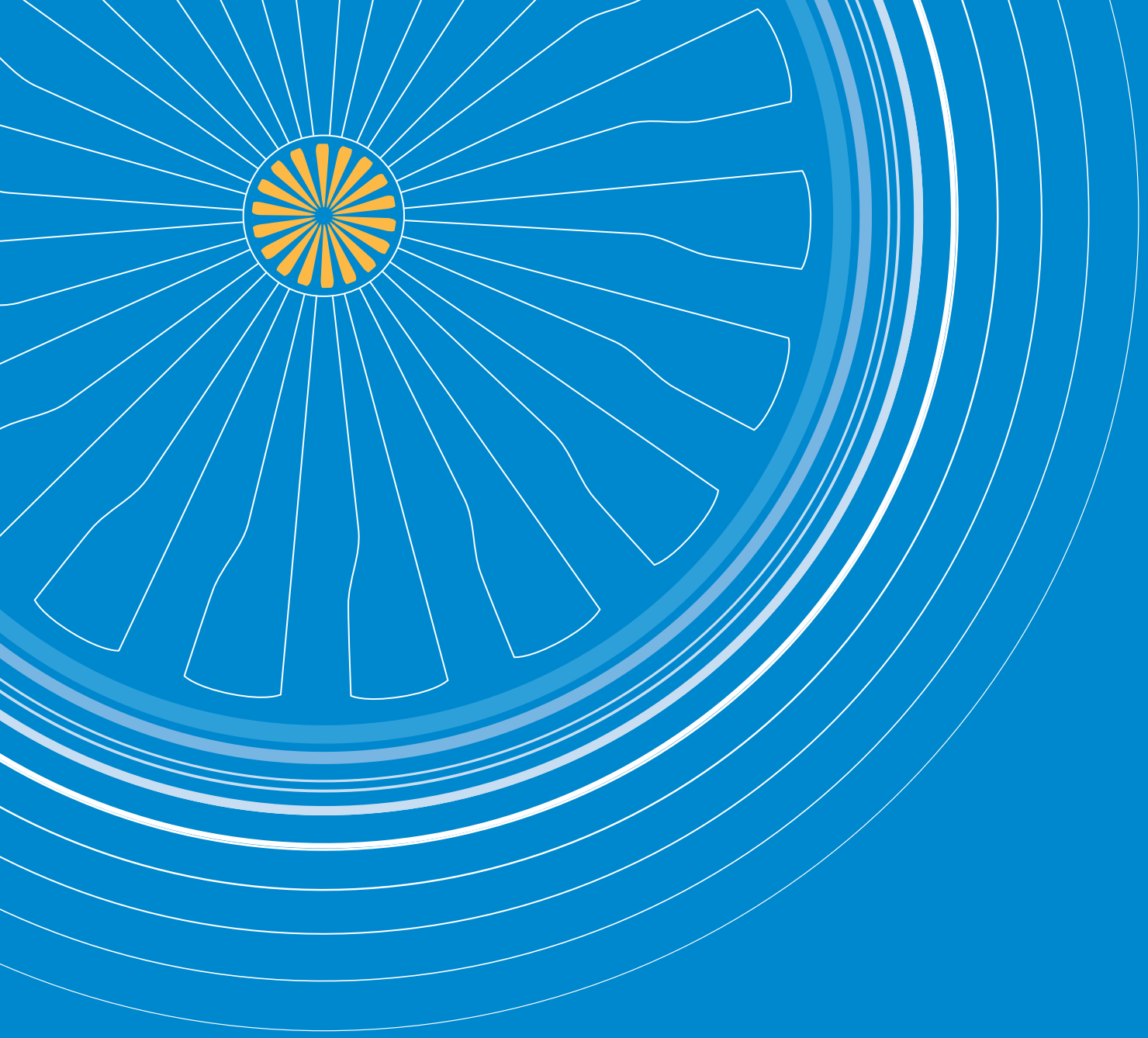


EASA

Annual Safety Review

2012

EUROPEAN AVIATION SAFETY AGENCY
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

Overview of Key Facts 2012

Overview of the Number of Commercial Air Transport Accidents, Fatal Accidents and Fatalities for EASA MS Operated Aircraft Above 2,250 kg MTOM

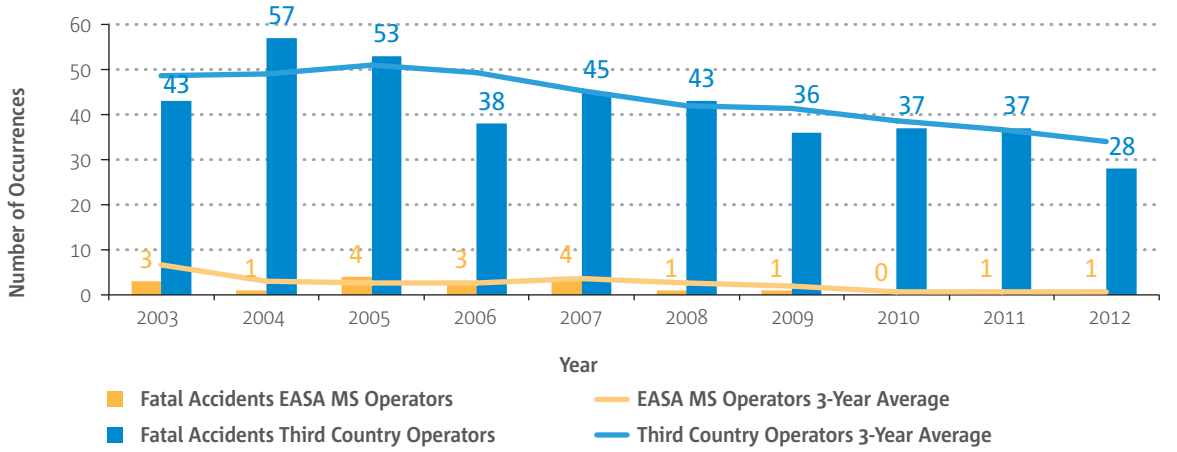
Aeroplanes

Period	Number of Accidents	Fatal Accidents	Fatalities on Board	Ground Fatalities
2001-2010 (Average per Year)	25.2	3.4	77.8	0.8
2011 (Total)	30	1	6	0
2012 (Total)	34	1	0	1

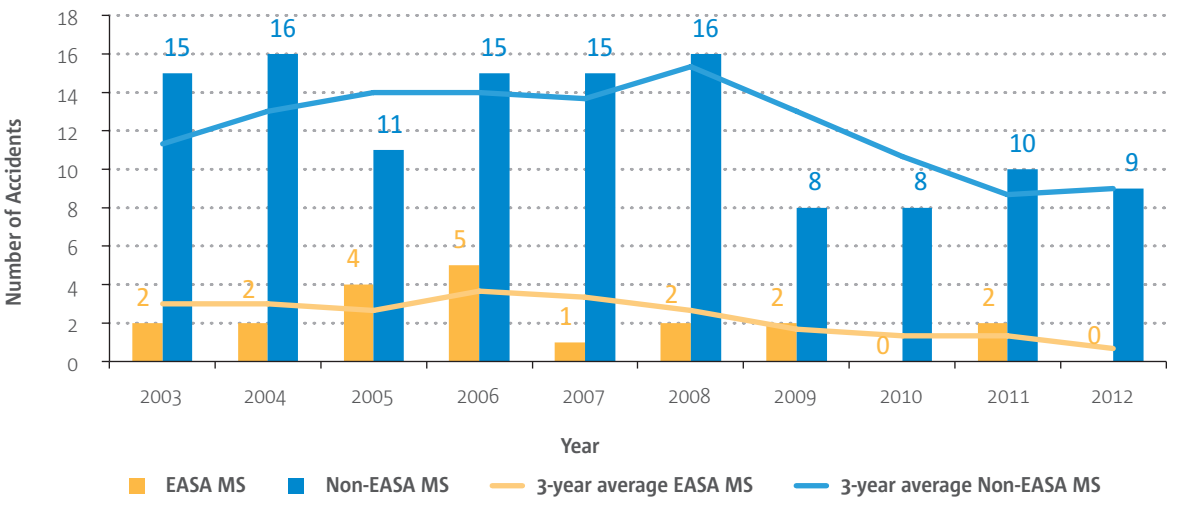
Helicopters

Period	Number of Accidents	Fatal Accidents	Fatalities on Board	Ground Fatalities
2001-2010 (average)	13.2	3.3	17.6	0.1
2011	9	3	19	0
2012	11	2	8	0

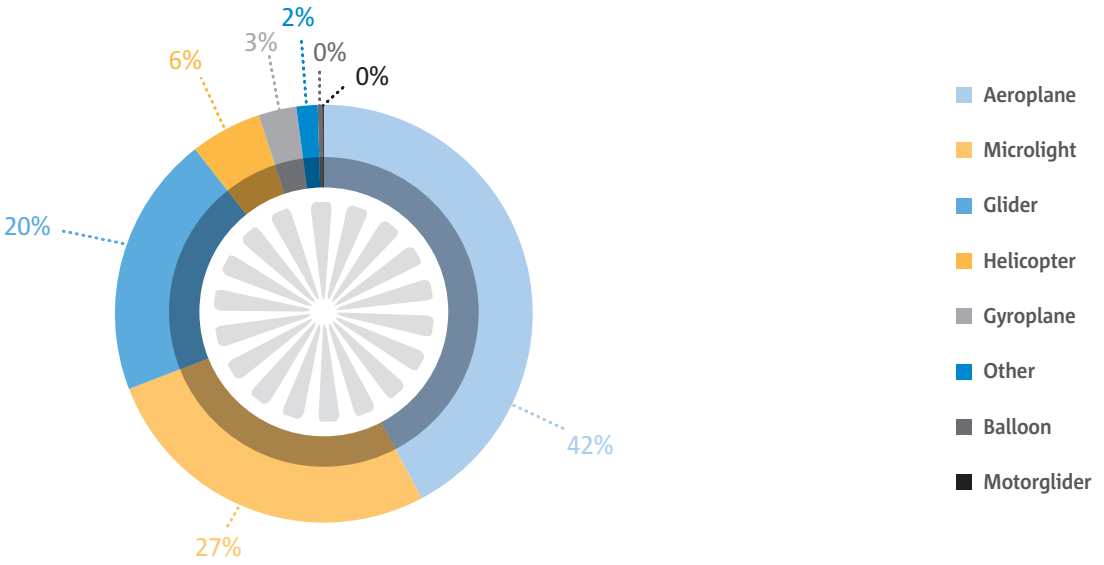
Number of Fatal Accidents Involving EASA MS and Third Country Operated CAT Aeroplanes, MTOM Above 2,250 kg, 2003-2012



Number of Fatal Accidents involving EASA MS and Third Country Operated CAT Helicopters, MTOM Above 2,250 Kg, 2003-2012

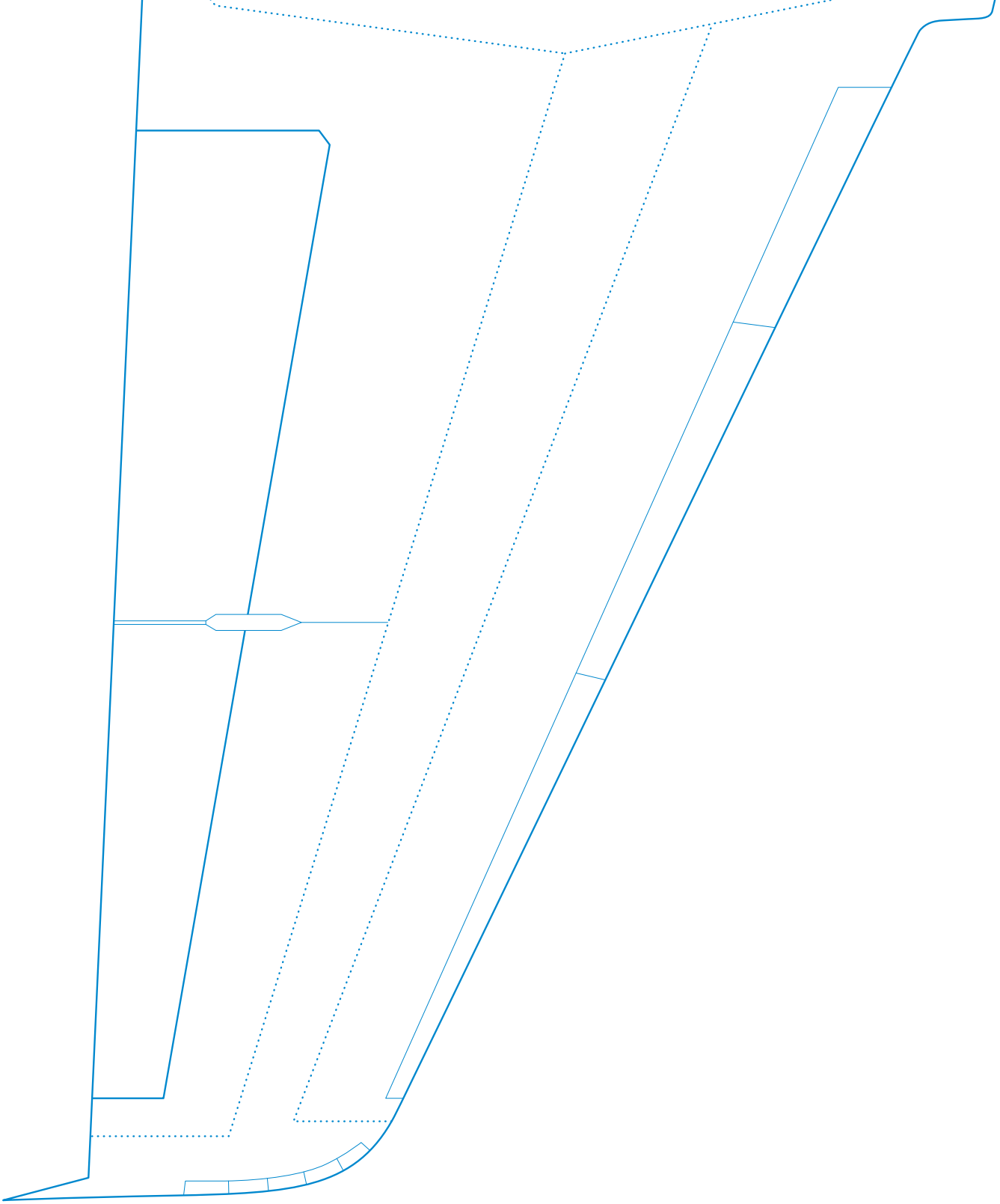


Proportion of Fatal Accidents by Aircraft Category – Accidents in EASA MS Involving General Aviation Aircraft Below 2,250 kg MTOM, 2008 – 2012



Overview of the Number of Accidents, Fatal Accidents and Fatalities by Aircraft Category And Operation Type – All EASA MS Registered General Aviation Aircraft Below 2,250 kg MTOM

Aircraft category	Period	Total number of accidents	Number of fatal accidents	Number of fatalities on board	Number of ground fatalities
Balloons	2007-2011(average per year)	11.0	0.4	0.6	0
	2012	12	1	3	0
Dirigibles	2007-2011(average per year)	0	0	0	0
	2012	0	0	0	0
Aeroplanes	2007-2011(average per year)	486.2	61.8	121.0	1.2
	2012	397	51	108	0
Gliders	2007-2011(average per year)	238.8	28.6	36	0.2
	2012	215	30	33	0
Gyroplanes	2007-2011(average per year)	15.4	4.2	5.0	0.2
	2012	19	4	6	0
Helicopters	2007-2011(average per year)	56.2	8.2	18.0	0.6
	2012	37	6	15	1
Microlights	2007-2011(average per year)	222.2	38.0	55.4	0.2
	2012	219	39	59	0
Other	2007-2011(average per year)	4.8	2.6	3.0	0
	2012	14	1	1	0
Motorgliders	2007-2011(average per year)	1.0	0	0	0
	2012	5	1	1	0
Average Total	**2007-2011**	**1035.6**	**143.8**	**239.0**	**2.4**
Total	**2012**	**918**	**133**	**226**	**1**
Change (%)	**2012 over previous**	**-11%**	**-8%**	**-5%**	**-58%**



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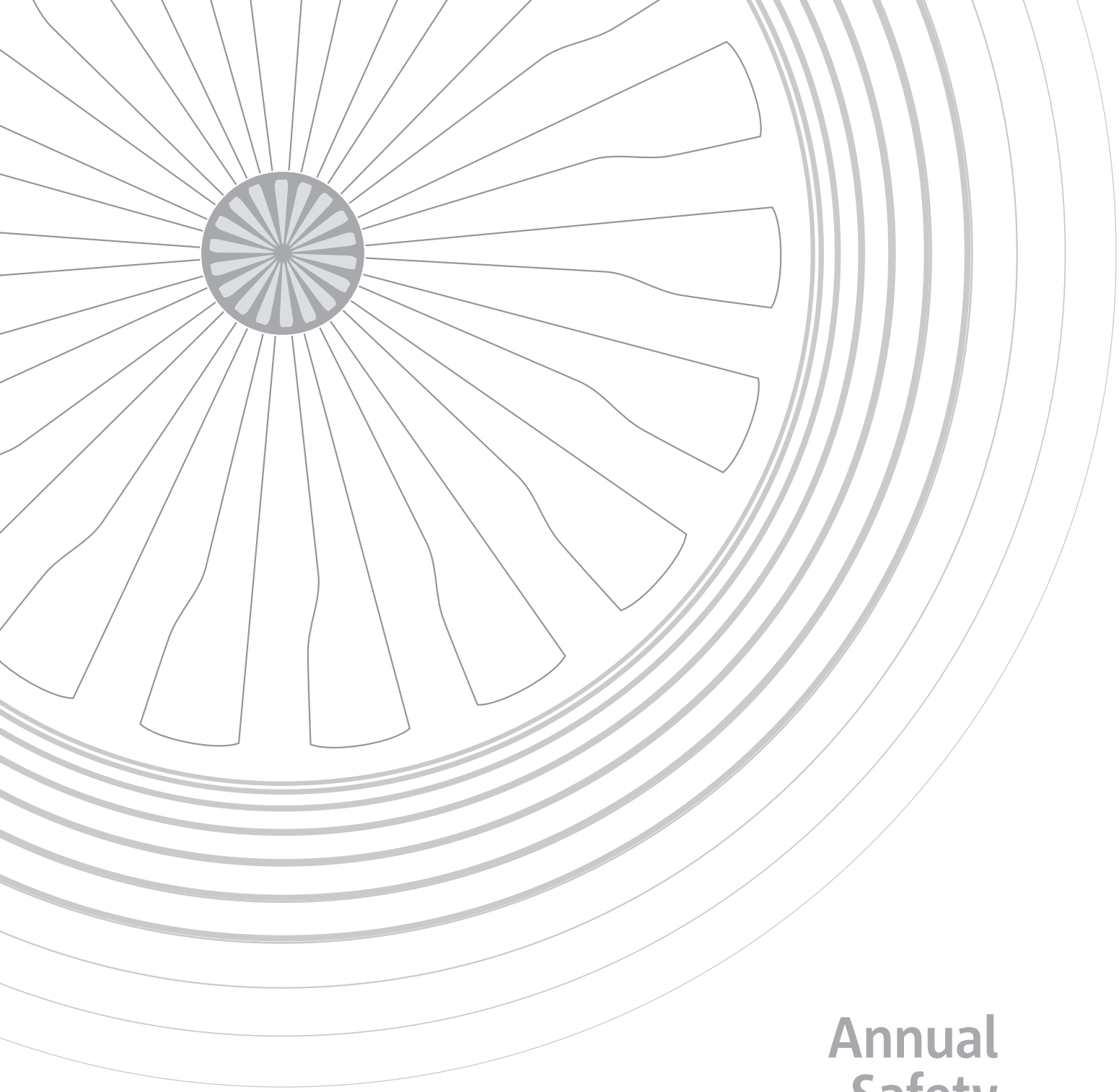

Annual Safety Review 2012

EUROPEAN AVIATION SAFETY AGENCY
AGENCE EUROPÉENNE DE LA SÉCURITÉ AÉRIENNE
EUROPÄISCHE AGENTUR FÜR FLUGSICHERHEIT

Contents

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The accident data presented is strictly for information purposes only. It is obtained from Agency databases comprised of data from ICAO, EASA Member States and the aviation industry. It reflects knowledge at the time the report was generated.

