.

8.3 Drones

In 2023, drones caused eight near misses in Finland. The number was more or less at the level of the average for 2013-2022 (8.9). A typical case involved flying a drone too high in the airspace of Helsinki Airport. However, none of the cases last year caused a serious incident for manned aviation.

In Finland, the number of near misses caused by drones has been decreasing in recent years, which is positive. It is also true that in 2023, drones were flown without permission in controlled airspace more often than in previous years. Near misses were usually avoided, because no other aircraft happened to be nearby. You can find a more detailed review of the situation of airspace infringements **here**.

In Finland, the situation has been improving in recent years, but abroad it has developed in the opposite direction.

In 2023, drones caused 17 near misses with Finnish aircraft abroad. The number was more than double the average for 2015-2022 (6.9).

Most of the cases were reported near London, and three of the cases in the year were classified as serious incidents. The number of serious incidents was also above average. In previous years, London was not a hot spot of near misses, but in 2023, approximately 70% of all situations abroad were reported from there. Most cases were clearly the result of intentional actions, including flying a drone e.g. very close to an airport or at a considerable altitude.

8.4 Air traffic control

The number of separation minima infringements with ATC contribution (not including wake turbulence separation minima infringements or separation minima

infringements between an aircraft and airspace) in Finland in 2023 was 12. The number was below the average for 2013-2022 (17.2), and it was also below average in relation to the number of operations. Most of them took place at Helsinki Airport, but the number was also below average.

Most often the separation minima infringements took place during the approach, when the distance between two aircraft approaching one after another fell below the minimum distance. However, the infringements were fairly minor in all cases.

8.5 Event types contributing to near misses

In addition to the **airspace infringements** described in more detail in a separate section, other situations to be monitored that may contribute to near misses include clearance altitude violations (level busts), lateral deviations from the route, transponder malfunctions and incorrect reactions to a TCAS command.

In Finland, clearance altitude violations or level busts were reported in 48 cases in 2023, which is slightly more than the average for 2013-2022 (45). Most of the violations were reported again in military aviation (16), as typically in previous years, too. However, in 2023 the number was halved compared to the previous year, meaning that the situation improved. The number of cases in military aviation was now at the same level as the average for recent years. The number of violations by foreign military aviation in Finland (5) increased compared to the previous years, when only single cases of this type had occurred.

In civil aviation, clearance altitude violations occurred 34 times, which is slightly more than in the previous year and above the average (28). Typically in these cases, a commercial air transport aircraft descended below the clearance altitude set by ATC at some point during approach.

In Finland, most clearance altitude violations occurred at Helsinki Airport or Rovaniemi.

Abroad, Finnish aircraft were involved in 22 level busts. The number was slightly above 15.2, the average of previous years. Violations occurred fairly evenly in different parts of the world.

As in previous years, a common factor contributing to the clearance altitude violations seems to have been an inadvertent error in the cockpit. For example, pilots may have forgot that they do not have appropriate clearance from ATC prior to climbing or descending from the cleared altitude.

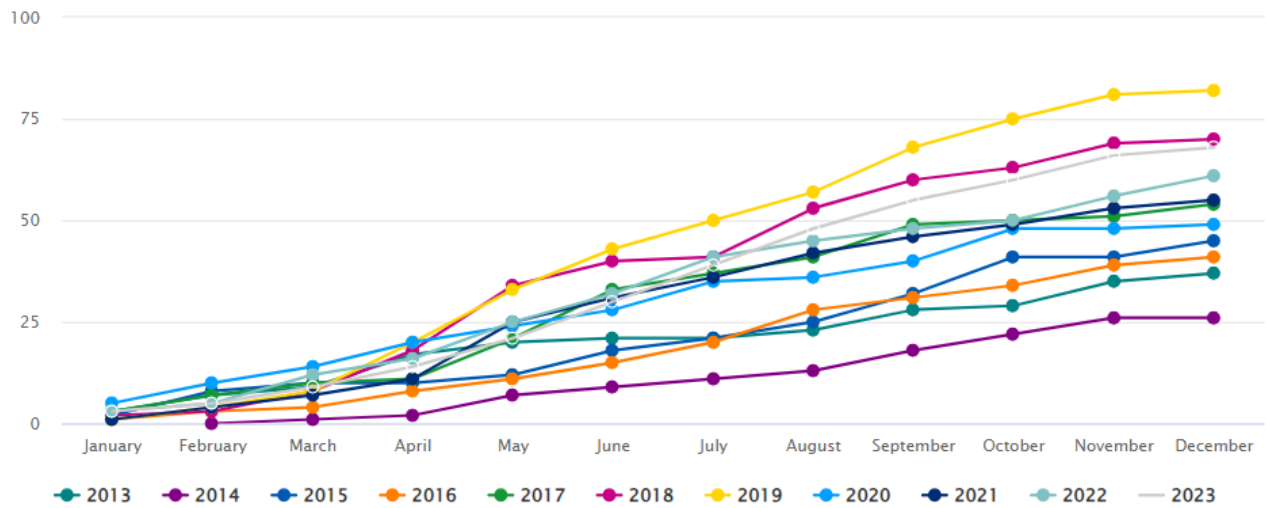
Lateral deviations from the route in Finland or involving Finnish aircraft were reported in 99 cases in 2023. The number was clearly above the average for 2013-2022 (58.7).

There were 57 cases in Finland, which is above the average (45.8), but the situation has nevertheless remained fairly stable in recent years. In most cases, the deviation occurs either during the route or approach phase of the flight. A typical situation occurred either in Finnish or foreign commercial air transport, when the final approach track was not followed during approach according to the clearance, or for instance a wrong waypoint was selected in the aircraft system.

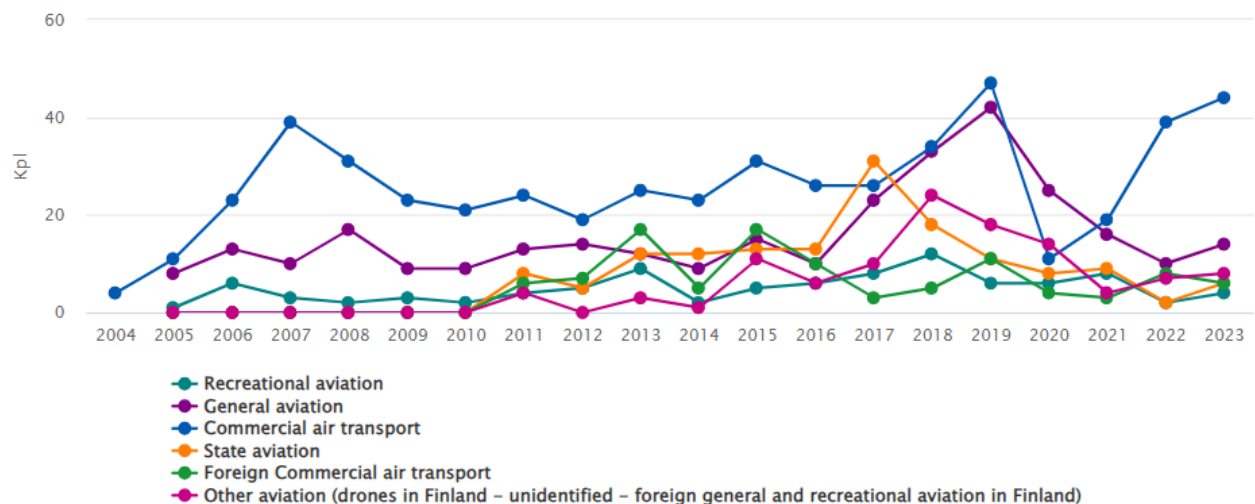
In Finnish commercial air transport operations abroad, clearly more of such situations were reported than the average of the previous years. The situations were not focused on any specific location; instead, they occurred fairly evenly around the world. The situation often occurred either during the approach (the localiser was not followed during approach as cleared) or during takeoff and the initial takeoff (incorrect SID or standard instrument departure route was entered into the aircraft's systems).