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Photocredits

Inside front cover (from left to right): *Airbus SAS, Vasco Morao, Airbus SAS, Thales Alexis Frespuech, Vasco Morao, Daher Socata, Agusta Westland, Photopointcom ∏THALES, DFS Deutsche Flugsicherung GmbH, Airbus SAS, Rolls Royce, Sikorsky/* Page 4: *Vasco Morao/* Page 8: *Agustawestland/* Page 12: *Photopointcom ∏THALES/* Page 16: *Daher Socata/* Page 24: *Airbus/* Page 36: *Sykorsky/* Page 42: *Vasco Morao/* Page 54: *Airbus/* Page 62: *DFS Deutsche Flugsicherung GmbH/* Page 72: *Thales Alexis Frespuech/* Page 80: *RollsRoyce/* Page 82: *Airbus*

Executive Summary

The Annual Safety Review presents statistics on European and worldwide aviation safety.

Data included in the Review comes from a variety of different sources, covering accident and serious incident data as well as contributions from National Aviation Authorities, Eurocontrol, EUROSTAT, Ascend and the ICAO Safety Indicators Study Group. The review covers the period 2003-2012, however where there is not enough data available the analysis is limited to 2008-2012.

The worldwide rate of fatal accidents for scheduled passenger and cargo flights has continued to decrease, providing a steady improvement in aviation safety. The rate of fatal accidents in EASA MS is comparable with and slightly lower than North America.

There were 105 million IFR flights in the EASA Member States (MS) flight information regions in ten years.

The number of flights in 2012 was 10.5 million, which is still less than the peak of 11.2 million flights per year in 2008. 67% of flights are traditional scheduled flights, 27% are low-cost scheduled flights and 6% are charter flights. In 2012, 925 million passengers and 14.5 million tonnes of cargo were carried in EASA MS.

The number of Commercial Air Transport fatal accidents in 2012 was less than the 10-Year average.

For Commercial Air Transport Aeroplanes between 2001 and 2010 there was an average of 25 accidents per year, including 3 fatal accidents per year. In 2012 there were 34 accidents, of which 1 was fatal. The fatality occurred when a ground operator was killed during aircraft loading. The most common type of accident is an “abnormal runway contact” while the most common type of fatal accident is a “loss of control in flight”.

For Commercial Air Transport Helicopters between 2001 and 2010, there was an average of 13 accidents per year, including 3 fatal accidents per year. In 2012 there were 11 accidents, of which 2 were fatal. The most common type of accident is a “loss of control in flight” while the most common type of fatal accident is a “controlled flight into terrain”.

The number of accidents involving General Aviation light aircraft has decreased by 10% compared with the previous five-year period.

The number of fatal accidents decreased by 7%. However, exposure data for these aircraft is not available so it is not known whether there has been less general aviation activity as a result of the economic downturn and poor weather in 2012.

Accidents and Serious Incidents relating to EASA MS aerodromes are becoming less common

Commercial, ILS-equipped Aerodromes in EASA MS have had 15 accidents and serious incidents in the period 2008-2012 where the aerodrome contributed to the occurrence in some way. The most common occurrence category to be assigned to an aerodrome accident or serious incident is “runway excursion”.

There were 345 ATM-relevant accidents between 2008 and 2012

Air Traffic Management safety is analysed using data provided by Eurocontrol and collected as part of the “Annual Summary Template” mechanism. The most common types of occurrence (accidents, serious incidents and incidents) are Unauthorised Airspace Penetration and the rate of reported incidents has increased between 2003 and 2012. However, the number of serious and major incidents has remained stable, indicating that the overall increase relates to reporting.

The European Central Repository is a centralised database of safety occurrences from all EASA MS.

The amount of information in the ECR is increasing every year and the quality of data has improved significantly over the past 2 years. At the end of 2012 there were in total 664,149 occurrences in the ECR. Since 2009 the number of occurrences has begun to stabilise in the region of 100,000 to 120,000 occurrences per year.

1 Introduction

Background

Air transport is widely considered as one of the safest forms of travel. In Europe it is also one of the fastest growing. In order to continuously improve aviation safety in Europe, EASA and its stakeholders monitor aviation safety statistics to understand both the current situation and areas of possible improvement. This document provides a high-level overview of aviation safety statistics for Europe and worldwide.

The Annual Safety Review is published by EASA to inform the public of the general safety level in the field of civil aviation. The Agency provides this review on an annual basis as required by Article 15(4) of Regulation (EC) No 216/2008 of the European Parliament and of the Council of 20 February 2008.

EASA as an Agency is responsible for providing common standards of safety and environmental protection in civil aviation in Europe and worldwide. It is the centrepiece of regulations creating a single European market in the aviation industry. The Agency's responsibilities include:

- expert advice to the EU for drafting new legislation;
- implementing and monitoring safety rules, including inspections in the Member States;
- type-certification of aircraft and components, as well as the approval of organisations involved in the design, manufacture and maintenance of aeronautical products;
- authorisation of third-country (non EU) operators;
- safety analysis and research.

The Agency's responsibilities are growing to meet the challenges of the fast-developing aviation sector. In the future, the Agency will also be responsible for safety regulations for airports and air traffic management systems.

Scope

The Annual Safety Review presents statistics on European and worldwide aviation safety. The statistics are grouped according to type of operation, such as commercial air transport or general aviation, and aircraft category, such as aeroplanes, helicopters or gliders.

The data included in the Review comes from a variety of different sources:

- Accident and Serious Incident data for most aircraft categories comes from the database of the EASA Safety Analysis and Research Department.
- Aircraft data for aircraft below 2,250 kg MTOM was provided by EASA member states
- ATM data was provided by Eurocontrol,
- Air Transport Statistics were provided by Eurocontrol and by EUROSTAT,
- Exposure data for commercial air transport was provided by Ascend.

As with all sources of information, the data is subject to slight changes over time as more information is added that may cause an accident or serious incident to be re-categorised. For this reason, the figures presented in the Annual Safety Review 2012 are likely to be slightly different to those presented in previous years.

In this review, the terms "Europe" and "EASA Member States (MS)" are considered as the 27 EU Member States plus Iceland, Liechtenstein, Norway and Switzerland. For Commercial Air Transport operations the region is assigned based on the state of operator of the aircraft involved, while for all other types of operation the state of registry is used.

The figures presented in the Review are high level and do not contain statistical tests. This is because the aim of the document is to provide a simple overview of the safety of aviation in Europe and worldwide, it is not intended as a complex technical document. However, the figures presented can be used as a reference and readers are invited to make use of the figures presented to apply their own tests and draw conclusions from these.

Content of the Review

The Annual Safety Review aims to cover all aspects of aviation that fall within EASA's remit. Consequently, the document has been divided into the following chapters: Worldwide Aviation Safety, Air Transport Statistics in EASA MS, Commercial Air Transport, Aerial Work, General Aviation, Aerodromes, Air Traffic Management, and European Central Repository.

As with the previous version of the Review, specific information related to safety activities of the Agency is no longer provided. This information is now presented in the European Aviation Safety Plan (EASp), which can be found at: http://easa.europa.eu/sms/

A list of acronyms and definitions can be found in Appendix 1. Appendix 2 provides a list of figures and tables and Appendix 3 provides a list of commercial air transport fatal accidents worldwide in 2012.

2

Worldwide Aviation Safety

This chapter provides information on the worldwide fatal accident rate for aeroplanes with a maximum take-off mass above 2,250 kg, engaged in scheduled passenger or cargo operations. Acts of unlawful interference are not included in these figures.

Figure 1 shows the number and rate per 10 million flights of passenger and cargo fatal accidents each year from 1993 to 2012. It can be seen that over the 20-year period there has been a significant reduction in the number and rate of fatal accidents.

Figure 1: Number and Rate per 10 Million Flights of Scheduled Passenger and Cargo Fatal Accidents Worldwide per Year, 1993-2012

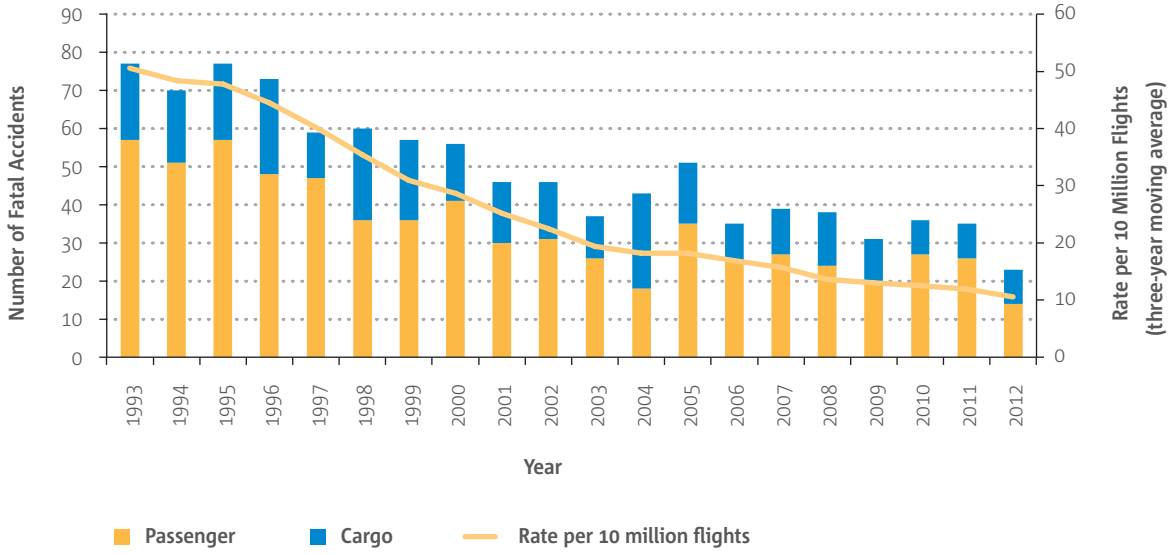


Figure 2 shows the fatal accident rate by region of the world, using the regions defined by the ECCAIRS taxonomy.

Figure 2: Rate of Scheduled Passenger and Cargo Fatal Accidents, per 10 Million Flights by World Region, 2003-2012

3

Air Transport Statistics in EASA Member States

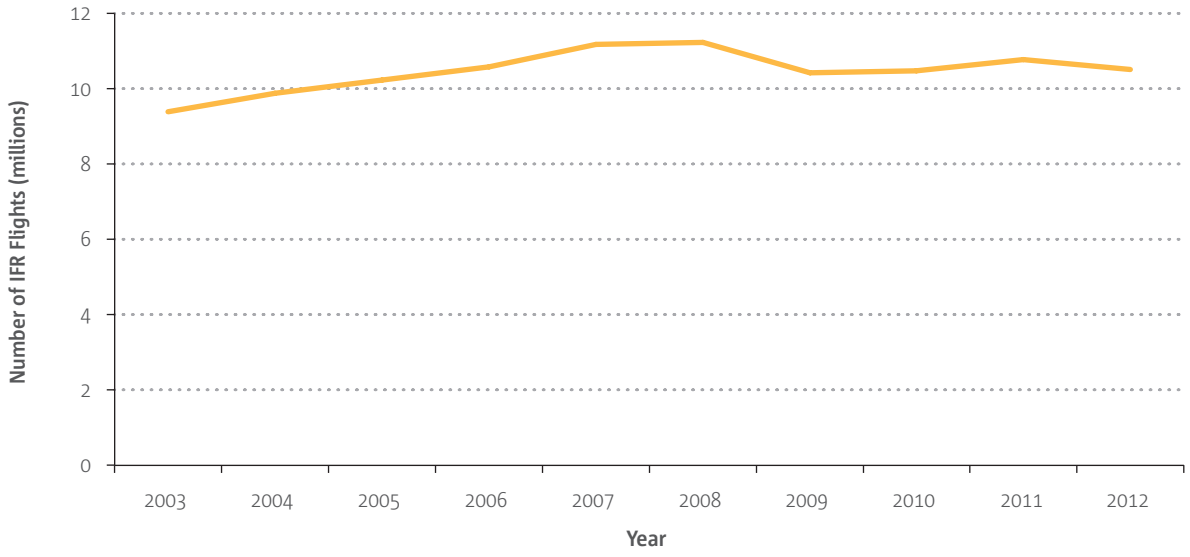
Introduction

This chapter reviews air traffic, passengers carried and cargo transported in EASA Member States (MS). Air traffic data is sourced from Eurocontrol Statistics and Forecasts (STATFOR) and excludes Liechtenstein, which does not have a flight information region. Passenger and cargo data is sourced from EUROSTAT and is publicly available online. Timespans for the data presented vary due to the differing availability of the source data.

Flights in EASA MS Flight Information Regions

Between 2003 and 2012, there were approximately 105 million Instrument Flight Rules (IFR) flights in the EASA MS flight information regions. Figure 3 shows the number of flights per year. It can be seen that the number of flights per year has levelled off, following a decrease between 2008 and 2009. There were 10.5 million IFR flights in 2012, compared with 11.2 million in 2008.

Figure 3: Number of IFR Flights in EASA MS per Year, 2003 - 2012



Market Segments

The number of flights per year by market segment is shown in Figure 4 for the five year period of 2008-2012 inclusive, covering low cost, scheduled and charter flights, but excluding other types of flight. Low cost flights have experienced some growth between 2008 and 2012, with 2.4 million flights in 2008 increasing to 2.6 million flights in 2012, an 11% increase. The proportion of flights in each sector is shown in Figure 5: 67% of flights are traditional scheduled flights, 27% are low-cost scheduled flights and 6% are charter flights.

Figure 4: Number of IFR Flights in EASA MS per Year by Market Segment, 2008-2012

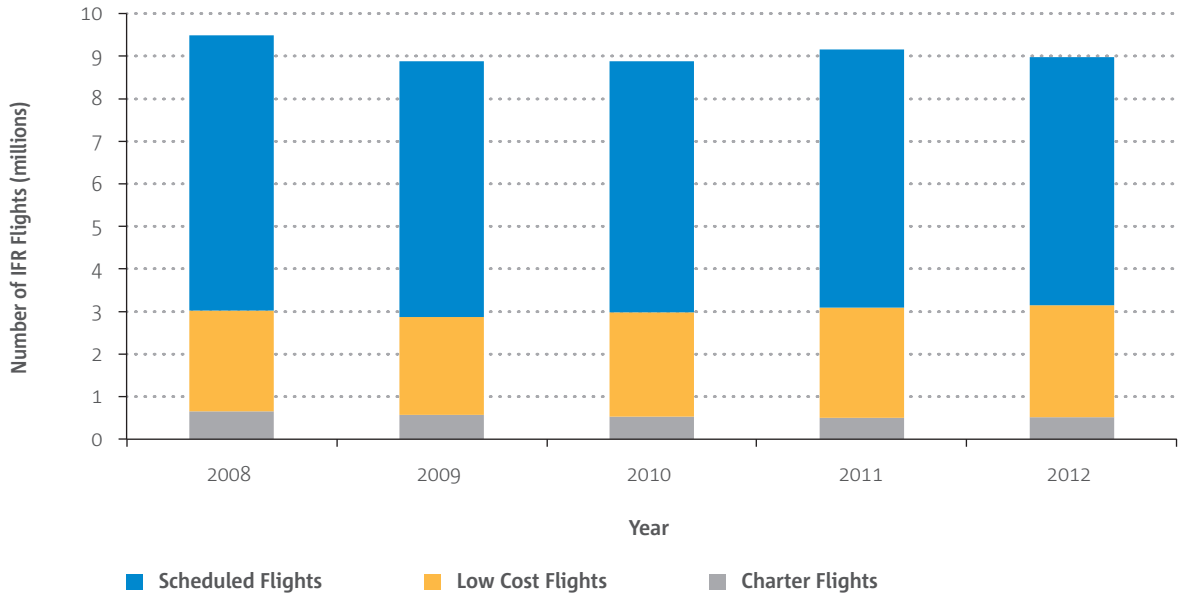
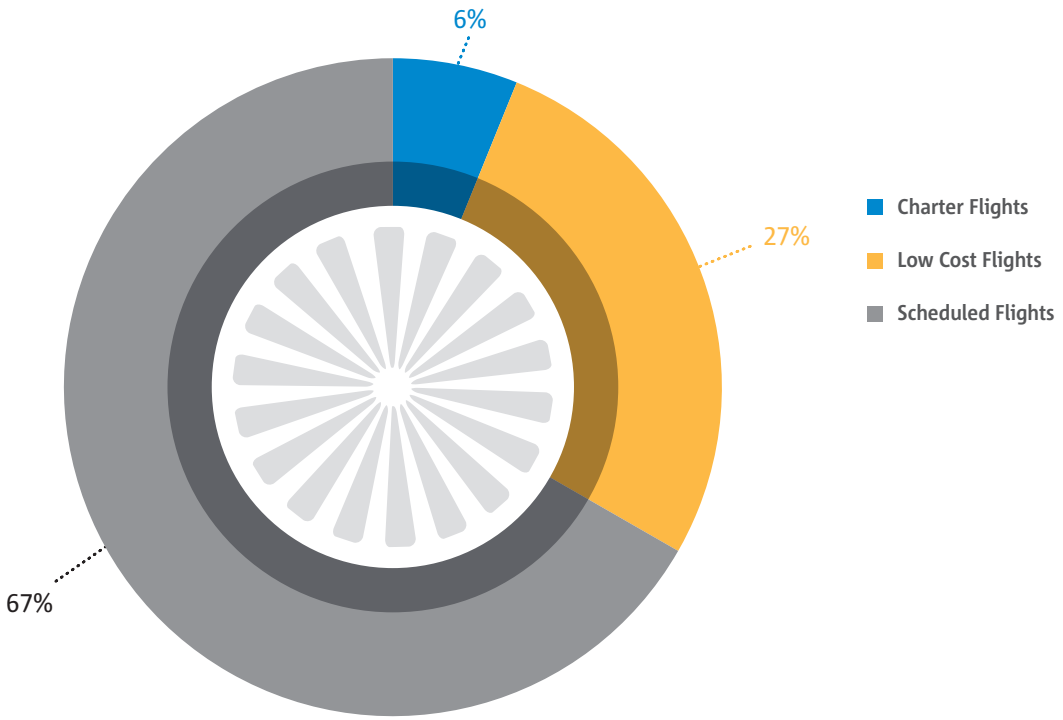


Figure 5: Proportion of Flights in Each Market Segment, 2008-2012



Flights Conducted by EASA Member States Registered Aircraft

The types of aircraft filing a flight plan are recorded by the Eurocontrol Central Flow Management Unit and the data has been used below to show the number and types of EASA MS registered aircraft operating in European airspace.

Figure 6: Number of EASA MS Registered Aircraft Filing Flight Plans, 2008-2012

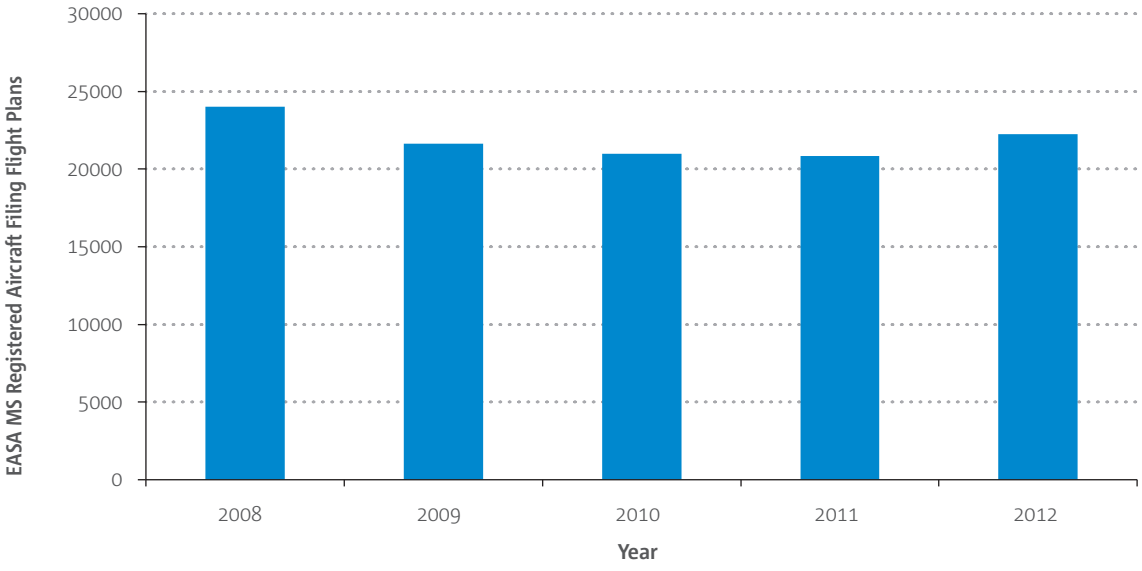


Figure 7: Number of EASA MS Registered Aircraft Filing Flight Plans by Aircraft Category, 2008-2012

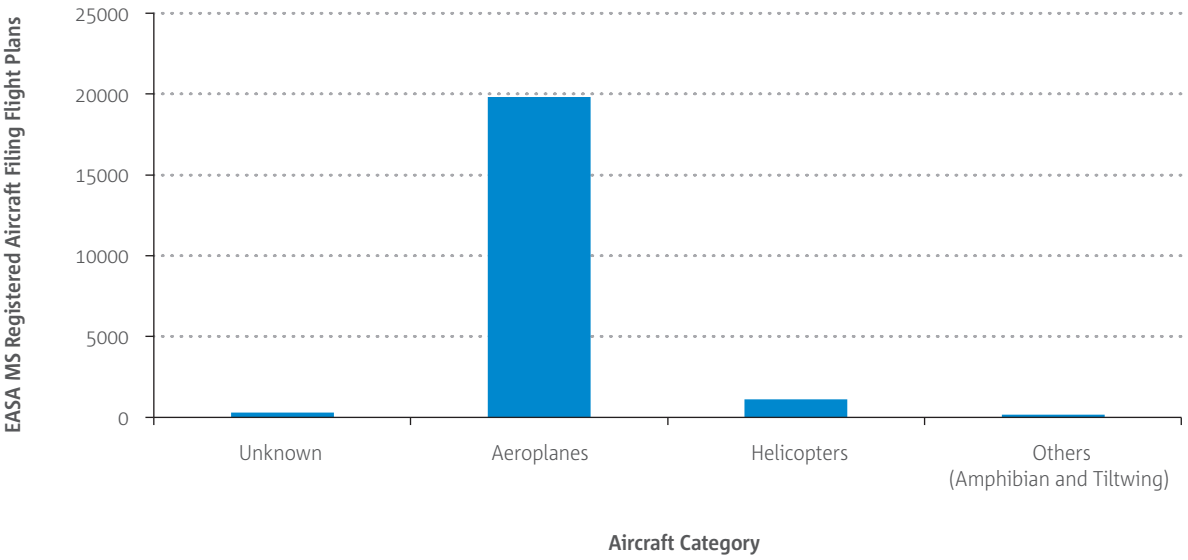
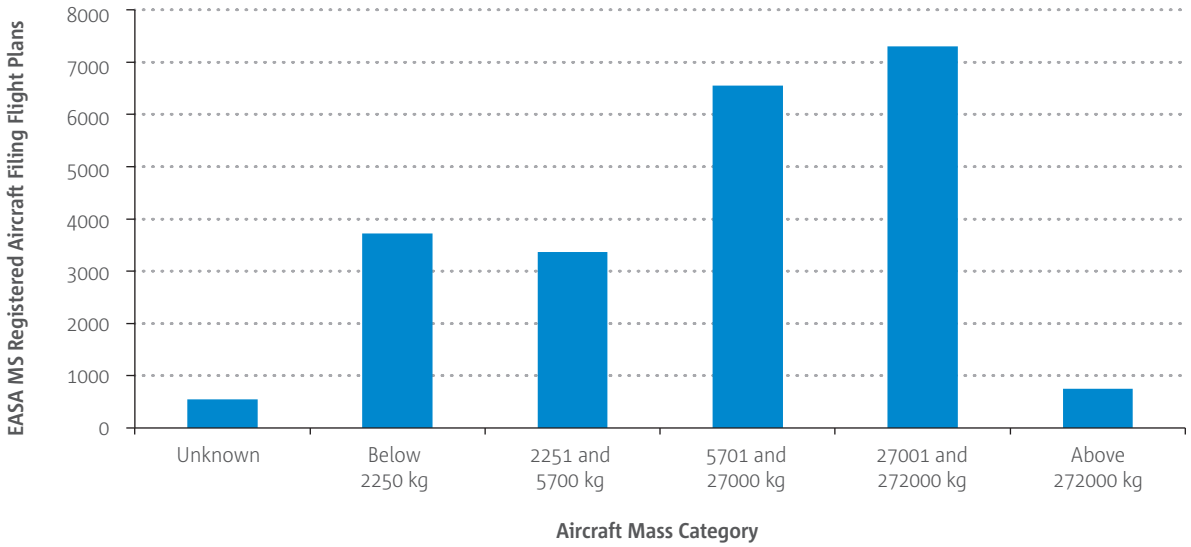


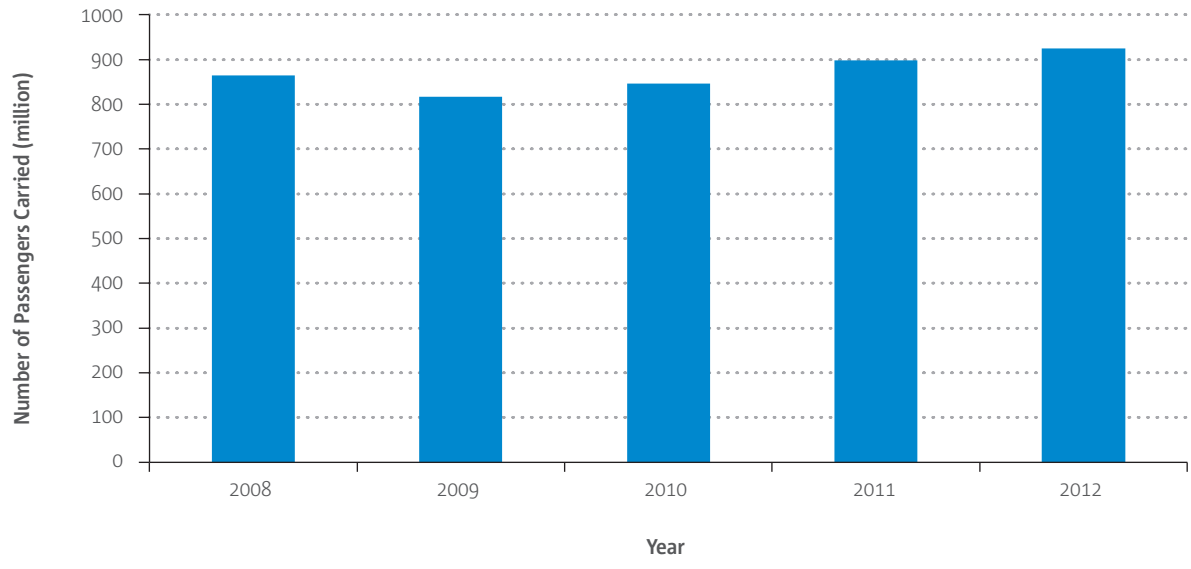
Figure 8: Number of EASA MS Registered Aircraft Filing Flight Plans by Aircraft Mass Category, 2008-2012



Movement of Passengers and Cargo

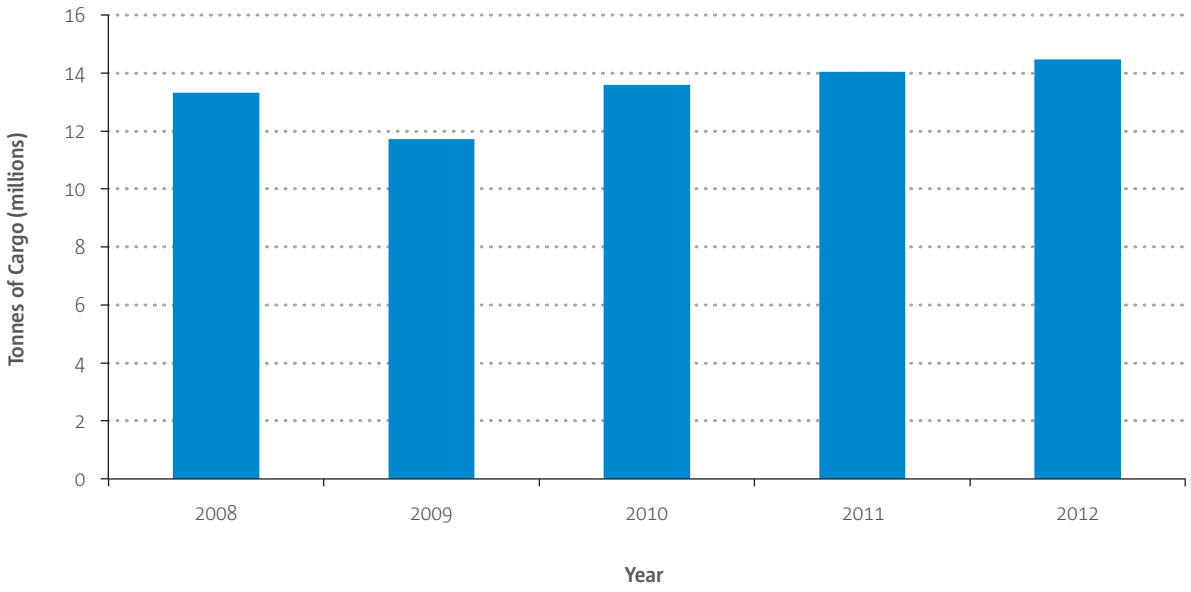
This section shows the number of passengers carried and amount of cargo transported in the EASA MS from 2008 to 2012, the data is sourced from EUROSTAT. Over the five year period approximately 4.4 billion passengers were carried in the EASA MS. The total number of passengers carried in the EASA MS per year is shown in Figure 9.

Figure 9: Number of Passengers Carried Per Year in EASA MS, 2008-2012



The amount of cargo transported per year between 2008 and 2012 is shown in Figure 10. Over the five year period approximately 67.1 million tonnes of cargo was transported in EASA MS.

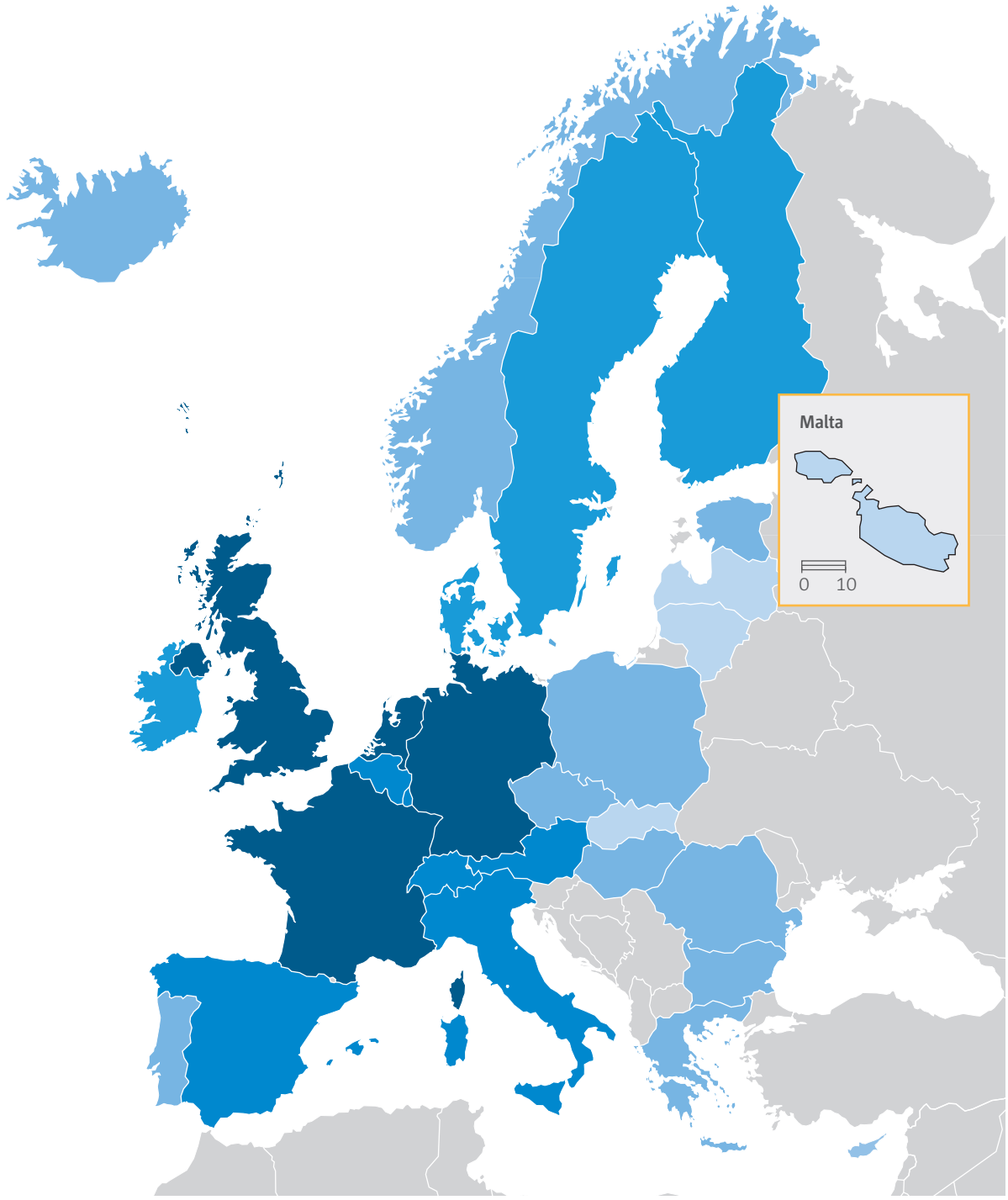
Figure 10: Tonnes of Cargo Carried per Year in EASA MS, 2008-2012



Maps showing the numbers of passengers carried and cargo transported in each EASA MS country for 2008-2012 are shown in Figure 11 and Figure 12.

Figure 11: Number of Passengers Carried per Country, 2008-2012

Figure 12: Tonnes of Cargo Transported per Country, 2008-2012



4

Commercial Air Transport

Introduction

The Commercial Air Transport (CAT) operations analysed in this chapter involve the transportation of passengers, cargo, mail for remuneration or hire and ferry/positioning flights. Aircraft accidents are aggregated by the State in which the aircraft operator was registered. Accidents and fatal accidents are identified as such using the definitions of ICAO Annex 13 "Aircraft Accident and Incident Investigation". The first section of this chapter focusses on aeroplanes above 2,250 kg maximum take-off mass (MTOM), the second on helicopters, then the final section on balloons.

Aeroplanes

In 2012 there was a single fatal accident involving a EASA Member State (EASA MS) operated aircraft. This occurred in November 2012 when a ground operator became trapped between the baggage door of an Airbus A320 and a baggage loader during the boarding of an aircraft at Rome Fiumicino Airport. Table 1 shows that the number of fatal accidents and the number of fatalities in 2012 was below the average in the previous decade. The 34 accidents in 2012 represents a small increase compared to the 30 in 2011 and it is slightly higher than the average in the previous decade (25). In 2012, there were no onboard fatalities in accidents involving EASA MS operators.

Table 1: Overview of Total Number of Accidents, Fatal Accidents and Fatalities for EASA MS Operated Aeroplanes, above 2,250 kg MTOM

Period	Number of Accidents	Fatal Accidents	Fatalities on Board	Ground Fatalities
2001-2010 (Average per Year)	25.2	3.4	77.8	0.8
2011 (Total)	30	1	6	0
2012 (Total)	34	1	0	1

Figure 13 shows that the number of fatal accidents involving EASA MS operated aeroplanes has decreased over the past decade. There has been not been a year with more than one fatal accident involving an EASA MS operated aeroplane since 2007. For operators outside the EASA MS ('third country operators') there has been a further reduction in fatal accidents from 37 in 2011 to 28 in 2012.