Transponder malfunctions or incorrect operation, such as setting the wrong transponder code, was reported in 30 cases in 2023, which is above the average of 2013-2022 (18.2). Most of the cases last year seemed to apply to a certain type of helicopter in Rovaniemi and the visibility of its transponder in the ATC systems. If this particular aircraft type is excluded, the numbers were more or less at the same level as in the previous years.

Airprox/near miss situations



Participants in mid-air collision or near misses (MAC/Airprox) by aviation domain



8.6 Airspace infringements

There were 129 airspace infringements reported in Finland in 2023. This was below the average for 2013-2022 (150.3). In relation to airport operations, the number was slightly above the average. The number of airspace infringements decreased clearly compared to the previous year by approx. 30 cases.

8.6.1 *Controlled airspace*

Last year, 104 infringements of controlled airspace were reported. The number was slightly below the average for 2013-2022 (110.4). The infringements did not cause major consequences for other traffic.

Most of the cases (30) took place in the airspace of Helsinki Airport, but the number was below the average of the previous years. Other popular destinations included Tampere-Pirkkala, Turku and Jyväskylä. The numbers were below the average except for Tampere-Pirkkala, where they were above it.

Most of the airspace infringements were caused by general aviation, as in the previous years. However, the numbers remained clearly below the average. The airspace infringements in general aviation focused mainly on Helsinki Airport, Tampere-Pirkkala and Pori. The numbers in recreational aviation were lower, but an increase could be seen in them compared to the previous years. In 2023, however, the number still remained at the average. The cases in recreational aviation also focused most often on the airspace of Helsinki Airport.

The second highest number of airspace infringements after general aviation was caused by drones, and it was also above the average. The number of cases caused by drones was at its highest in 2018, but started to decrease clearly after that. Since 2022, the number has been increasing again. Most of the cases occurred at Helsinki Airport, and a few of them were fairly blatant violations, in which the drone was flown in the airport area. Drones were also flown without permission near aerodromes in Northern Finland, especially in Ivalo last year.

Typical reasons for airspace infringements in general aviation include navigation errors causing a flight to enter the terminal control area either from below or laterally. In drone operations, very few operators themselves report about flying in controlled airspace, so there is very little information about the causes of airspace infringements in drone operations. The reports mainly come from manned aircraft pilots or ATC.

8.6.2 *Prohibited areas*

Airspace infringements can occur to prohibited areas which have been set up e.g. around nuclear plants.

In 2023, there was not a single report of an airspace infringement in a prohibited area. There have been approx. three of such cases per year on average in the previous years, which means that last year went exceptionally well. In previous years, typical areas included the prohibited area P15 above the Olkiluoto nuclear power plant and the prohibited area P20 above the Loviisa nuclear power plant.

8.6.3 Restricted areas

Airspace infringements can occur with restricted airspace set up to protect aviation from dangerous activities, such as shooting or blasting.

In 2023, aircraft were flown in restricted areas without permission 17 times. The number was below the average for 2013-2022 (21.8). The numbers have clearly decreased compared to the top figures in 2020, when aircraft were flown in a restricted area 34 times.

The violations last year focused on a variety of restricted areas around Finland. In previous years, aircraft have been flown most often into the restricted area R64 Santahamina in front of Helsinki, the Hanko R83 Syndalen area as well as the areas R73 Pohjankangas and R113 Huovinrinne close to Pori.

8.7 Airspace infringement monitoring and further information

Airspace infringements into controlled airspace increase the likelihood of a collision between aircraft. At the same time, unauthorised flying into a restricted area where shooting, blasting or other activities dangerous to aviation take place is an obvious risk to an individual aircraft. The purpose of prohibited areas is to protect nationally important targets, such as government buildings and nuclear plants.

In addition to restricted and prohibited areas, danger areas (D) can be published for situations where busy aviation activity, unmanned aviation beyond visual line-of-sight or other operations dangerous to aviation take place and need to be communicated due to aviation safety. However, a danger area can be flown into without a separate clearance at the pilot-in-command's discretion, meaning that they do not restrict the use of airspace as the restricted and prohibited areas do. In such cases, it is nevertheless preferable to discover the nature of the activity and how to contact the body that has reserved the area before flying into it.

Prohibited areas are continuously active. Other airspaces are activated as necessary (e.g. controlled airspace is activated when an airport has aviation activity, and a restricted airspace is activated when the dangerous activities begin). The restricted and prohibited areas can be temporary or permanent.

A more detailed situation review of airspace infringements with information about preventing them was included in the **[safety bulletin published in April 2022 \(in Finnish\)](#)**.

Browse airspace infringement cases in more detail on the interactive, updating report at **tieto.traficom.fi**.

9 Loss of control in flight (LOC-I)

In 2023, 15 cases of loss of control in flight were reported. The number was below the average of 2013-2022 (18.3) and roughly one half of the number of the previous year. Most of the cases occurred in drone operations, as in the previous years.

In manned aviation, there were six losses of control reported, which was slightly below the average for 2013-2022 (7.6). The situations occurred in recreational aviation, commercial air transport and general aviation. One of the cases was classified as an accident and one as a serious incident. As for the accidents, their number was clearly below the average of the previous years (approx. 5), and more or less at the average concerning serious incidents.

In commercial air transport, LOC-I cases are rare. Two situations of this kind occurred during the year. They involved a very brief loss of control due to a sudden downdraft in or close to a thundercloud.

In general and recreational aviation, there were four LOC-I cases, which is below the average for the years 2013-2022 (6).

One of the cases led to an accident, when the control of an ultralight was lost due to the motor shutting down and the pilot had to carry out an emergency landing in a stand of pine. Another was classified as a serious incident, in which the wing of a general aviation aircraft on a test flight struck the runway after a sudden gust of wind tilted the aircraft.

In general and recreational aviation, the number of LOC-I cases has been decreasing for a long time. This is a good trend for overall safety, because LOC-I situations often lead to accidents. The collision energy in these type of accidents is high, which means that they often lead to loss of human life.

The **investigation** by SIA into the fatal accident during an aerobatic show in Selänpää last year is still ongoing. So far the case in question has been classified as CFIT, but if the investigation finds that it was a LOC-I situation, the event type will be specified.

Drone operations involved the largest share of LOC-I cases reported last year, nine cases. However, this number was clearly below the average and amounted to approximately one third of the figures for the previous year. A large number of cases involved losing control of a DJI Matrice 300 RTK device for a variety of reasons. There is a degree of uncertainty in statistics on drone operations, because the number of operators is large and it is likely that the level of awareness of the reporting criteria varies. Specifications to the reporting criteria are also expected from the European Union Aviation Safety Agency EASA during 2024.