Figure 13: Number of Fatal Accidents in EASA MS and Third Country Operated CAT Aeroplanes, MTOM Above 2,250 kg, 2003-2012

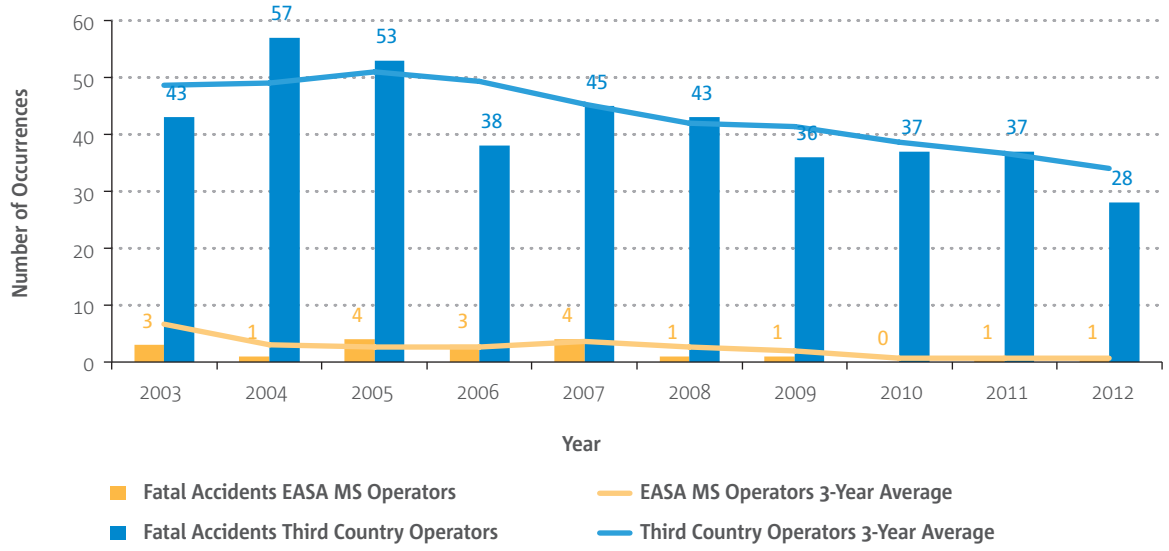
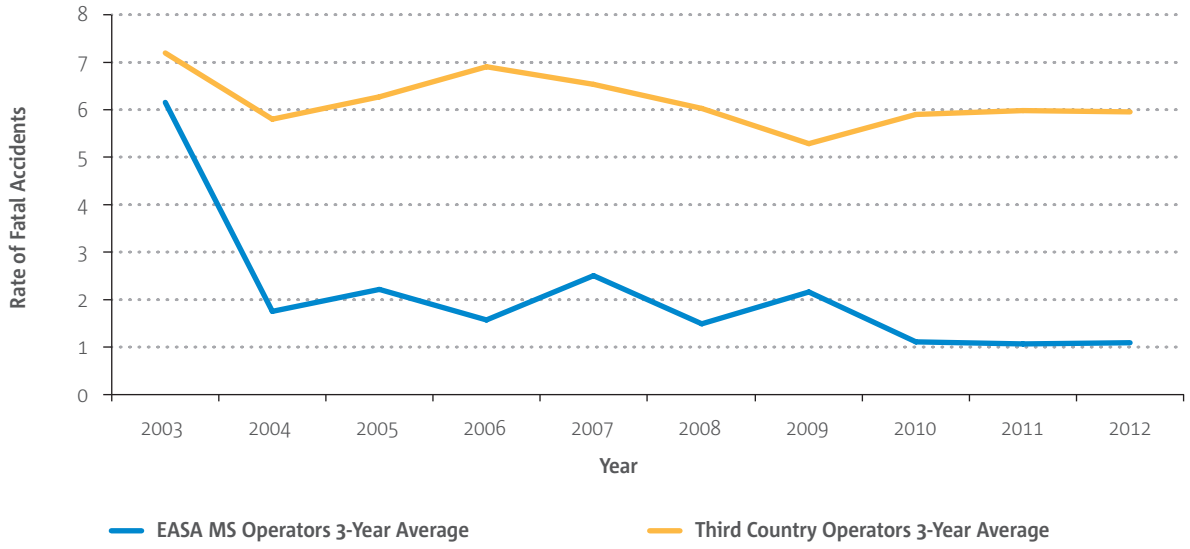


Figure 14 shows that the rates of fatal accidents for both EASA MS and third country operated aeroplanes has remained at the same level for the past 3 years. For EASA MS operators this shows that the historically low rate of fatal accidents has been maintained after the significant reduction between 2003 and 2004. The rates of fatal accidents are created by comparing the number of fatal accidents in scheduled passenger operations with the number of flights carried out.

Figure 14: Rate of Fatal Accidents in EASA MS and Third Country Scheduled Passenger Operations, Aeroplanes Above 2,250 kg MTOM, 2003-2012



Fatal Accidents by Mass Category

Figure 15 shows the distribution of fatal accidents by aircraft mass category for operators based in the EASA MS and for third country operators. For EASA MS operated aircraft it shows that 42% of the aircraft involved in fatal accidents were of a mass between 5,701 kg and 27,000 kg, 37% were between 27,001 kg and 272,000 kg, whilst 21% were between 2,251 and 5,700kg. The situation for third country operated aircraft is slightly different with the largest proportion, 40%, involving aircraft between 2,251 kg and 5,700kg. The majority of jet powered aircraft belong to the mass category between 27,001 kg and 272,000 kg. Smaller jet aircraft and most turboprop aircraft belong to the mass category between 5,701 kg and 27,000 kg, whilst light turboprop aircraft are generally found in the 2,251 kg to 5,700 kg mass category.

Figure 15: Proportion of Fatal Accidents by Aircraft Mass Category, EASA MS Operated CAT Aeroplanes above 2,250 kg MTOM, 2003-2012

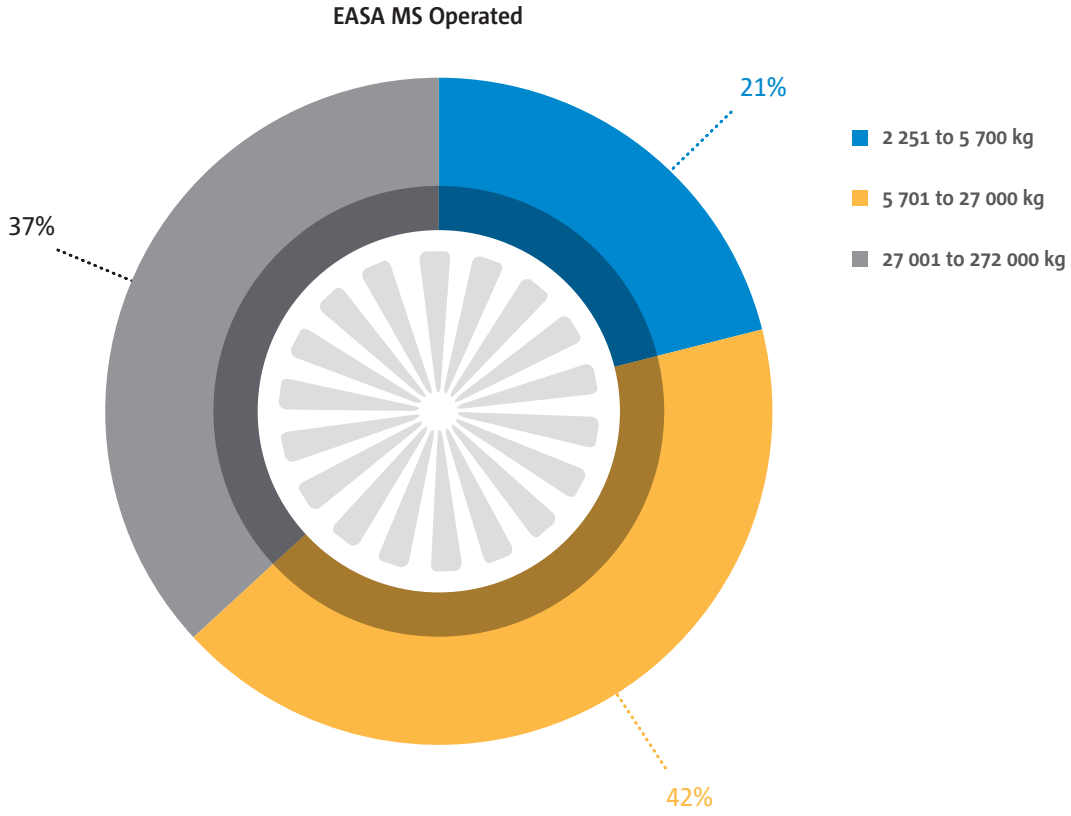
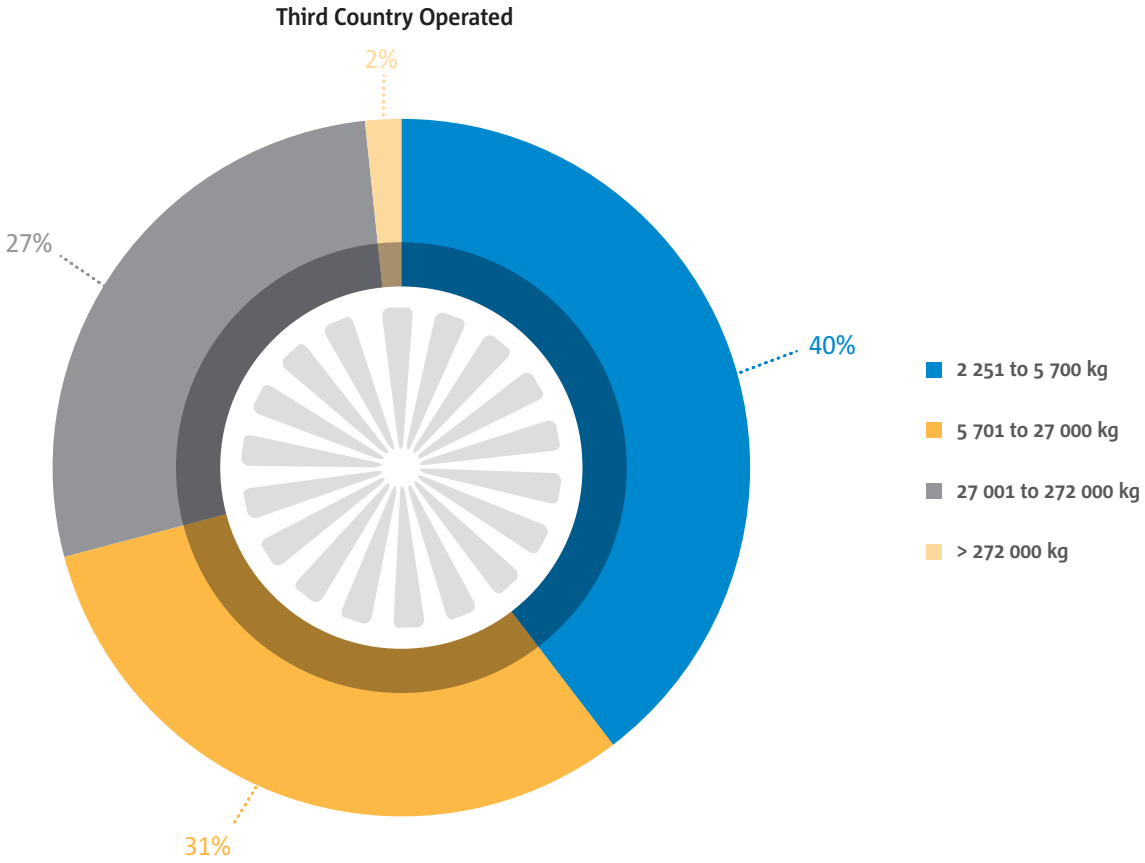


Figure 16: Proportion of Fatal Accidents by Aircraft Mass Category, Third Country Operated CAT Aeroplanes above 2,250 kg MTOM, 2003-2012

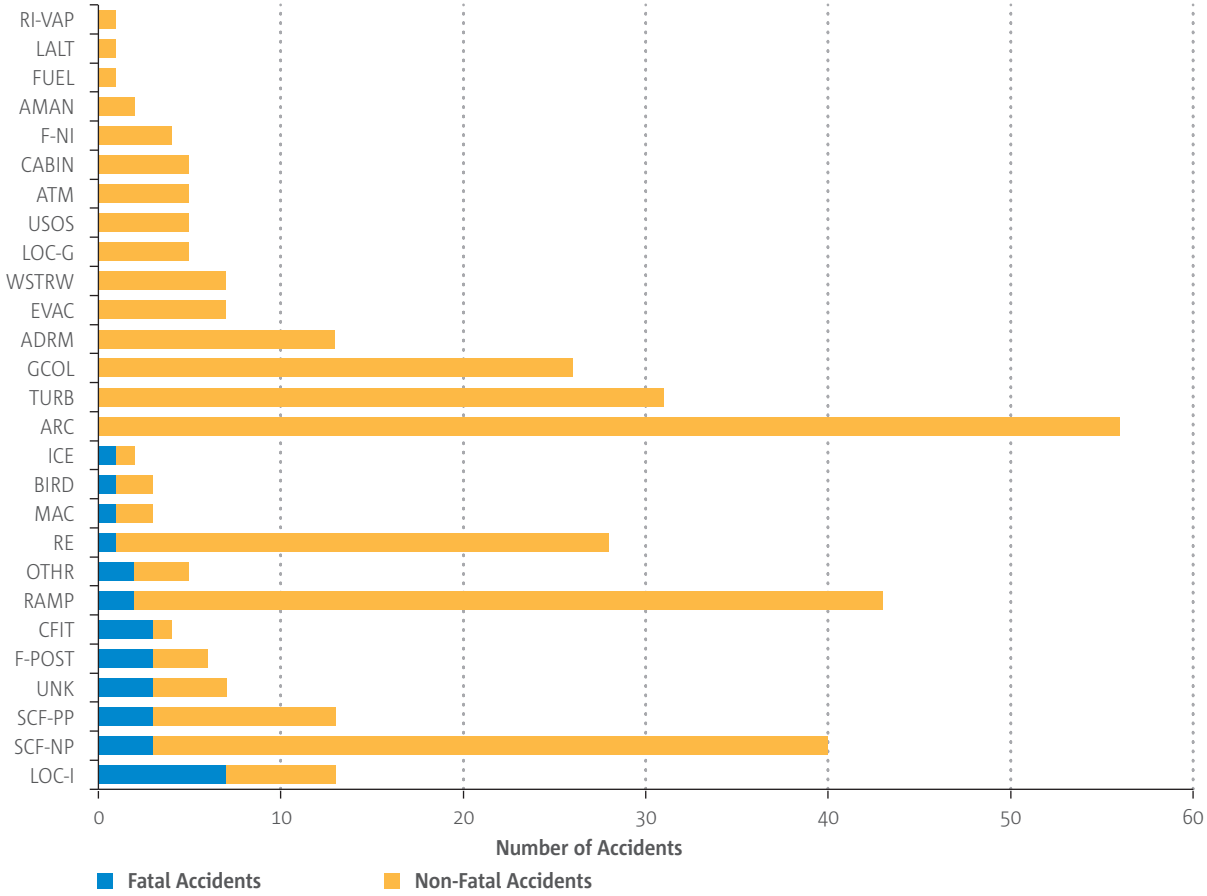


Accident Categories

The assignment of an accident under a single or multiple occurrence category assists in the identification of particular safety issues. Accident categories were assigned to fatal and non-fatal accidents which involved EASA MS operated aeroplanes based on the definitions of the CAST-ICAO Common Taxonomy Team (CICTT). The CICTT have developed a common taxonomy for the classification of occurrences for accident and incident reporting systems. Further information about the categories used in this report can be found in Appendix 1: Definitions and Acronyms. An accident may have more than one category, depending on the circumstances contributing to the accident.

Figure 17 provides details of the accident categories with the highest number of fatal and non-fatal accidents in the decade 2003-2012. The highest number of fatal accidents, 7 in total, have been assigned the occurrence category Loss of Control - In Flight (LOC-I), which involves the momentary or total loss of control of the aircraft by the flight crew. This might be the result of reduced aircraft performance or because the aircraft was flown outside its capabilities for control. During the period 2003-2012, the number of fatal accidents (3) were the same for the categories System/ Component Failure - Non-Powerplant (SCF-NP), System/ Component Failure - Powerplant (SCF-PP), Unknown (UNK), Fire/ Smoke - Post Impact (F-POST) and Controlled Flight Into Terrain (CFIT). The highest number of non-fatal accidents involved the occurrence category Abnormal Runway Contact (ARC), which include long, fast or hard landings as well as the scraping of the tail or wing of the aircraft during take-off or landing.

Figure 17: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS CAT Aeroplanes above 2,250 kg MTOM, 2003-2012



Helicopters

The following section provides an overview of accidents in helicopter CAT operations. Unless otherwise noted, the presented data covers all mass categories. This is a change compared with the previous version of the Annual Safety Review, which only included aircraft above 2,250 kg MTOM.

Table 2 shows that in 2012 there were 11 accidents, of which 2 were fatal, involving CAT helicopter operators from the EASA MS. Both numbers are below the decade average, though the total number of accidents is higher than the previous year. The number of fatalities is less than half than that of 2011.

Table 2: Overview of Total Number of Accidents, Fatal Accidents and Fatalities for EASA MS Operated Helicopters, All Mass Categories

Period	Number of Accidents	Fatal Accidents	Fatalities on Board	Ground Fatalities
2001-2010 (average)	13.2	3.3	17.6	0.1
2011	9	3	19	0
2012	11	2	8	0

Figure 18 compares the number of fatal accidents involving helicopters with maximum take-off mass above 2,250 kg between operators in EASA MS and those in other regions (third country operators). EASA MS operators did not have any fatal accidents in 2012. For third country operators the number of fatal accidents in 2012 is equal to the 3-year average for the period 2010-2012.

Figure 18: Number of Fatal Accidents in EASA MS and Third Country Operated CAT Helicopters, Above 2,250 kg MTOM

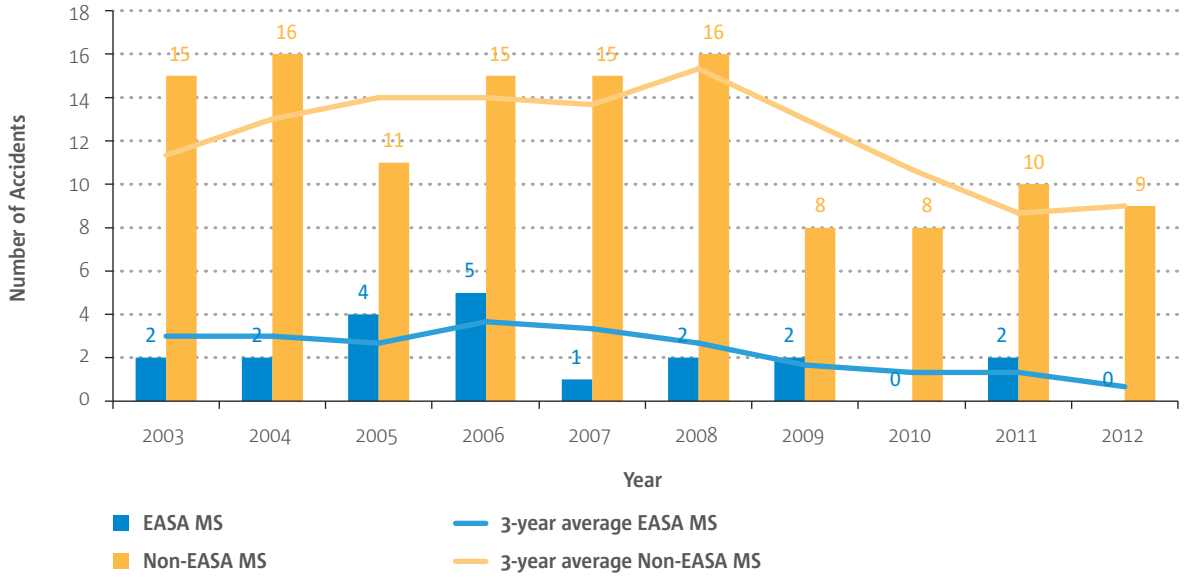
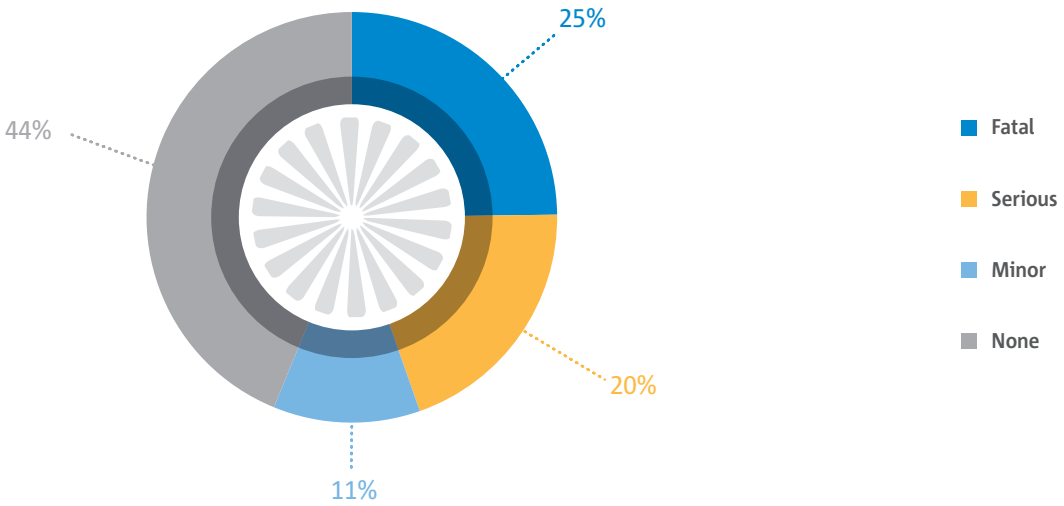


Figure 19 shows the distribution of injuries sustained in CAT helicopter operations. In most accidents (44%) no injuries were sustained. Minor or serious injuries occurred in 31% of the accidents while 25% of the accidents had one or more fatalities.

Figure 19: Proportion of Injury Levels for Accidents in – EASA MS Operated CAT Helicopters, All Mass Categories, 2003-2012



Accidents by Operation Type

Figure 20 shows the number of accidents by operation type in the period 2003-2012. The category "Passenger" has been further broken down to HEMS, Air Taxi and Sightseeing. Conventional Passenger operations have the highest number of accidents in the 10 year period, closely followed by Helicopter Emergency Medical Services (HEMS) operations.

Figure 20: Number of Accidents by Operation Type, EASA MS Operated CAT Helicopters, All Mass Categories, 2003-2012

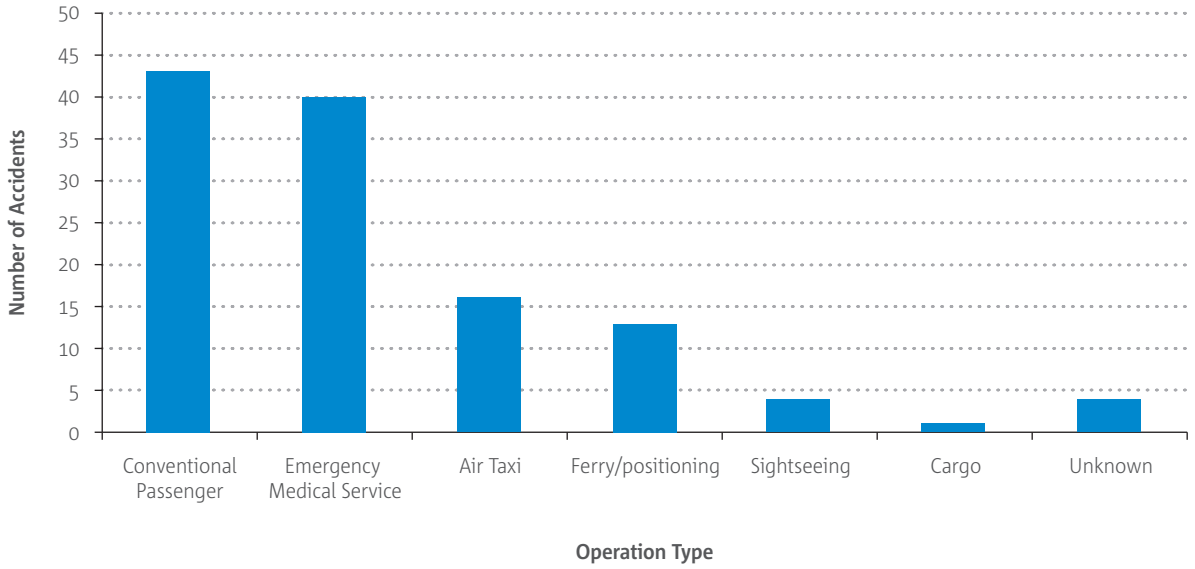
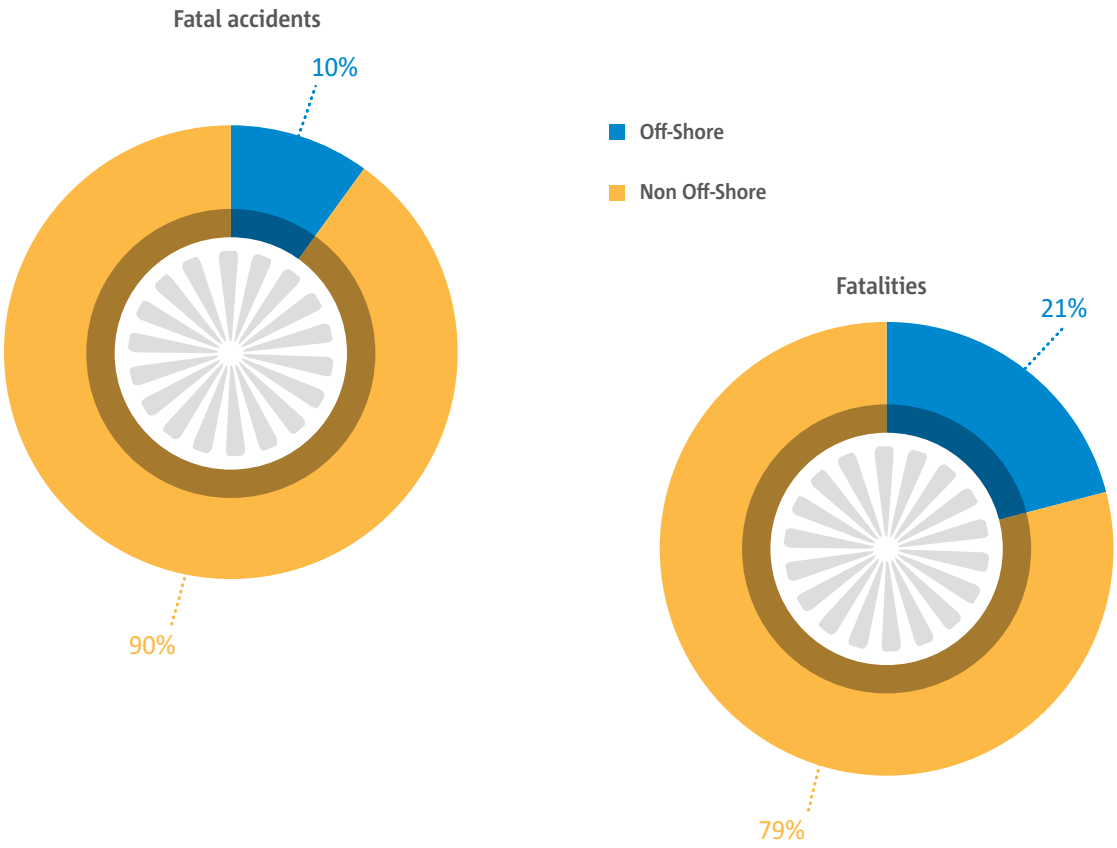


Figure 21 shows the number of fatal accidents and the number of fatalities in off-shore operations and non off-shore operations in the period 2003-2012. 10% of the number of fatal accidents and 21% of the total number of fatalities happened in off-shore operations. In general, off-shore operations are carried out with large helicopters which, when an accident occurs, could give a larger number of casualties. So, although off-shore helicopters have experienced fewer fatal accidents and fatalities, the ratio of fatalities to fatal accidents is higher for this type of helicopter operation (8.67 fatalities per fatal accident) than for non-offshore operations (3.63 fatalities per fatal accident).

Figure 21: Proportion of Fatal Accidents and Fatalities in Off-Shore and Non Off-Shore Operations, EASA MS Operated CAT Helicopters, All Mass Categories, 2003-2012

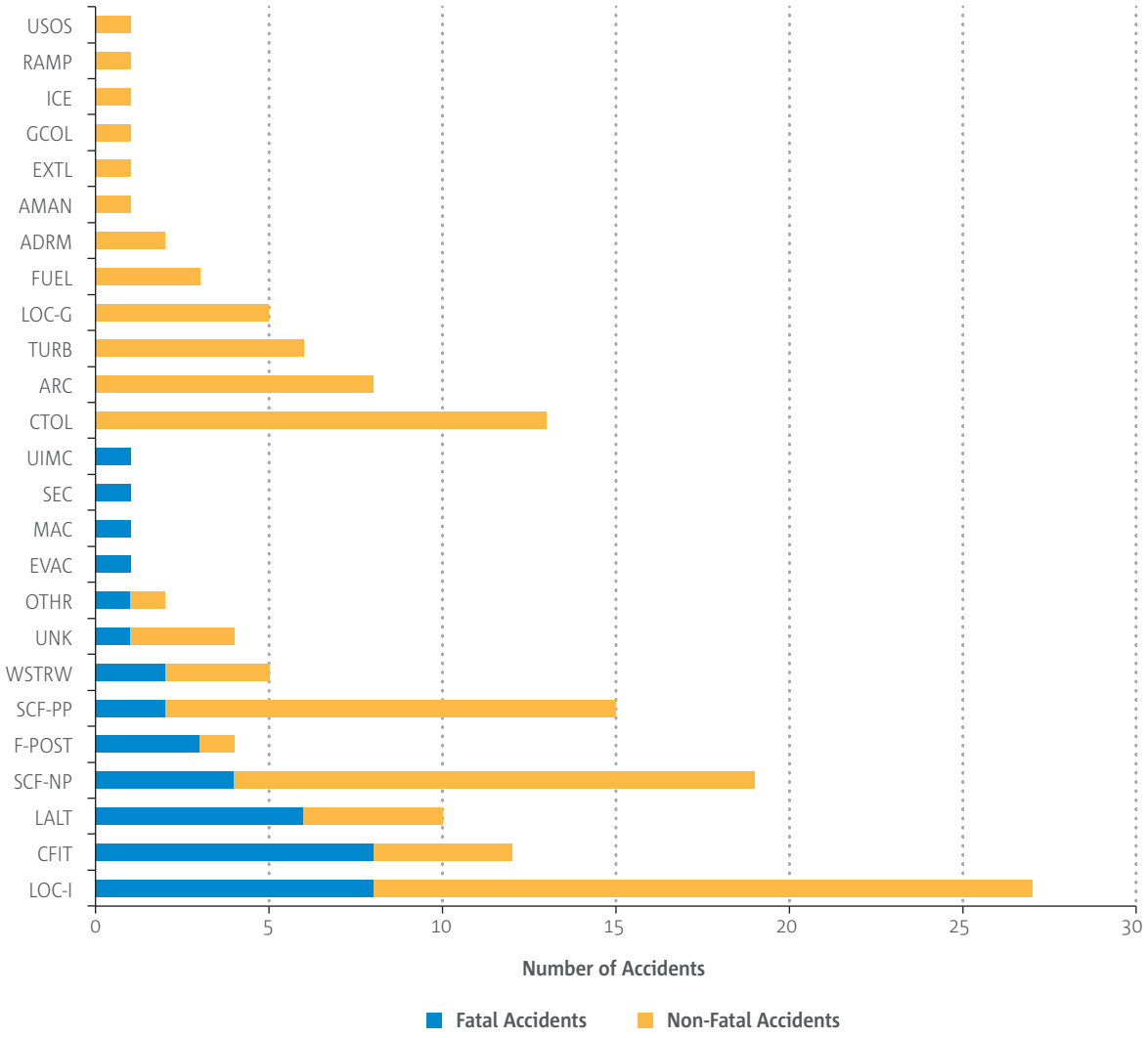


Accident Categories

In order to assist in the identification of particular safety issues, one or multiple occurrence categories were assigned to helicopter accidents involving EASA MS operators. This was done using the CICTT occurrence categories, which are listed in Appendix 1.

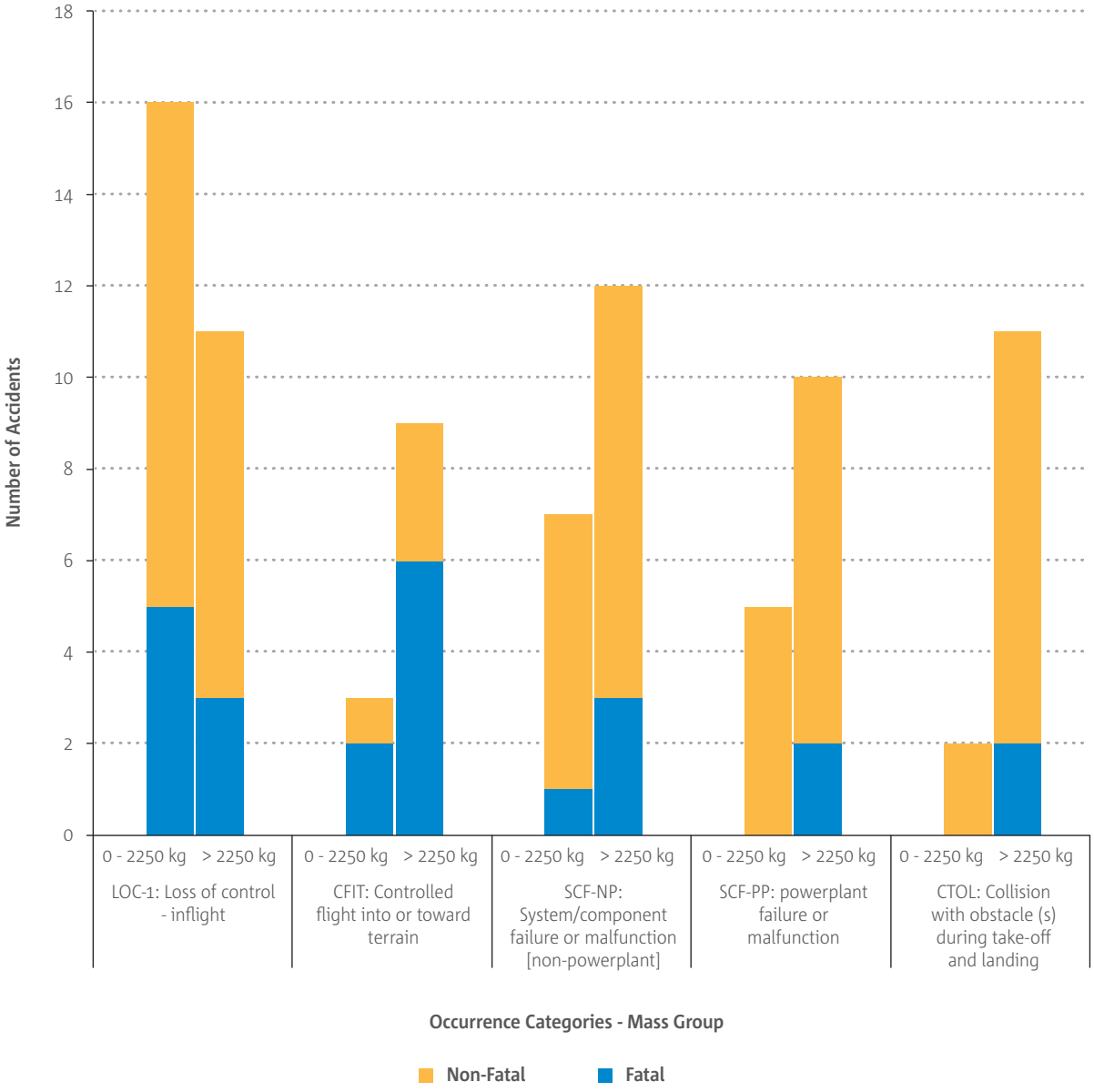
Figure 22 shows that the category with the highest number of accidents is Loss of Control - In Flight (LOC-I) followed by System/Component Failure or Malfunction – Non-Powerplant (SCF-NP) and System/Component Failure or Malfunction – Powerplant (SCF-PP). The category of SCF-NP includes accidents related to a malfunction of the gearbox. Accidents in the category 'Collision with Obstacles during Take-off and Landing' (CTOL) include all accidents during take-off and landing where the main or tail rotor collided with objects on the ground. This category tends to apply to helicopters when the aircraft operate in confined areas close to obstacles. The highest number of fatal accidents involved the occurrence categories LOC-I, CFIT and LALT.

Figure 22: Occurrence Categories for Fatal and Non-Fatal Accidents EASA MS Operated CAT Helicopters, All Mass Categories, 2003-2012



For the 5 occurrence categories with the highest total number of accidents, Figure 23 shows the number of accidents for light (MTOM 0-2,250 kg) and heavy (MTOM above 2,250 kg) helicopters. It is only in LOC-I that the number of accidents is higher for the light helicopters, in the other 4 categories there are a higher number of accidents with heavy helicopters.

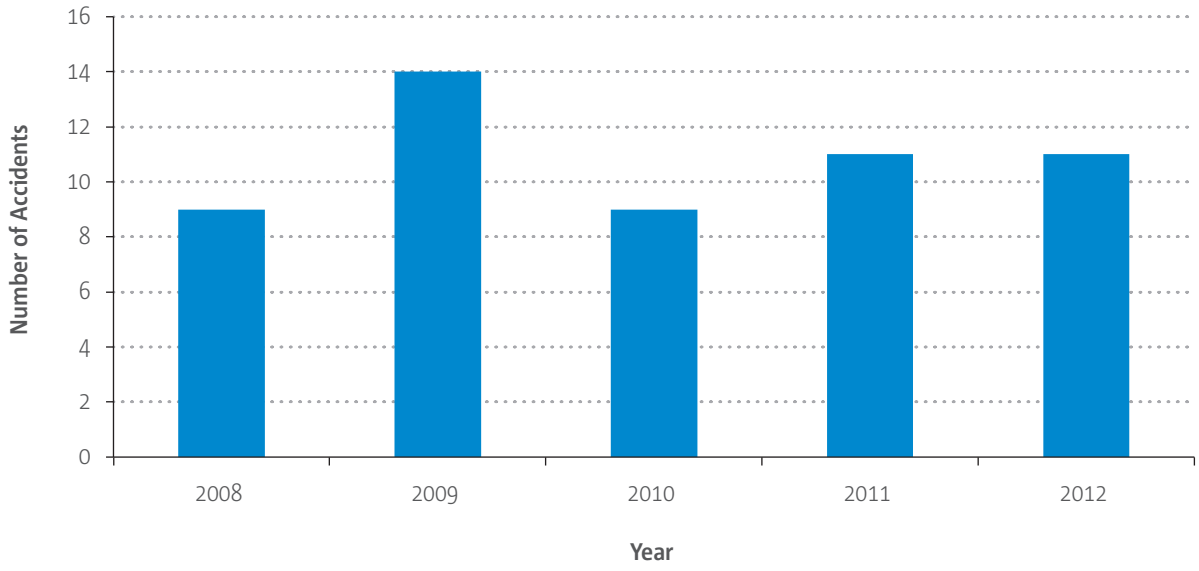
Figure 23: Top 5 Occurrence Categories of Fatal and Non-Fatal Accidents in Helicopters Above and Below 2,250 kg MTOM, 2003-2012



Balloons

This section reviews CAT accidents involving balloons. Between 2008 and 2012, there were 54 balloon accidents. 4 accidents were fatal, of which 2 occurred in 2012. Figure 24 shows the number of accidents per year for balloon CAT.