9.1 Event types contributing to losses of control

In addition to the cases described below involving laser interference, bird strikes or fire and smoke, other types of situations to be monitored that may contribute to the loss of control in flight include being under or over the aircraft's speed limit, incidents due to a wake vortex, deficiencies in deicing and anti-icing, faults in the flight control systems and different kinds of loading errors, such as the

placement of the load contrary to the loading instructions or errors in the attachment of the load or weight calculations.

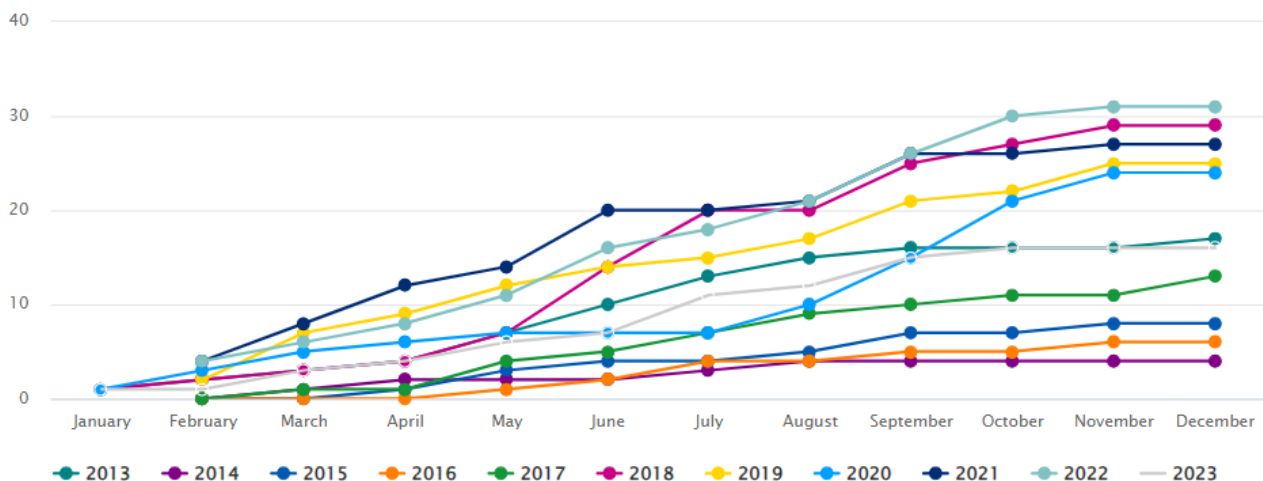
Of the types of cases mentioned above, ones reported numbering above the average in 2023 included **low speed and high speed cases**. In many cases an aircraft carrying out commercial air transport was involved, but the events did not have any serious consequences. A very typical case involved speed momentarily exceeding the limit values specified due to weather conditions such as turbulence or a gust of wind. A large share of the cases occurred during the approach, when the speed of the aircraft, for example, momentarily exceeded the speed limits for the use of flaps. Several situations in which the limits were exceeded momentarily in a strong tailwind were also reported during the cruise phase of the flight.

A slightly above-average number of **cases related to loading the aircraft** were also reported. In such situations, for example, the actual loading of the aircraft was carried out in a way different from what was required in the loading instructions, the load was tied incorrectly or insufficiently, or the actual weight of the load and the weight recorded in the weight calculations differed from each other. However, the cases did not have any serious consequences. Deficiencies such as poorly secured load are often observed only at the destination (typically at Helsinki Airport) when the aircraft is being unloaded. In other words, the actual mistake may have been made at the departure airport, usually abroad.

As a positive observation in 2023 it can be noted that the number of **deficiencies in deicing and anti-icing** reported was clearly lower than in the previous year, and the figure was now at the same level as the average. Ice accumulating on the surfaces of the aircraft may have a significant impact on its flying characteristics, and in the worst case, it may lead to loss of control of the aircraft. In the autumn of 2023, Traficom published updates to the winter operations bulletins, in which icing and its prevention have also been described very comprehensively. **Bulletin (PDF)** targeted at airlines and **bulletin** for general and recreational aviators.

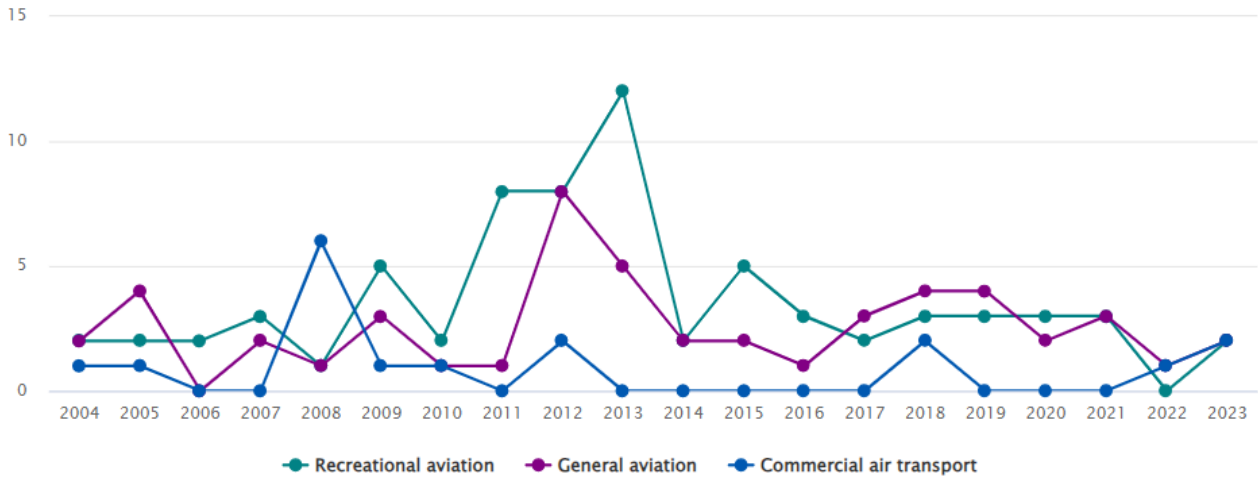
LOC-I events

Includes all aviation domains, such as drones



Loss of control in air per aviation domain

Does not include drones, state aviation or foreign aircraft



9.2 Laser interference

In 2023, there were 76 cases of laser interference reported, of which 35 occurred in Finland and 41 abroad. The overall number was clearly above the average for 2013-2022 (44.3).

The number of interference cases that occurred abroad was double compared to the average. In Finland, too, the number of interference cases was also above the average of 27.7.

The number of interference cases started to increase in 2021, and the growth also continued last year.

Approximately 70% of the interference cases in Finland occurred at Helsinki Airport, which has also been the most common area before. The other interference cases were evenly distributed among the rest of the airports, with Turku and Jyväskylä being the next most common.

Autumn has typically been the most active period with regard to interference, and this also remained true last year. Most of the interference cases occurred from September to October, when a laser was pointed at an approaching commercial air transport aircraft. There were no serious consequences to any of the cases in Finland. In principle, a report of an offence to police is always filed concerning the cases, usually by the airline. Traficom also files requests for investigation with the police.

The number of interference cases abroad increased significantly, doubling compared to both the previous year as well as the average.

Most of the cases occurred near London. London was highlighted as the area with most cases in the previous year, too, but now the numbers clearly increased. In addition to laser interference, plenty of interference involving drones was also observed in the London area. Other cases were fairly evenly distributed over the whole of Europe.