Figure 24: Number of Accidents Involving EASA MS Registered Balloon CAT, 2008-2012



5 Aerial Work

Introduction

This chapter discusses accidents which involved aircraft of all mass categories in Aerial Work operations. Aerial Work is an operation in which the aircraft is used for specialised services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, and aerial advertisement. The aircraft are identified using the state of registry of the aircraft and categorised as either an EASA Member State (MS) registered aircraft or third-country registered aircraft.

Aeroplane and Helicopter Accidents in Aerial Work

In Table 3 the time period presented extends from 2001 – 2012, showing the number of accidents in 2011 and 2012 as well as the average for the decade preceding these years.

Table 3: Overview of Number of Accidents, Fatal Accidents and Fatalities by Aircraft Category And Operation Type, All Mass Categories, All EASA MS Registered Aerial Work Aircraft

Aircraft category	Period	Number of all accidents	Fatal accidents	Fatalities on board	Ground fatalities
Aeroplanes	2001-2010 (average per year)	20.9	4.1	7.6	0
	2011	39	6	6	0
	2012	31	3	8	0
Helicopters	2001-2010 (average per year)	27.2	4.4	7.6	1.4
	2011	37	11	26	0
	2012	30	8	12	0

Figure 25: Fatal Accidents by Aircraft Category and Operation Type in Aerial Work, All Mass Categories, 2003 – 2012

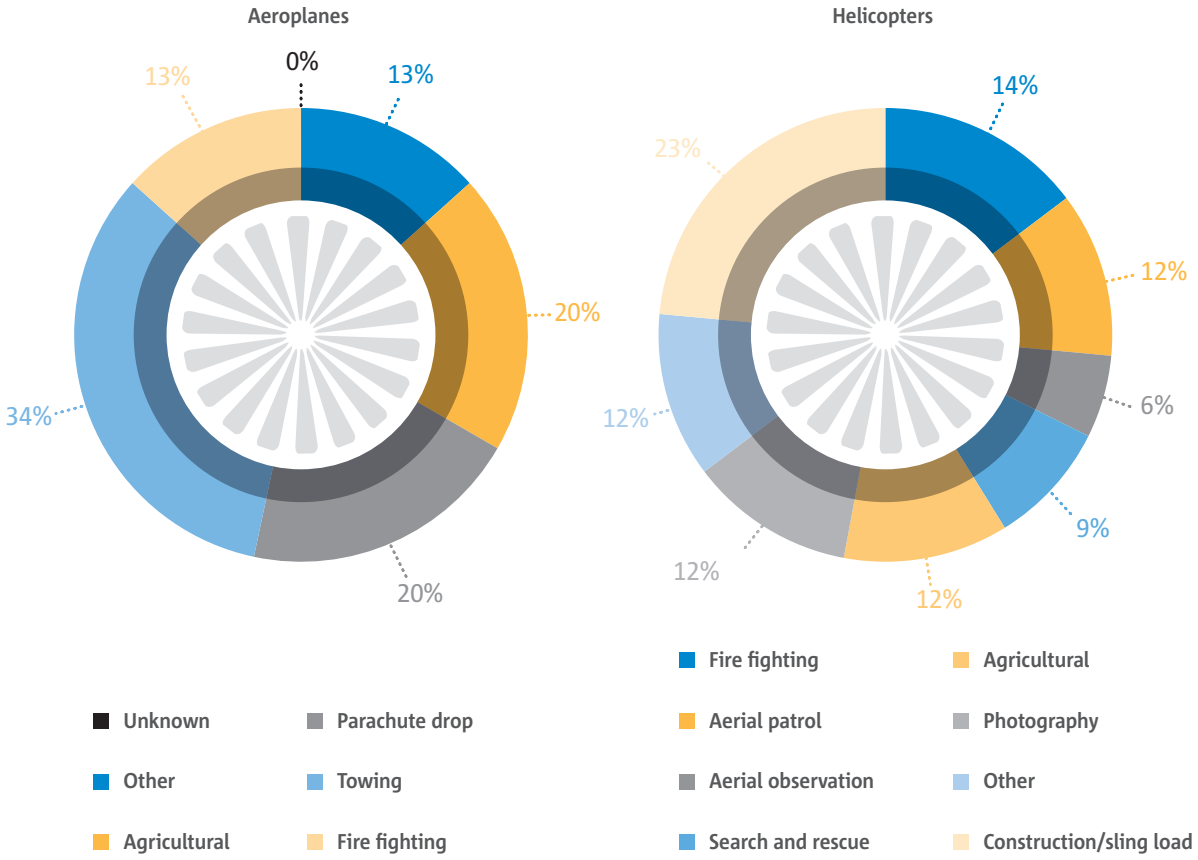


Figure 25 shows the distribution of fatal accidents by operation type between aeroplanes and helicopters for the decade 2003 to 2012.

Accident Categories

In order to assist in the identification of particular safety issues, one or multiple occurrence categories were assigned to accidents involving aeroplanes and helicopters conducting Aerial Work. This was done using the CICTT occurrence categories, which are listed in Appendix 1.

Figure 26: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered Aerial Work Aeroplanes, 2003-2012

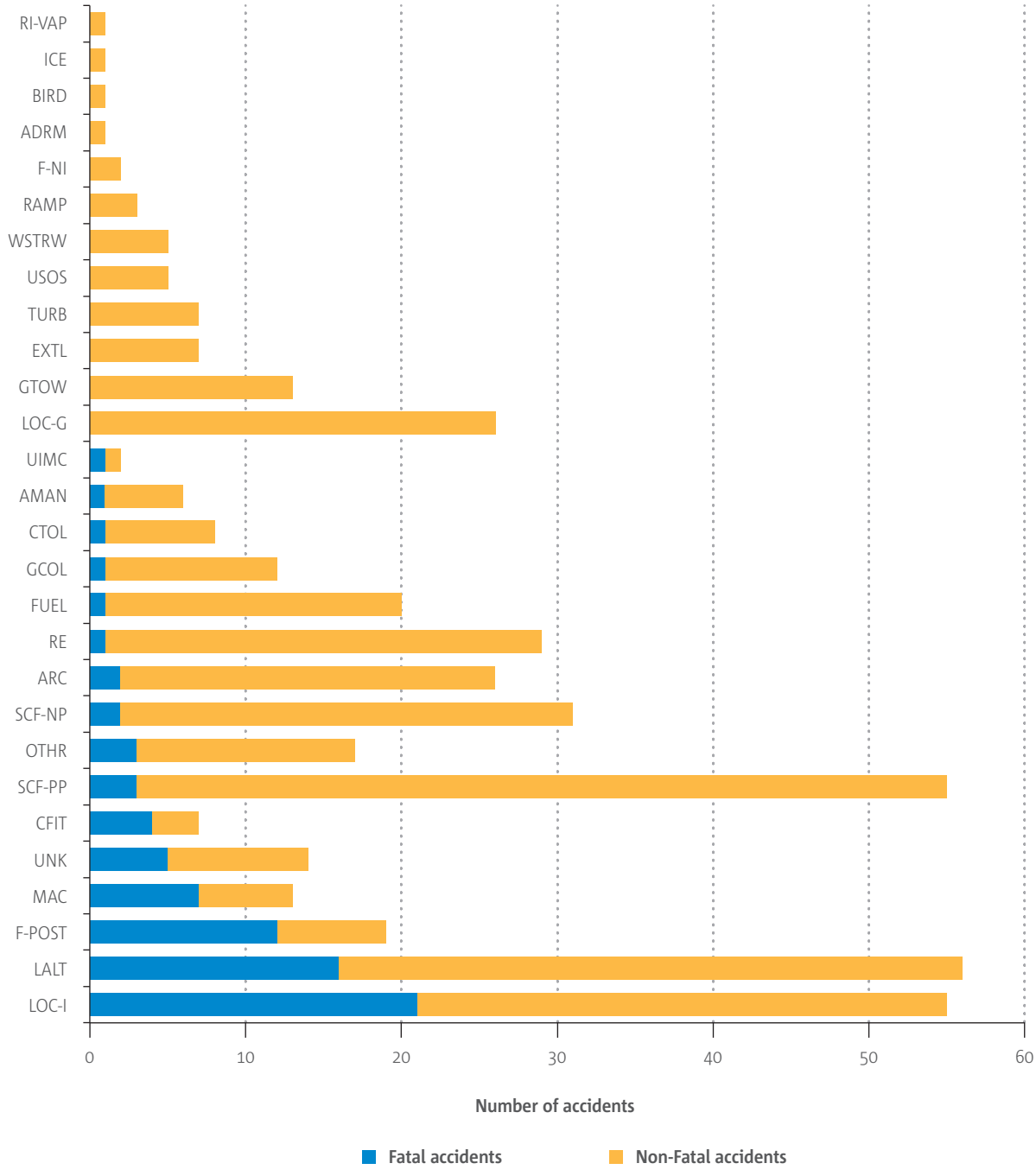
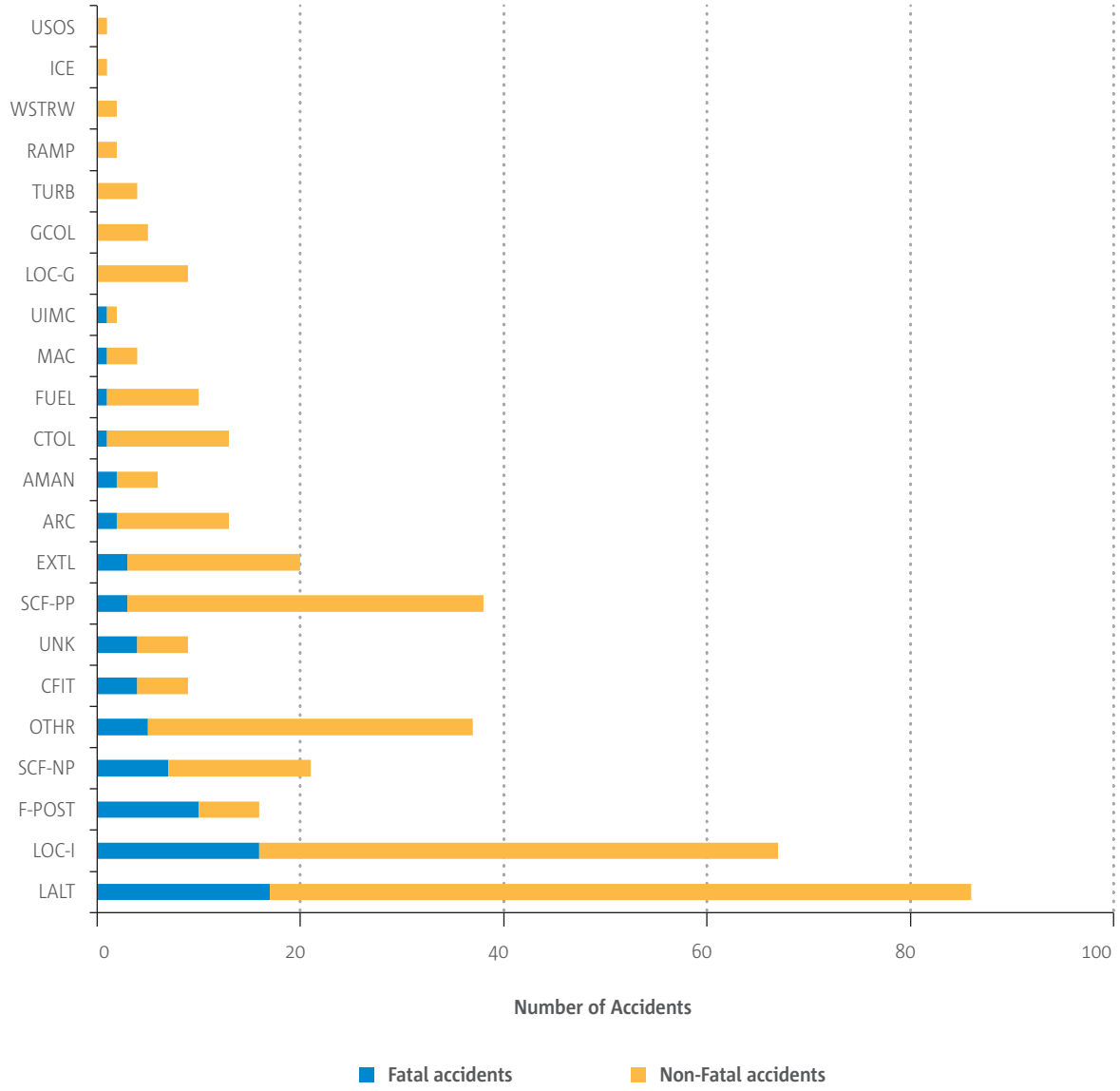


Figure 26 describes typical aeroplane accidents in Aerial Work. 'Loss of Control – In-Flight' (LOC-I) is the category with the highest number of fatal accidents, followed by 'Fire – Post Impact' (F-POST) and 'Unknown' (UNK). Accidents involving aeroplanes flying intentionally low, close to the ground (coded under LALT) represent the third highest number of fatal accidents.

Fewer accidents have occurred involving helicopters in Aerial Work, in comparison to aeroplanes. This is also a reflection of the smaller fleet size of helicopters registered in EASA MS.

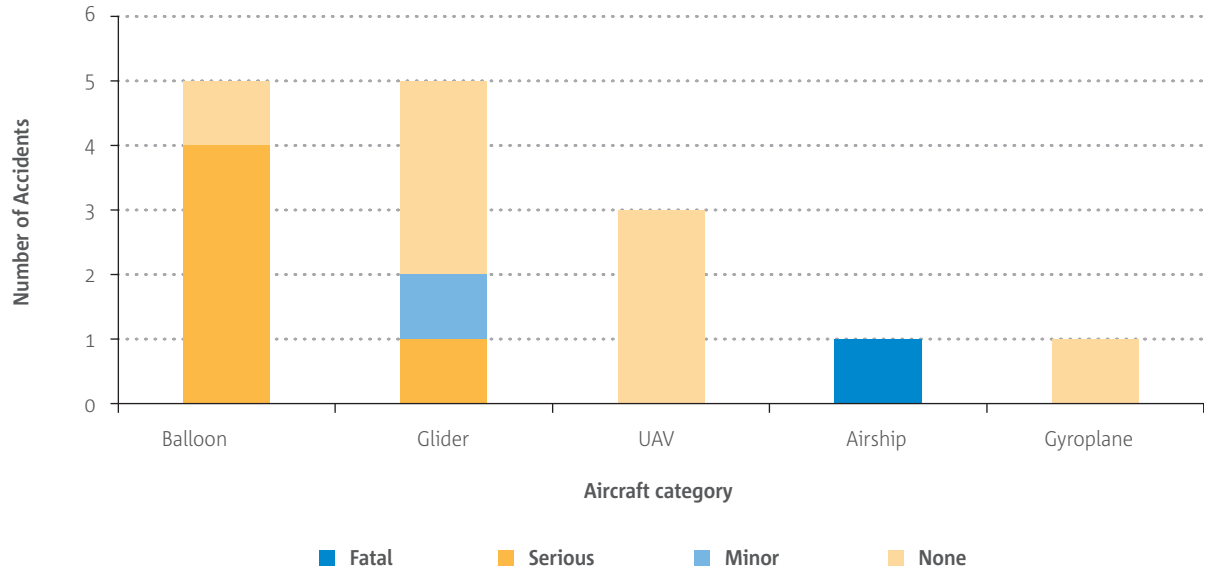
Figure 27: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered Aerial Work Helicopters, 2003-2012



Other Aircraft Types

During the past 10 years, accidents have also occurred in Aerial Work operations with aircraft other than Aeroplanes or Helicopters. As shown in Figure 28, a total of 15 such accidents have occurred, of which Balloons (5), Gliders (5) are the most affected aircraft categories.

Figure 28: Aerial Work Accidents by Aircraft Category and Injury Level, Involving Aircraft other than Aeroplanes or Helicopters, EASA MS State Registered, 2003-2012



6 General Aviation

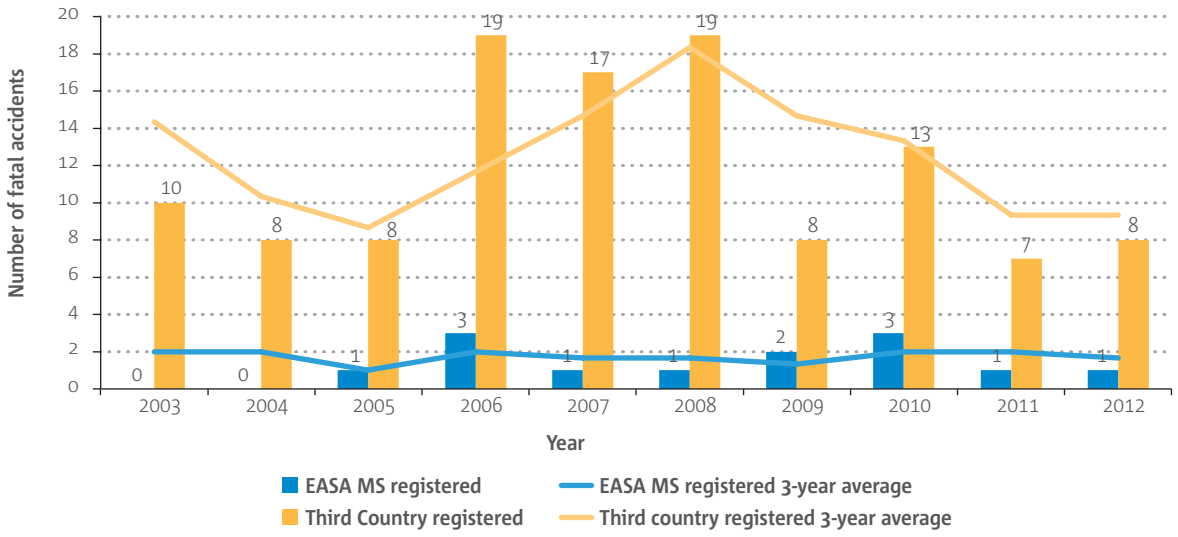
Introduction

This chapter discusses accidents which involved aircraft of all mass categories in General Aviation operations. General Aviation means all civil aviation operations other than Commercial Air Transport or an Aerial Work operation. The aircraft are identified using the state of registry of the aircraft and categorised as either an EASA MS registered aircraft or third-country registered aircraft.

Business Aviation Accidents

Business Aviation is considered a subset of General Aviation operations. The data on Business Aviation are presented in this document in light of the increasing importance of this sector. The number of accidents per year involving EASA MS registered business flights has ranged between 1 and 3, an average of 1.3 per year.

Figure 29: Number of Fatal Accidents in EASA MS and Third Country Registered Business Aviation Aeroplanes, 2003-2012



General Aviation Accidents Above 2,250 kg MTOM

This section reviews accidents involving General Aviation aircraft with a MTOM above 2,250 kg. Although all aircraft types are included in the analysis, the accidents only involved aeroplanes and helicopters, therefore there are no figures presented for other aircraft categories.