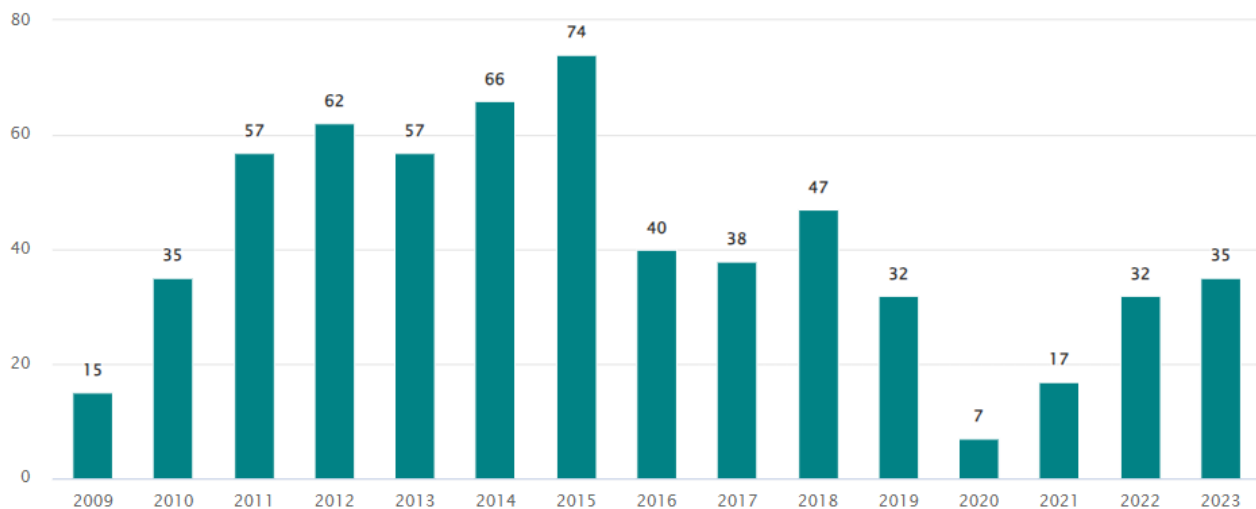
Laser interference is a crime. Pointing a laser beam at the crew of an aircraft is punishable in itself, even if it did not cause any actual damage or real danger to the aircraft, its crew or the passengers.

The first sentence for laser interference was handed down in 2018, when the District Court of Lapland sentenced a man who had pointed a powerful laser beam at a medical helicopter to a fine. In its judgment, the Court found the man guilty of causing a serious traffic hazard and that his interference had caused a danger to aviation safety. Currently in progress is a pre-trial investigation by the police into a case of interference with a general aviation aircraft in Hyvinkää in September 2022.

In March 2021, FinnHEMS, the Finnish Defence Forces, the Finnish Border Guard, the Finnish Pilots' Association (FPA), the Radiation and Nuclear Safety Authority (STUK) and Traficom started the **campaign "Laser ei ole lelu" ("A laser is not a toy", in Finnish)**, which brings attention to the serious consequences of laser interference to air traffic.

In September 2019, Traficom published a **safety bulletin on laser interference (in Finnish)** reminding of the dangers of laser interference and instructing pilots on how to act in the case of laser interference. The bulletin also described the first criminal conviction for laser interference.

Laser interferences in Finland



Pointing with a laser is punishable by law

Handheld laser pointers are cheap and easily available, which means that many people see them as toys. In Finland, the maximum permitted output of an individual laser pointer is one milliwatt. Audiovisual equipment may have a laser pointer with five milliwatts of power at maximum. If such a pointer has a green beam, it may interfere with pilots at a distance of up to three kilometres. If the laser has 125 mW of power, the interference may reach up to 18 kilometres. Eyes are clearly more sensitive to green light than red or blue light.

Pointing the beam of a laser pointer at the flight crew of an aircraft is punishable in itself, even if it did not cause any actual damage or real danger to the aircraft, its crew or the passengers.

If e.g. the beam actually hits the eyes of the flight crew during a critical stage of the flight, i.e. takeoff or landing so that the pilot is blinded or even loses their eyesight partially, the dangerous situation is real and serious. This may constitute an offence called "causing danger" or, in certain situations, "criminal traffic mischief" or "negligent endangerment."

If the use of a laser pointer causes real damage, the situation will naturally be assessed in a completely different manner. In that case, all the provisions of the Criminal Code that safeguard the life and health of people apply, such as the provisions on negligent bodily injury and homicide. Naturally, the party causing the damage would also be liable for the considerable financial damage.

More information on the legislation regarding interference is available at tieto.traficom.fi.

9.3 Bird strikes

In 2023, there were 348 reported cases of bird strikes in Finland or involving Finnish aircraft abroad. The total number was above the average for 2013-2022 (278.3). There were 211 bird strikes in Finland (average: 174) and 137 abroad (average: 107.1).

The number of bird strikes in Finland was now at the same level as in the years before the coronavirus pandemic. Approximately half of the bird strikes occurred at Helsinki Airport. Nevertheless, in relation to the number of operations at airports, Helsinki was at the same level as the other airports. Based on relative figures, the most bird strikes occurred in Kemi and Kokkola. All in all, the number of cases in relation to the number of operations at airports was above the average last year.

Usually bird strikes do not cause any significant dangerous situations, but one bird strike that occurred at Helsinki Airport last year was classified as a serious incident. In the case in question, several birds collided with an airliner and its engines during takeoff. The pilots reduced the power to one of the engines and landed successfully back at the airport.

Serious incidents caused by bird strikes have been rare; the last classified as such occurred in 2013, when a hawk flew through the windscreen of a small aircraft and into the cockpit.

The numbers abroad are also more or less at the same level as before the coronavirus pandemic. Most of the cases occurred in Italy (Rome), Greece (Rhodes) and Germany (Berlin). Typically, these areas (as well as Spain) have seen a large share of bird strikes.

Based on statistics on 2013-2022, most bird strikes in Finland occurred in the morning from 7 to 8 o'clock in July-August. In a bit over half of the cases, a bird strike occurred in connection with approach or landing. It was usually a small-sized bird that hit the aircraft. The exact species was rarely reported, but a clear

majority of reports involve various swallows and martins, followed by different gulls.

The statistics in 2023 seemed to follow the same pattern, except that the typical time of day of the bird strike occurring was from 11 to 12 o'clock.

You can browse bird strike occurrences in more detail in the interactive, updating report at tieto.traficom.fi.

9.4 Fire and smoke events on aircraft

One of the indicators pertaining to aircraft loss of control that is monitored by Traficom is fires or smoke detection on aircraft. A fire on an aircraft is a situation which may quickly lead to the loss of control and destruction of the aircraft.

There were 10 smoke detections reported in 2023, which is exactly the average for 2013-2022. In most cases, there was merely smoke detection in the cockpit or cabin, but no actual fire. To ensure safety, many such cases led to the flight diverting to the closest suitable aerodrome. In one of the cases during the second quarter, the smoke formation was so strong that the passengers were evacuated from the aircraft.

Several cases in which a passenger smoked in the toilet of the aircraft were reported last year. These cases also include the use of electronic cigarettes. There were no serious consequences from the cases, but due to the risk of fire, both regular smoking and the use of electronic cigarettes are prohibited. Last year, one case of smoking led to a fire in the toilet of the aircraft. Fortunately, the fire could be extinguished quickly.

In October, Traficom published a [bulletin](#) concerning unruly passengers. Smoking on the aircraft is also one of the types of such behaviour.

Tieto.traficom also has [an overview of cases related to disruptive passengers](#).

10 Controlled flight into terrain and near miss situations (CFIT/near-CFIT)

In 2023, there were eight reported CFIT or near-CFIT type situations, meaning situations in which an aircraft, under pilot control, is flown into the ground or an obstacle or there was a CFIT-type near-miss situation. The number was more or less at the level of the average for 2013-2022 (8.7). Three of the cases occurred in manned aviation and the rest in drone operations.

The number of cases in manned aviation was approximately half of the average of 2013-2022.

However, CFIT cases often have serious consequences; this was also true last year, when two of the cases of the year were classified as accidents and one as a serious incident. One of the accidents led to a fatality, when a general aviation aircraft carrying out an aerobatic show in Selänpää crashed down, killing the pilot. So far, it has been estimated that it was a CFIT case. The cause will be updated after the **investigation** into the case is complete, if it is discovered that it involved a LOC-I, for instance.

In the other CFIT accident, a combination of a towing aircraft and a glider encountered a downburst and heavy downpour that occurred rapidly in the area in Nummela at a low altitude after takeoff. The towing combination was unable to maintain the altitude, and the towing aircraft had to disconnect the glider being towed. The glider carried out an emergency landing in to a forest soon after being disconnected. The glider was seriously damaged and the flight instructor and student pilot in the aircraft were injured.

In the serious incident, a helicopter had to take evasive action in order to prevent hitting a mast. The mast had the required aircraft warning lights, but they may have been covered with frost to the extent that their visibility was less than optimal. The currently used LED lights generate less heat than the previously used types of light.

The number of CFIT cases in drone operations remained at the level of the average for recent years. Typically, they involved a drone colliding with an obstacle, such as a tree or building, leading to the drone being damaged. No people were injured in these cases.

10.1 Event types contributing to CFIT situations

Situations to be monitored that may contribute to CFIT situations include a wrong altimeter pressure setting, insufficient information on obstacles and errors and deficiencies in aeronautical charts. Furthermore, reports of warnings from the aircraft ground proximity warning system (GPWS) are monitored.

Of these types of cases, the numbers of **reports about lack of information on obstacles and deficiencies in map data** were above the average of the previous years.

The number of **reports about lack of information on obstacles** was significantly higher than the average of the previous years.

During the year, topics included reports of e.g. unauthorised cranes in the vicinity of airports as well as reports of deficiencies in aircraft warning lights e.g. on

masts and in wind power plants. A serious incident that occurred in helicopter operations was also related to the visibility of aircraft warning lights. **Traficom’s website** provides more information on flight obstacles and applying for related permits.

On 1 October 2023, the responsibility for maintaining the registers of flight obstacles and requests for statements regarding flight obstacles was transferred to Traficom. Several reports were submitted at the end of the year related to the adoption of this new process; in fact, this raised the total number above the average.

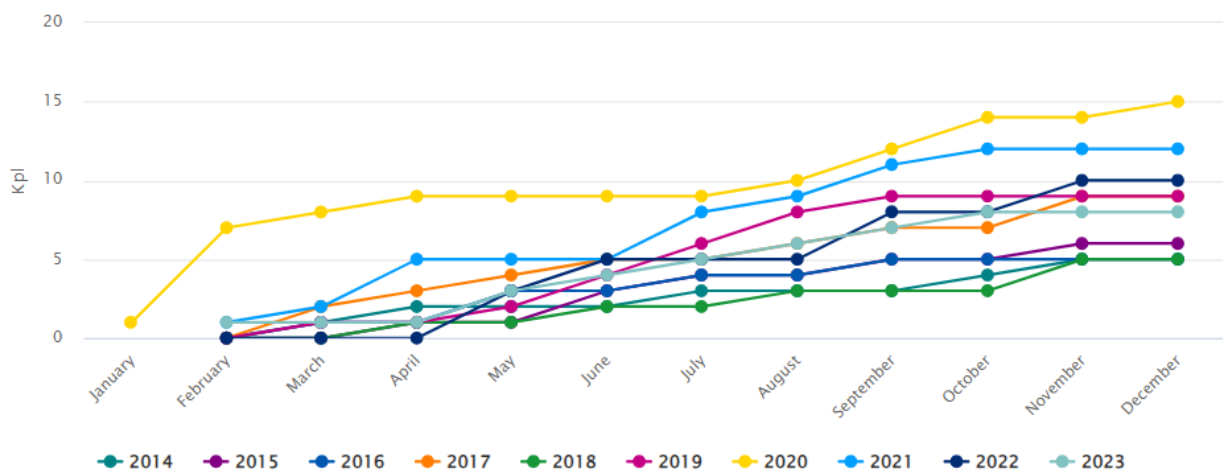
Slightly more reports than average were received on **deficiencies in map data** in either published aeronautical charts or the map databases of aircraft. In a typical case, it was noted that information was missing from an approach chart or there was a mistake in a map in the map database of the aircraft. The cases had no serious consequences.

Reports on **wrong altimeter pressure settings** were at the level of the average. This means that no significant changes were found in the numbers in Finland, but the issue has been identified as a rising risk factor on the European level. On 9 March 2023, EASA published a **bulletin** on the topic; it explained the risks of a wrong altimeter pressure setting and gave recommendations to reduce the risk.

A wrong pressure setting can result in being above or below the clearance altitude, which in turn is a contributing factor to mid-air near misses. During an approach, a wrong pressure setting may lead to the approach being carried out either at a too high or too low altitude. A too low approach may lead to a CFIT situation.

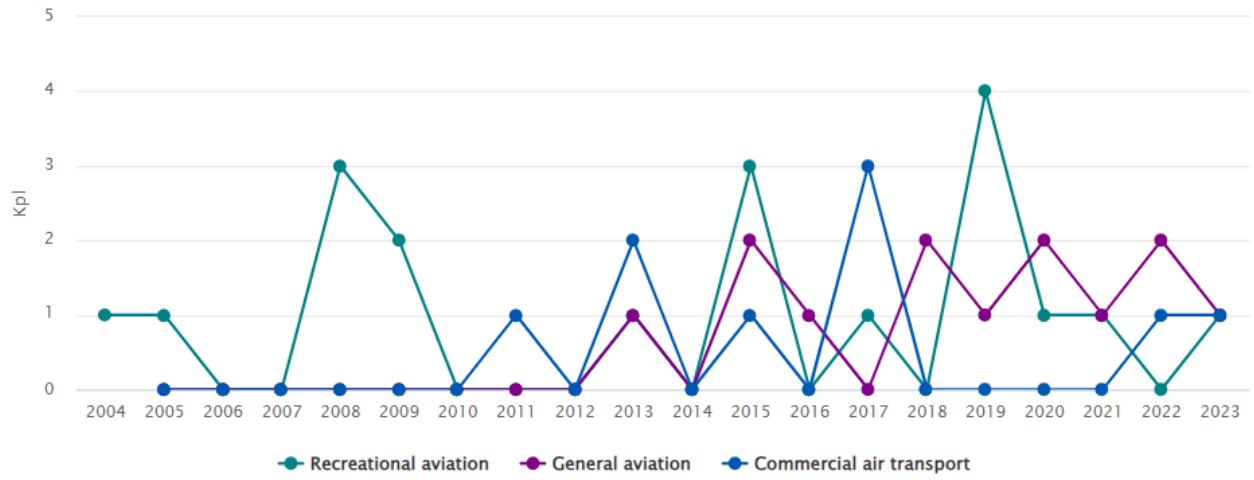
CFIT/Near CFIT-incidents

All aviation domains, such as drones



CFIT/near-CFIT per aviation domain

Does not include drones, state aviation or foreign aircraft



11 Collisions while taxiing to or from runway (GCOL)

In 2023, two GCOL cases were reported, meaning situations where a collision occurred while an aircraft was taxiing or air-taxiing. The number was slightly below the average for 2013-2022 (2.9) and clearly lower than in a few previous years.