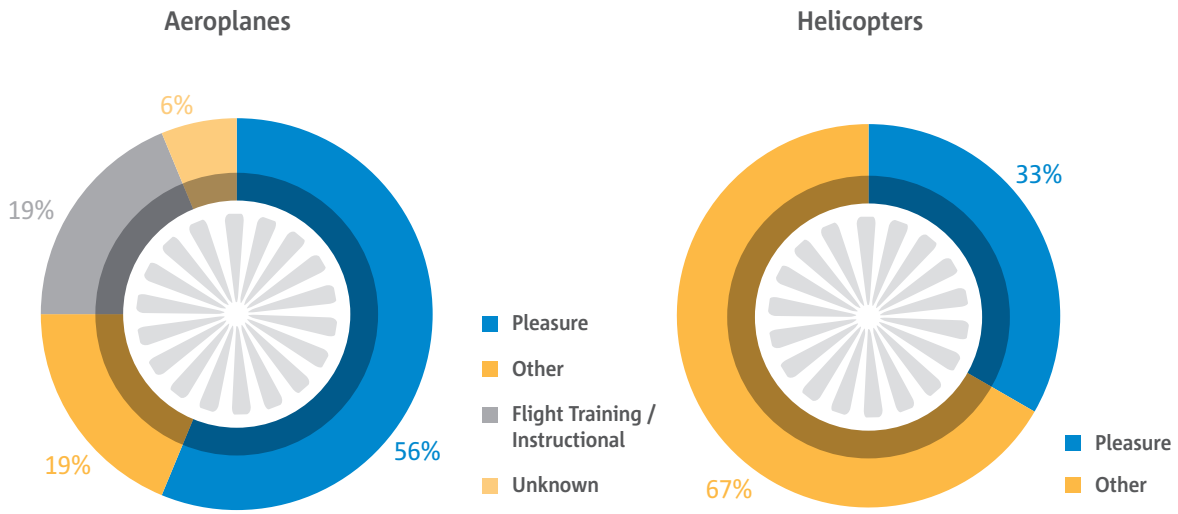
In Table 4 the time period presented extends from 2001 – 2012, showing the number of accidents in 2011 and 2012 as well as the average for the decade preceding these years.

Table 4: Overview of Number of Accidents, Fatal Accidents and Fatalities by Aircraft Category and Operation Type, all EASA MS Registered General Aviation Aircraft Above 2,250 kg MTOM.

Aircraft category	Period	Number of all accidents	Fatal accidents	Fatalities on board	Ground fatalities
Aeroplanes	2001-2010(average per year)	9.7	3.1	8.1	0
	2011	14	3	8	0
	2012	8	1	2	0
Helicopters	2001-2010(average per year)	2.6	0.7	3.1	0
	2011	5	3	8	0
	2012	3	1	5	0

Figure 30 shows the distribution of fatal accidents by aircraft category and operation type for the period 2008-2012.

Figure 30: Proportion of Fatal Accidents by Aircraft Category and Operation Type, in General Aviation Aircraft Above 2,250 kg MTOM 2008 – 2012

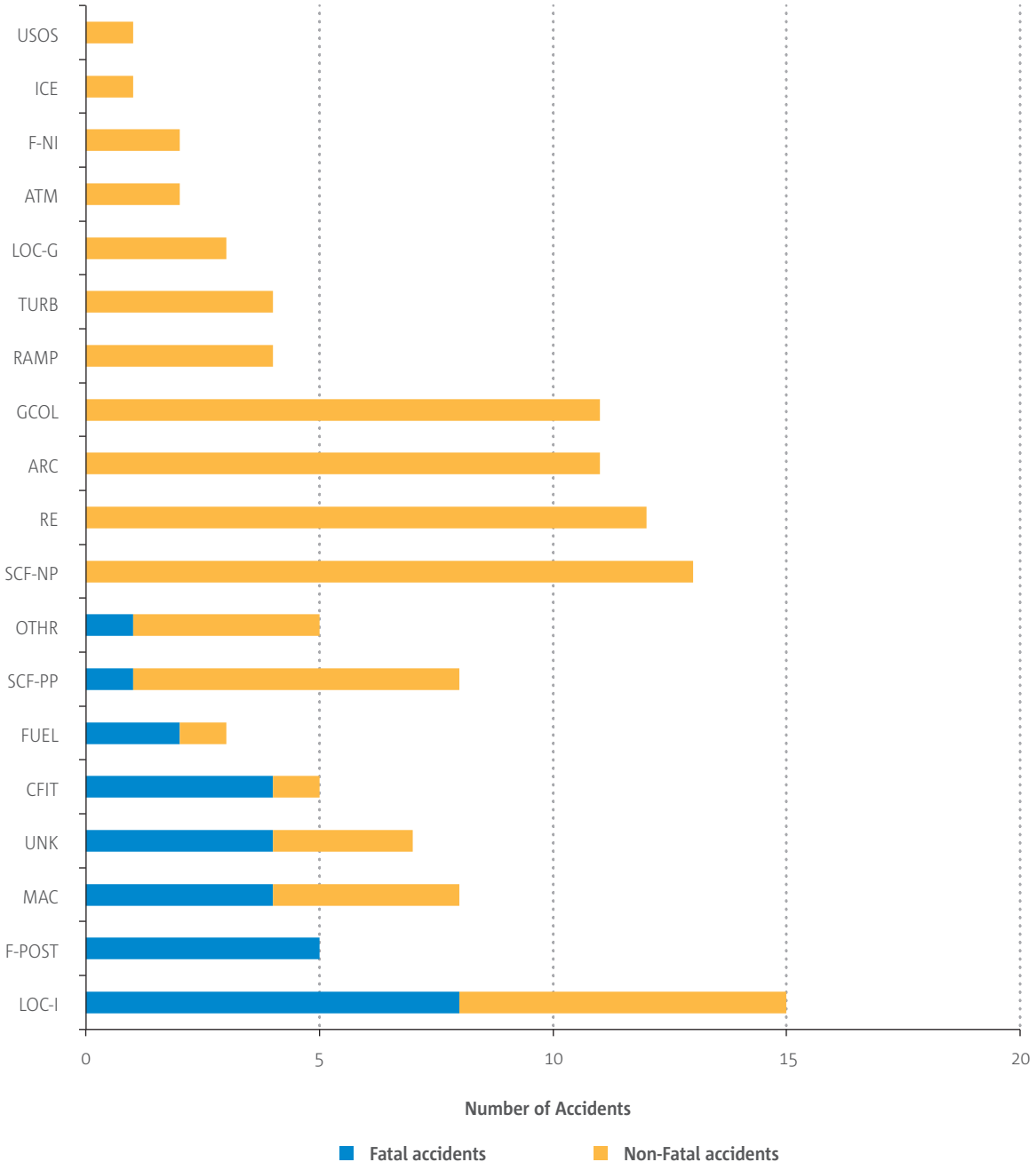


Accident Categories

In order to assist in the identification of particular safety issues, one or multiple occurrence categories were assigned to aeroplane and helicopter accidents involving EASA MS General Aviation operations. This was done using the CICTT occurrence categories, which are listed in Appendix 1.

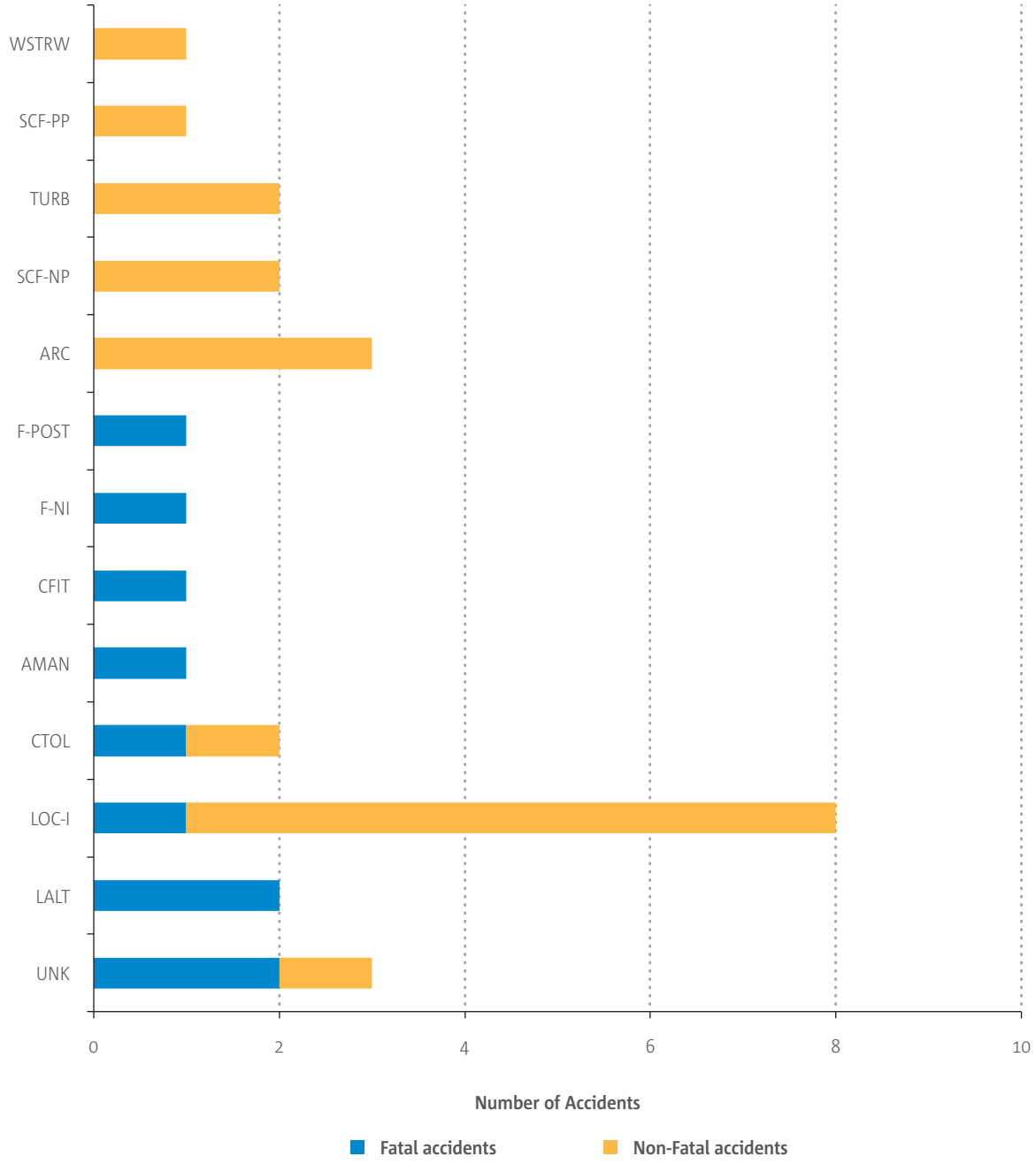
Figure 31 shows that 'Loss of Control – In-Flight' (LOC-I) is the category with the highest number of fatal accidents. The investigation in several of these accidents was not able to determine all the causes which led to the loss of control. There are several fatal accidents with the occurrence category 'Unknown' (UNK) , indicating that there was insufficient data to permit classification of these accidents. Abnormal Runway Contact (ARC) often precedes a Runway Excursion (RE): both accident categories have high numbers of non-fatal accidents.

Figure 31: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered General Aviation Aeroplanes above 2,250 kg MTOM, 2008-2012



Fewer accidents have occurred involving helicopters in General Aviation in comparison to aeroplanes. This is also a reflection of the smaller fleet size of helicopters registered in EASA MS.

Figure 32: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered General Aviation Helicopters above 2,250 kg MTOM, 2008-2012



General Aviation Accidents Below 2,250 kg MTOM

Data for accidents involving aircraft not exceeding 2,250 kg MTOM was provided to EASA by the EASA MS. As in previous years, the level of reporting and the quality of the reports differs by EASA MS. Some States showed an improvement in the quality and completeness of the data and all except one of the EASA MS provided the data in an ECCAIRS. For the year 2012, one State; Liechtenstein reported zero accidents in their territory. Together, France, Germany and the UK reported 66% of all the accidents in 2012. It should be noted that the actual number of accidents may differ, as some recent accidents are possibly missing from the database while their investigation continues. Moreover, completed investigations have been added to previous years which mean that historical data is likely to be slightly different from previous Annual Safety Reviews.

Table 5 presents the number of accidents, fatal accidents and fatalities in 2012 and compares them with the average for the previous period (2007 – 2011). The total number of accidents decreased in 2012 when compared with the average of the previous years; globally the number of fatal accidents and fatalities on board also decreased. The decrease in fatal accidents and fatalities can mainly be seen in fewer aeroplane and helicopter accidents in spite of increase in fatal glider accidents.

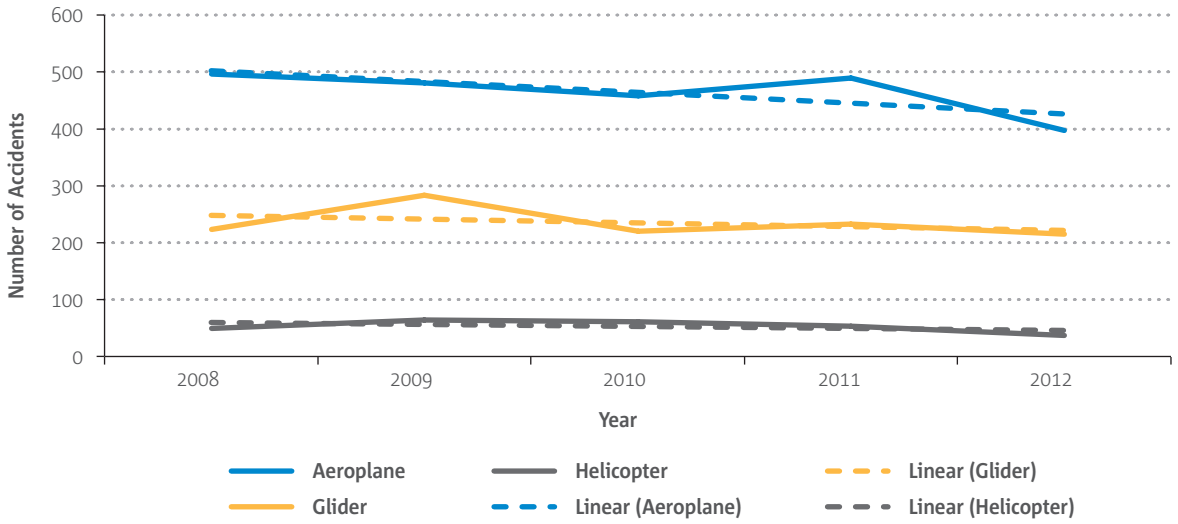
Table 5: Overview of Number of Accidents, Fatal Accidents and Fatalities by Aircraft Category And Operation Type all EASA MS Registered General Aviation Aircraft Below 2,250 kg MTOM

Aircraft category	Period	Total number of accidents	Number of fatal accidents	Number of fatalities on board	Number of ground fatalities
Balloons	2007-2011(average per year)	11.0	0.4	0.6	0
	2012	12	1	3	0
Dirigibles	2007-2011(average per year)	0	0	0	0
	2012	0	0	0	0
Aeroplanes	2007-2011(average per year)	486.2	61.8	121.0	1.2
	2012	397	51	108	0
Gliders	2007-2011(average per year)	238.8	28.6	36	0.2
	2012	215	30	33	0
Gyroplanes	2007-2011(average per year)	15.4	4.2	5.0	0.2
	2012	19	4	6	0
Helicopters	2007-2011(average per year)	56.2	8.2	18.0	0.6
	2012	37	6	15	1
Microlights	2007-2011(average per year)	222.2	38.0	55.4	0.2
	2012	219	39	59	0

Aircraft category	Period	Total number of accidents	Number of fatal accidents	Number of fatalities on board	Number of ground fatalities
Other	2007-2011(average per year)	4.8	2.6	3.0	0
	2012	14	1	1	0
Motorgliders	2007-2011(average per year)	1.0	0	0	0
	2012	5	1	1	0
Average Total	**2007-2011**	**1035.6**	**143.8**	**239.0**	**2.4**
Total	**2012**	**918**	**133**	**226**	**1**
Change (%)	**2012 over previous**	**-11%**	**-8%**	**-5%**	**-58%**

Figure 33 shows that that the number of fatal accidents in EASA MS of aircraft with MTOM below 2,250 kg has an overall slightly decreasing trend for the most common aircraft categories (Aeroplanes, Helicopters and Gliders), as shown in Figure 33.

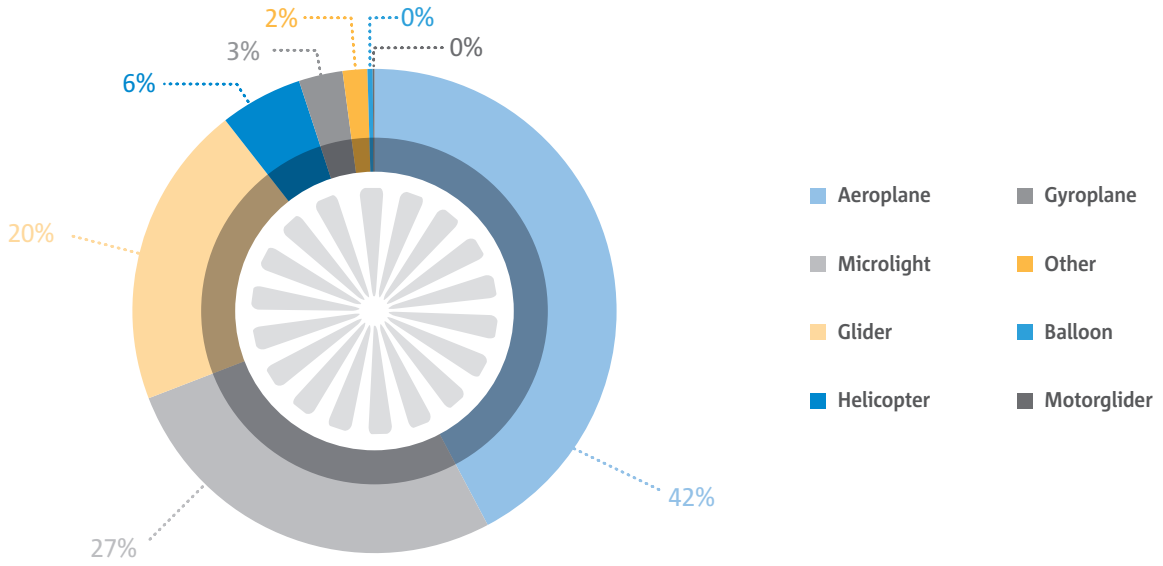
Figure 33: Number of Accidents per year, by Aircraft Category involving General Aviation Aircraft Below 2,250 kg MTOM 2008-2012



Fatal Accidents

Figure 34 shows the distribution of fatal accidents by aircraft category. The majority (42 %) of light aircraft involved in fatal accidents between 2008 and 2012 were aeroplanes. Microlight aircraft were involved in 27%, followed by gliders with 20%.