One situation that occurred in helicopter operations during the first part of the year was classified as a serious incident, when a helicopter started to slide forward on an icy road in connection with takeoff and its blades hit tree branches.

11.1 Event types contributing to GCOL situations

Situations to be monitored that may contribute to GCOL situations include aircraft pushback or taxiing interference, insufficient apron supervision, damage incurred during ground handling, foreign object debris (FOD) at the manoeuvring area and apron. Also reports on the poor condition of the apron and taxiways are monitored.

Out of the types of cases mentioned above, reports related to insufficient apron supervision and reports on the condition of the apron and taxiways were above the average in 2023.

Insufficient apron supervision involves e.g. cases where passengers were able to move outside the determined areas or without necessary supervision. Here the risks include injuries to passengers, although we have luckily been able to avoid such situations.

The number of such cases was clearly higher than average in 2023. 80% of them occurred at Helsinki Airport. In October in particular, a large number of cases related to insufficient supervision were reported at Helsinki Airport. The numbers decreased to the normal level in November-December.

The increased number of reports in October was related to the serious incident which occurred in August.

In the serious incident, a child passenger nearly hit the rotating propeller of an aircraft. The child passenger was walking towards an aircraft parked at an apron stand, but started running after a fallen hat and nearly collided with the rotating propeller of another plane that was just arriving to the adjacent stand. A ground handling company employee noticed the dangerous situation and managed to prevent any more severe consequences.

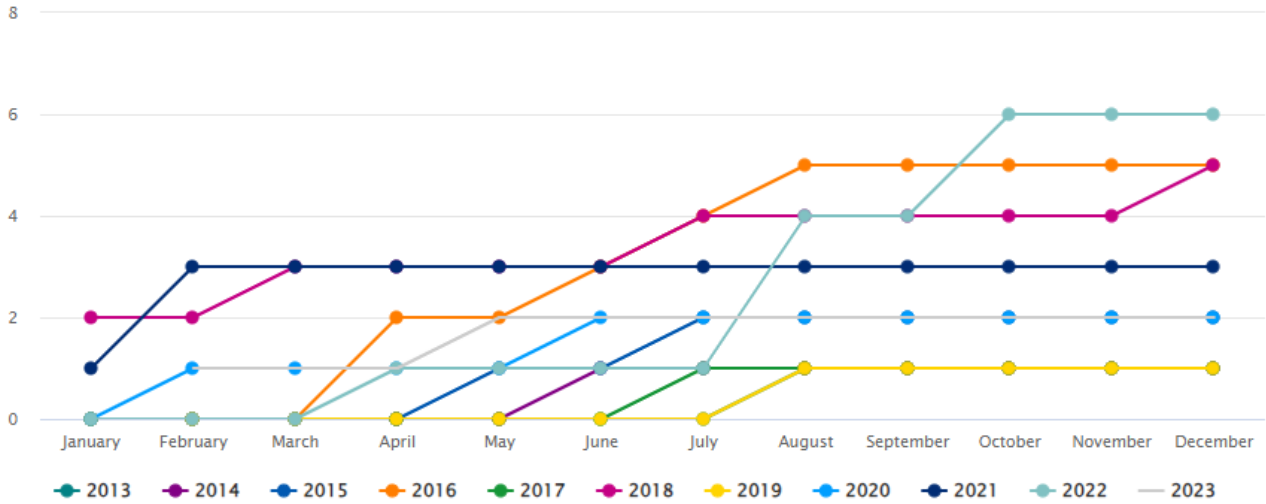
After the incident, the methods of supervising the aprons were changed to prevent similar situations. The implementation of these new procedures triggered an increase in the number of reports related to apron supervision.

The number of reports on the condition of the apron and taxiways was clearly above the average during the year. However, they clearly decreased compared to the numbers of the previous year.

The reports most commonly involved slipperiness of the apron and taxiways of the airport, and therefore the numbers outside the winter season remained low. Most of the cases were reported in January-February and November-December. The largest share of the cases was reported from Helsinki Airport.

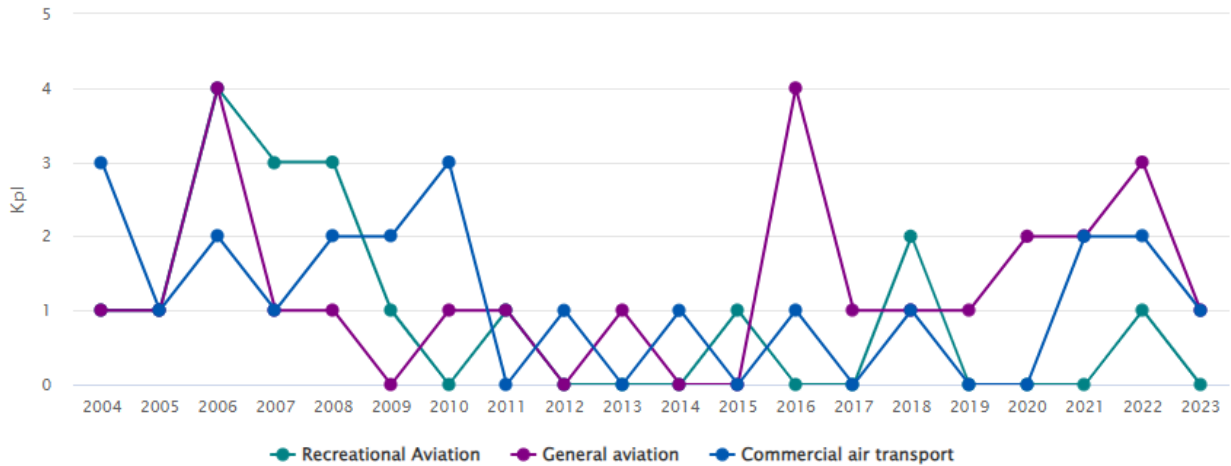
Slippery apron areas naturally hinder the movement of aircraft and increase the risk of collision. Slippery paths for passengers may also increase the risk of slipping. Already at the start of 2022, Traficom made note of the large number of reports on slippery conditions and requested Helsinki Airport to clarify the factors leading to the reports and planned corrective measures.

Ground collisions



Ground collisions (GCOL) per aviation domain

Does not include state aviation or foreign aircraft



12 Aviation safety situation monitoring

ON MONITORING THE AVIATION SAFETY SITUATION

In addition to the top level indicators (tier 1: accidents, serious incidents and fatalities), the safety situation is monitored with different lower level (tiers 2 and 3) indicators used to follow the development of operative risk factors.

Tier 2 indicators include the most significant causes of accidents (e.g. runway incursions, mid-air near misses and loss of control of the aircraft in flight), and tier 3 measures the causes or contributing factors of these cases or other cases that involve a threat of an accident or incident.

The indicators used to monitor the aviation safety situation and the targets set for them are based on the indicators and targets specified in the Finnish Aviation Safety Programme (FASP). A more detailed description of them can be found in **Annex 2 to the Finnish Aviation Safety Programme**.

The safety situation is monitored especially with regard to commercial air transport, general and recreational aviation as well as air navigation services and aerodromes. This publication does not discuss hang gliding and paragliding or skydiving.

You can find the definitions of the abbreviations and concepts used in the situation review [here](#) (in Finnish).

Aviation safety situation monitoring - operative tier 1 (top level) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation
Commercial air transport: SPI 1.1: Number of accidents SPI 1.2.: Number of fatal accidents SPI 1.3.: Number of fatalities in accidents SPI 1.4: Number of serious incidents	Commercial air transport: SPI 1.1: no accidents SPI 1.2: no fatal accidents SPI 1.3: no fatalities SPI 1.4: downward trend in the rate of serious incidents in proportion to traffic volume (five-year average)	GREEN	SPI 1.1. Q1-Q4/2023: No accidents occurred in Finnish commercial air transport. The target (no accidents in commercial air transport) has been reached in this respect. SPI 1.2 & SPI 1.3 Q1-Q4/2023: No fatal accidents, and therefore the targets (no fatal accidents and no fatalities in aviation accidents) were reached.

Aviation safety situation monitoring - operative tier 1 (top level) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation
			<p>SPI 1.4 Q1-Q4/2023: Seven serious incidents, slightly above the average.</p> <p>The flight hour statistics for 2023 are being collected, which means that the situation made proportional to the traffic volume will be ready during the spring of 2023. Based on a preliminary assessment, the target (decreasing number of serious incidents in relation to the traffic volume, five-year average) will not be reached. The target was reached in 2022. The situation review remains green. The development trend remains negative due to e.g. the risks caused by drone operations and the conflict in Ukraine.</p>
<p>General and recreational aviation: SPI 1.1: Number of accidents SPI 1.2.: Number of fatal accidents SPI 1.3.: Number of fatalities in accidents</p>	<p>General and recreational aviation: General and recreational aviation: SPI 1.1: ≤ 10 accidents / 100,000 flight hours (five-year average)</p>	YELLOW	<p>SPI 1.1 Q1-Q4/2023: Five accidents occurred in general and recreational aviation in Finland. Below the number in previous years. The flight hour statistics for</p>

Aviation safety situation monitoring - operative tier 1 (top level) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation
SPI 1.4: Number of serious incidents	<p>SPI 1.2: ≤ 0.6 fatal accidents / 100,000 hours flown (five-year average)</p> <p>SPI 1.3: a maximum of two fatalities / 100,000 hours flown (five-year average)</p> <p>SPI 1.4: downward trend in the rate of serious incidents in proportion to traffic volume (five-year average)</p>		<p>2023 are being collected, which means that the situation in 2023 will be ready during the spring of 2024. Based on a preliminary assessment, the target (fewer than 10 accidents/100,000 flight hours, five-year average) will be reached. The target was not reached in 2022.</p> <p>SPI 1.2 Q1-Q4/2023: One fatal accident. The number is below the average of the previous years. The flight hour statistics for 2023 are being collected, which means that the situation in 2023 will be ready during the spring of 2024. Based on a preliminary assessment, the target (fewer than 0.6 fatal accidents/100,000 flight hours, five-year average) will not be reached. The target was not reached in 2022, either.</p> <p>SPI 1.3 Q1-Q4/2023: One</p>

Aviation safety situation monitoring - operative tier 1 (top level) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation
			<p>fatal accident, in which one person died. Below the long-term average.</p> <p>The flight hour statistics for 2023 are being collected, which means that the situation in 2023 will be ready during the spring of 2024. Based on a preliminary assessment, the target (a maximum of two fatalities/100,000 flight hours, five-year average) will be reached.</p> <p>The target was also reached in 2022.</p> <p>SPI 1.4 Q1-Q4/2023: There were 13 serious incidents, which is fewer than in previous years. The flight hour statistics for 2023 are being collected, which means that the situation in 2023 will be ready during the spring of 2024. Based on a preliminary assessment, the target (decreasing number of incidents in relation to the traffic volume, five-year average) will be reached.</p> <p>The target was</p>

Aviation safety situation monitoring - operative tier 1 (top level) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation
			<p>not reached in 2022. The situation review remains yellow. The development trend remains positive. Despite the fatal accident, a good development trend is visible in the situation in general and recreational aviation with regard to safety.</p>

Aviation safety situation monitoring - operative tier 2 (main causes of accidents) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation.
SPI 2.1: The number of runway excursions (RE)	Commercial air transport: SPI 2.1: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: no runway excursions in Finnish commercial air transport. The situation review remains green. The development trend remains neutral.
SPI 2.1: The number of runway excursions (RE)	General and recreational aviation: SPI 2.1: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1/-Q4/2023: six runway excursions in general and recreational aviation. The number is below the long-term average. The situation review remains green. The development trend remains neutral.
SPI 2.2: The number of runway incursions (RI-VAP)	Commercial air transport: SPI 2.2: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: Four runway incursions (one in Finland, three abroad) in Finnish commercial air transport, the number is below the long-term average. The situation review remains green. The development trend remains neutral.
SPI 2.2: The number of runway incursions (RI-VAP)	General and recreational aviation: SPI 2.2: no target in a number format.	YELLOW	Q1-Q4/2023: 20 runway incursions in general and recreational aviation, the number is lower

Aviation safety situation monitoring - operative tier 2 (main causes of accidents) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation.
	The situation review is based on the development of the absolute and proportioned number of cases.		than in the previous years. The situation review remains yellow. The development trend remains positive.
SPI 2.2: The number of runway incursions (RI-VAP)	Ground vehicles and individuals: SPI 2.2: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	YELLOW	Q1-Q4/2023: 25 runway incursions caused by vehicles The number of runway incursions caused by vehicles at airports is slightly higher than in the previous years. In relation to the number of operations at airports, the number of cases was above the long-term average. Individuals caused three runway incursions. The situation review remains yellow. The development trend remains neutral.
SPI 2.3: The number of collisions and near misses (MAC/AIRPROX)	Commercial air transport: SPI 2.3: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	YELLOW	Q1-Q4/2023: Finnish commercial air transport was a party to 45 near misses. The number was still clearly above the average. In many of the cases, the other party was a foreign drone. The situation review remains

Aviation safety situation monitoring - operative tier 2 (main causes of accidents) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation.
			yellow. The development trend remains negative. The conflict in Ukraine is considered to increase the risk of collisions and near misses.
SPI 2.3: The number of collisions and near misses (MAC/AIRPROX)	General and recreational aviation: SPI 2.3: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: general and recreational aviation was involved in 16 cases (13 in Finland, three abroad). The number is slightly below average. The situation review remains green. The development trend remains neutral. The development trend of situations that occurred abroad increases uncertainty.
SPI 2.3: The number of collisions and near misses (MAC/AIRPROX)	Air navigation services: SPI 2.3: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	YELLOW	Q1-Q4/2023: The number of separation minima infringements with ATC contribution is 12. The number was slightly below the average for 2013-2022. In relation to the number of operations, it is slightly below the average. The situation review remains yellow. The

Aviation safety situation monitoring - operative tier 2 (main causes of accidents) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation.
			development trend remains positive.
SPI 2.4: The number of cases of controlled flight into terrain (CFIT) and similar incidents	Commercial air transport: SPI 2.4: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: one near CFIT situation occurred in Finnish commercial air transport. The situation review remains green. The development trend remains neutral.
SPI 2.4: The number of cases of controlled flight into terrain (CFIT) and similar incidents	General and recreational aviation: SPI 2.4: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: two CFIT/near CFIT situations occurred in general and recreational aviation. The number is slightly below the long-term average. The situation review remains green. The development trend remains neutral.
SPI 2.5: Number of cases of loss of control of the aircraft in flight (LOC-I)	Commercial air transport: SPI 2.5: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: two temporary LOC-I situations occurred in Finnish commercial air transport. The situation review remains green. The development trend remains neutral.
SPI 2.5: Number of cases of loss of control of the aircraft in flight (LOC-I)	General and recreational aviation: SPI 2.5: no target in a number format. The situation	GREEN	Q1-Q4/2023: three LOC-I situations occurred in general and recreational aviation. The number is clearly below

Aviation safety situation monitoring - operative tier 2 (main causes of accidents) indicators			
Indicator	Target	Situation assessment	Situation assessment based on the history and current situation.
	review is based on the development of the absolute and proportioned number of cases.		the average of the previous years. The situation review remains green. The development trend remains neutral.
SPI 2.6: The number of cases involving collisions while taxiing to or from a runway (GCOL)	Commercial air transport: SPI 2.6: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: one GCOL case occurred in commercial air transport. The situation review remains green. The development trend is changed from neutral to negative.
SPI 2.6: The number of cases involving collisions while taxiing to or from a runway (GCOL)	General and recreational aviation: SPI 2.6: no target in a number format. The situation review is based on the development of the absolute and proportioned number of cases.	GREEN	Q1-Q4/2023: one GCOL situation occurred in general and recreational aviation. The number is below the long-term average. The situation review remains green. The development trend remains negative.

13 Glossaries and definitions

ACAS (Airborne Collision Avoidance System) refers to a system that warns about the risk of airborne collisions and meets the requirements of the Convention on International Civil Aviation, Annex 10, Vol. IV, Chapter 4 concerning the ACAS II system (seventh edition). The system is based on an exchange of information between the transponders of aircraft, based on which warnings and alerts about other aircraft flying close by are issued to pilots, if necessary. A system that meets the ACAS II requirements is called TCAS (Traffic Collision Avoidance System). The system issues either warnings (TA – Traffic Advisory) or instructions on what to do (RA – Resolution Advisory).

Controlled flight into or towards terrain (CFIT/near CFIT) refers to a situation in which an airworthy aircraft under the control of the pilot is inadvertently flown (or nearly flown) into terrain, water or an obstacle.

EASA refers to the European Aviation Safety Agency responsible for ensuring safety and environmental protection in European air transport.

Recreational aviation refers to flying with gliders, motor gliders, ultralight aircraft, autogyros and hot air balloons, hang gliding, paragliding and skydiving. Note! If passengers are flown on a hot air balloon for a fee, this constitutes commercial air transport.

Note 2! This publication does not discuss hang gliding and paragliding or skydiving.

Loss of control in flight (LOC-I) refers to a situation where the pilot loses control of an airborne aircraft, resulting in a significant deviation from the aircraft's intended flight path. The loss of control may be total or momentary. It may be caused by human error, mechanical faults or external factors, for example.

Aviation Safety Performance Indicators (SPI) All safety performance indicators used in aviation (tier 1, tier 2 and tier 3) with their abbreviations and definitions can be found in [Annex 2 to the Finnish Aviation Safety Programme](#).

ICAO refers to the International Civil Aviation Organisation that operates under the UN.

Airspace infringement (AI) refers to a situation in which an aircraft flies into a controlled or restricted airspace (prohibited (P) or restricted (R) area) or into an Air Defence Identification Zone (ADIZ) without the required permit or clearance. Flying in the airspace of an AFIS body without the required radio connection is also classified as airspace infringement.

Commercial air transport refers to the use of an aircraft to transport passengers, freight or mail against payment or other compensation.

Runway excursion (RE) is an uncontrolled exit by an aircraft from a runway during takeoff or landing. This may be unintentional or intentional, for instance as the result of an evasive manoeuvre.

Runway incursion (RI-VAP) refers to any situation where an aircraft, vehicle or person is present on the runway or its protected area, without clearance or otherwise incorrectly. This includes low approaches executed without clearance or otherwise incorrectly.

Ground handling refers to the ground handling services offered at the aerodrome for its users, including passenger handling, baggage handling, cargo and mail handling, ramp handling, aircraft cleaning and other services, fuel and oil handling, technical aircraft maintenance, assisting with flight operations and helping the crew, field transport, catering services as well as ground handling administration and monitoring (source: Annex to the Ground Handling Directive 96/67/EC).

Unmanned aviation (RPAS, drone operations) refers to operations with unmanned aircraft or drones in this publication.

Accident means 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 time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) 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; or

b) the aircraft sustains damage or structural failure 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 is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tyres, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes) or minor damage to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike, (including holes in the radome);

or

c) the aircraft is missing or is completely inaccessible

Serious injury means an injury which is sustained by a person in an accident and which involves one of the following:

- a) hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received;
- b) a fracture of any bone (except simple fractures of fingers, toes or nose);
- c) lacerations which cause severe haemorrhage, nerve, muscle or tendon damage;
- d) injury to any internal organ;
- e) second or third degree burns, or any burns affecting more than five per cent of the body surface;
- f) verified exposure to infectious substances or harmful radiation.

Foreign commercial air transport refers to the transport of passengers, cargo or mail for a fee or other compensation with an aircraft that is not Finnish or under an air operator certificate that has been granted in a place other than Finland.

Serious incident means an incident involving circumstances indicating that there was a high probability of an accident and is 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 time it comes to rest at the end of the flight and the primary propulsion system is shut down. A list of examples of serious incidents has been published in an Annex to the **EU Regulation 996/2010**.

State aviation refers to aviation in military, Customs or police operations, search and rescue services, firefighting, border control or a comparable activity or service carried out by an operator that has received the authority of a public authority or that is carried out on behalf of such a party in the name of public interest under the supervision and responsibility of an authority.

Mid-air collision (MAC) or near miss (near miss/AIRPROX) refers to a situation in which aircraft collide with each other mid-air or in which the distance or relative distances and speeds of airborne aircraft have been such that the safety of the aircraft may have been endangered.

Collision while taxiing to or from a runway (ground collision, GCOL) refers to a situation where an aircraft comes into contact with another aircraft, a vehicle, a person, an animal, a structure, a building or any other obstacle while moving under its own power in any part of the airport other than the active runway, excluding power pushback.

General aviation refers to all other manned aviation apart from commercial air transport and aerial work.

Note! In this publication, general aviation and aerial work are discussed as one single category. In addition, recreational aviation is handled as its own category.

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