Figure 34: Proportion of Fatal Accidents by Aircraft Category, Involving EASA MS General Aviation Aircraft Below 2,250 kg, 2008 – 2012



Accident Categories

In order to assist in the identification of particular safety issues, one or multiple occurrence categories were assigned to accidents involving light aircraft. This was done using the CICTT occurrence categories, which are listed in Appendix 1.

The occurrence categories had been, historically, developed to permit the tracing of the safety efforts for fixed wing air transport operations. Additional categories, more appropriate for General Aviation operation and adequate for light aircraft, rotary wing and gliders, were recently introduced and are used in this Review.

These are Collision during Take-off or Landing (CTOL), Glider Towing Related Events (GTOW), Loss of Lifting Conditions En Route (LOLI) and Unintended Flight in Instrument Meteorological Conditions (UIMC). In most cases the new categories were not applied to records before 2010. As a result, the analysis may suffer from the non-uniform coding of occurrences although an effort was made to amend records where the codes were clearly missing.

In previous editions of the Annual Safety Review (ASR) a general figure for all aircraft categories was presented. This figure is retained for comparison purposes, however it is recognised that the accident categories are more correctly represented if separated by the aircraft category (e.g. aeroplanes, helicopters and gliders).

Note that following graphs show the total number of accidents where in the previous ASR these graphs were represented as average number of accidents per year.

Figure 35: Occurrence Categories for Fatal and Non-Fatal Accidents - EASA MS Registered General Aviation Aircraft Below 2,250 kg MTOM, 2008-2012

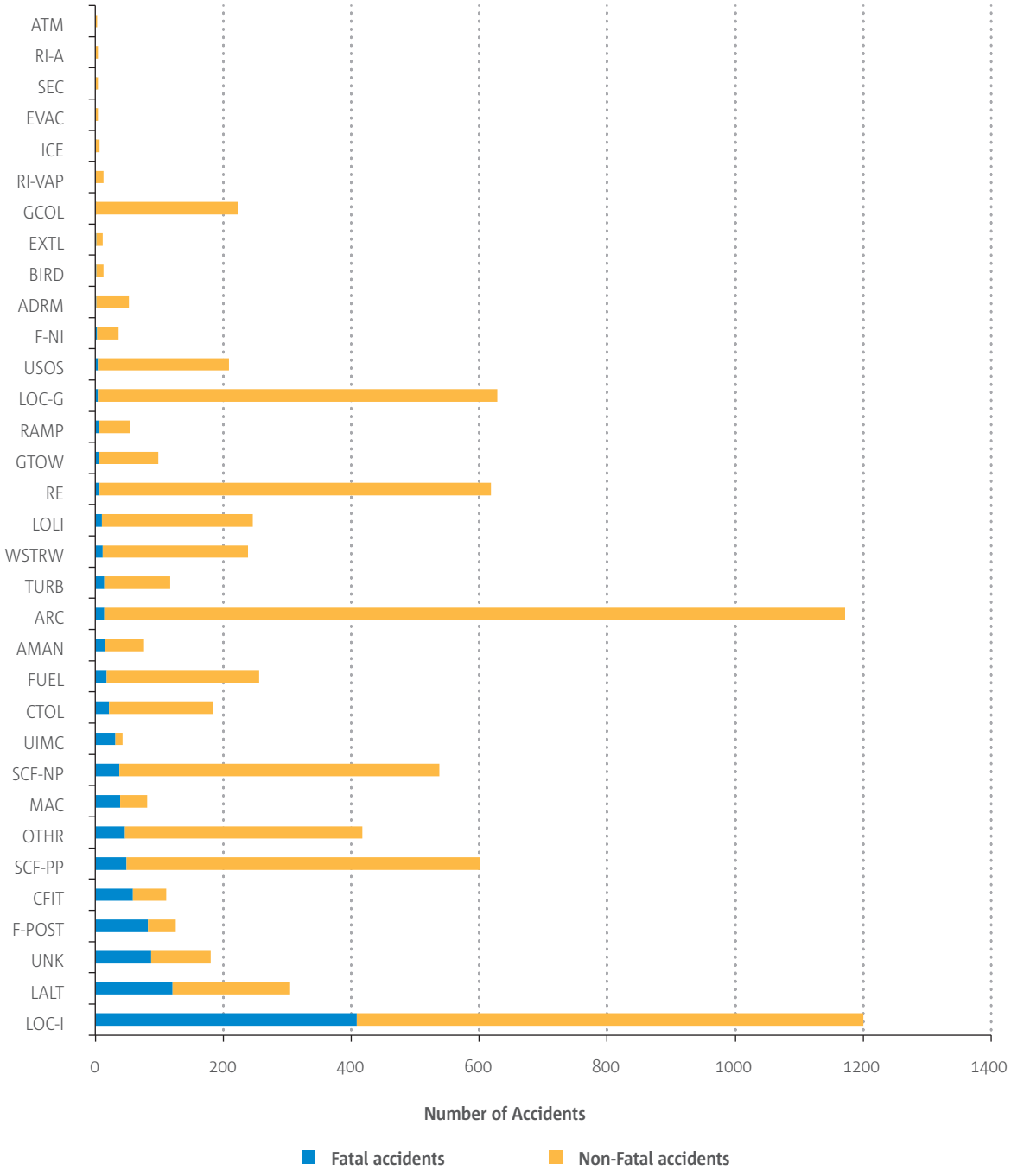


Figure 36: Occurrence Categories for Fatal and Non-Fatal Accidents - EASA MS Registered General Aviation Aeroplanes Below 2,250 kg MTOM, 2008-2012

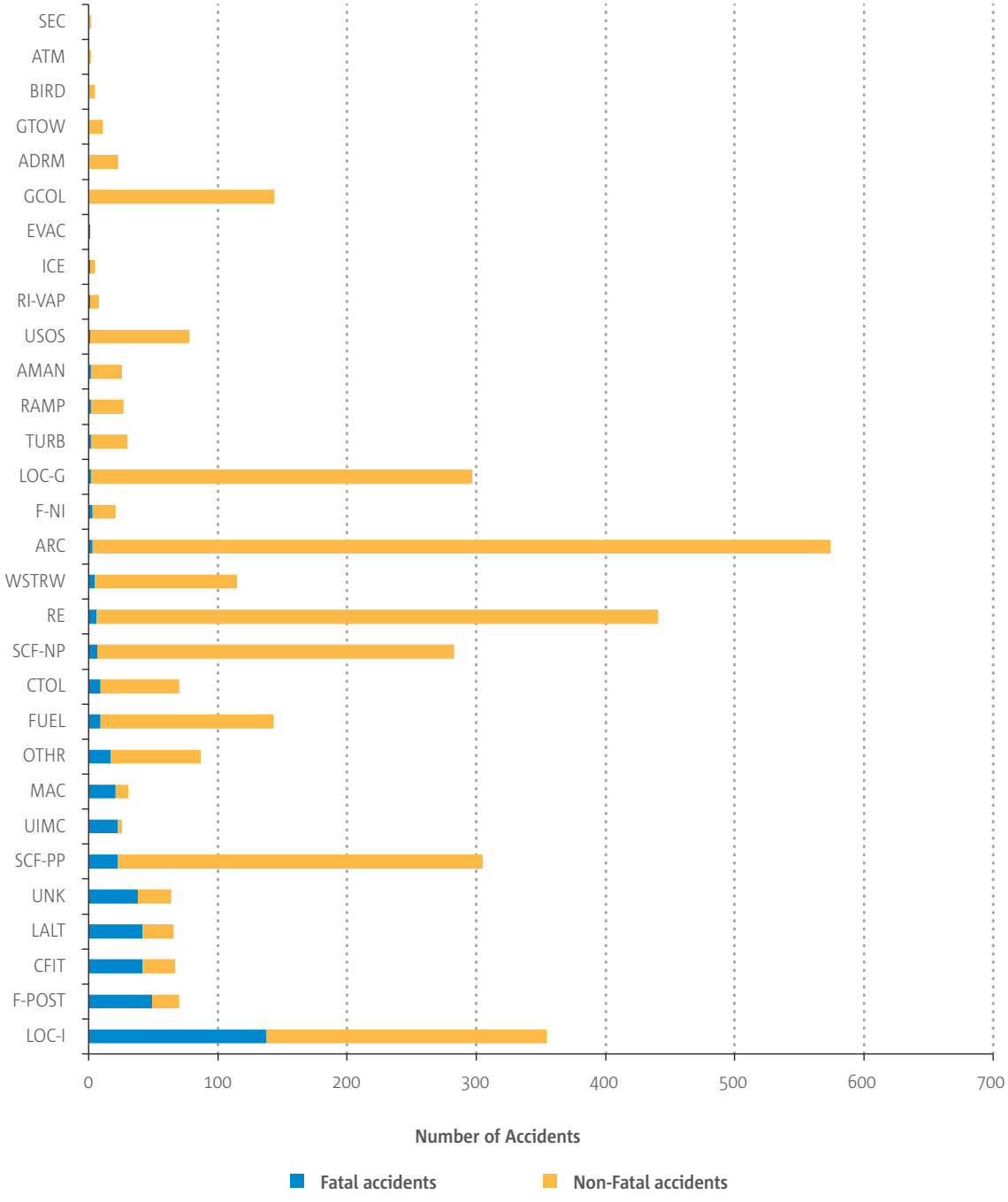


Figure 36 shows that the category assigned most frequently to fatal accidents involving aeroplanes was Loss of Control - In Flight (LOC-I). This is followed by Fire/Smoke - Post-Impact (F-POST), Controlled Flight Into Terrain (CFIT) and Low Altitude Operations (LALT) and which may have been assigned together with LOC-I. The figure also shows that there is a high number of fatal accidents involving Unintended Flight in IMC (UIMC). As this is one of the new categories and not used before 2010, the value in the graph understates its importance.

Figure 37: Occurrence Categories for Fatal and Non-Fatal Accidents - EASA MS Registered General Aviation Helicopters Below 2,250 kg MTOM, 2008-2012

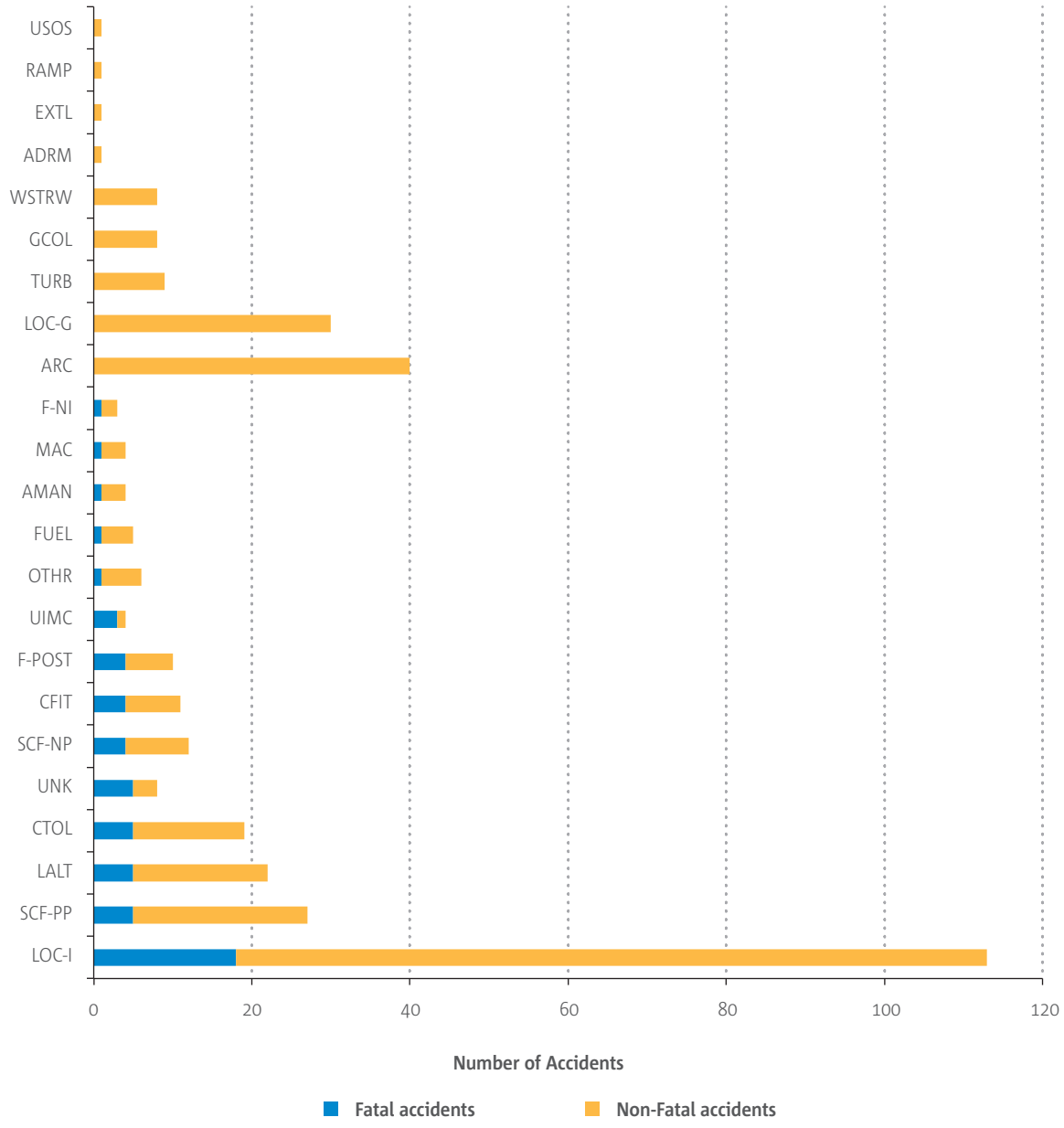


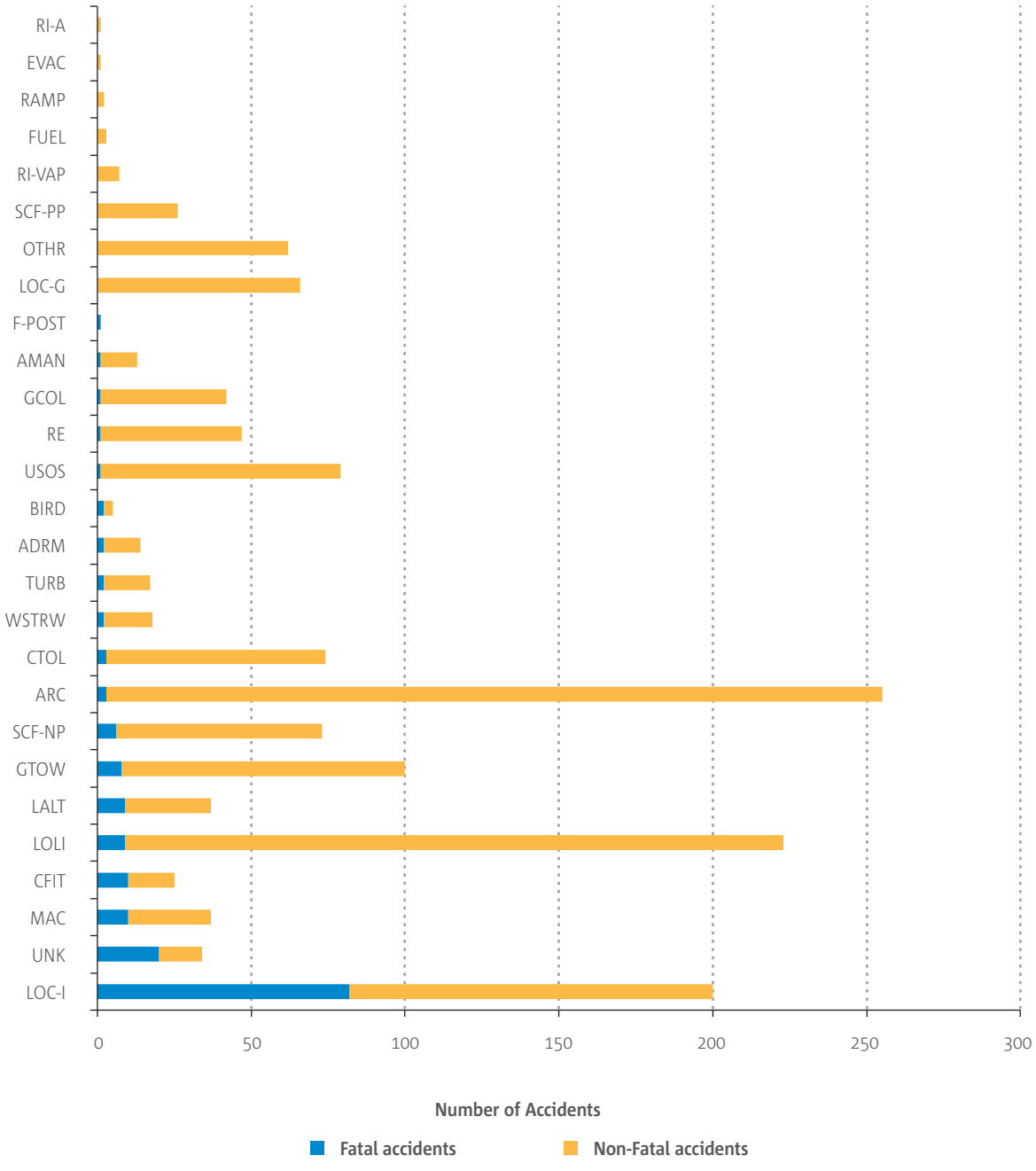
Figure 37 shows that for helicopters LOC-I is the most important category, in terms of fatal accidents but also as the most frequent one for non-fatal accidents. The second most important is SCF-PP and third is the LALT.

Figure 38 shows the occurrence categories for the aircraft category Glider. LOC-I is the most important category also for gliders, having the highest number of fatal accidents assigned.

To be noted is the high incidence of 'Mid-Air Proximity or Collisions' (MAC) for gliders compared to helicopters and aeroplanes. This may, in part, be explained by the fact that in many cases several gliders share the same area in the air, but may have difficulty in communicating with each other or being seen.

As in previous years, exposure data for light aircraft continues to be unavailable. The number of hours flown by light aeroplanes and helicopters is not recorded by the National Aviation Authorities in the great majority of the EASA MS. Operating hours regarding gliders, balloons and aircraft such as homebuilt are also not recorded, or are, in several EASA MS, entrusted to associative organisations and not retrieved by the Authorities. Exposure Data for microlight (including microlight aeroplanes, helicopters, gyroplanes and gliders) and for "Others" are usually entrusted to the aircraft owner, who very seldom records or provides it. An accurate estimate of flight hours or movements is needed to allow a meaningful analysis of data and provide a measure of the safety status.

Figure 38: Occurrence Categories for Fatal and Non-Fatal Accidents - EASA MS Registered General Aviation Gliders Below 2,250 kg MTOM, 2008-2012



7 Aerodromes

Introduction

This chapter examines accidents and serious incidents at aerodromes in EASA Member States (MS). The nature of the aviation system means that many events occur at or near an aerodrome without the aerodrome being involved. This chapter examines accidents and serious incidents that relate to the aerodrome itself or are related to a service supplied at an aerodrome. Note that data relating to Runway Incursions are presented in Chapter 8 – Air Traffic Management. The time period covered in this chapter is 2008-2012.

The aerodromes included in this chapter are those which will in due course fall within the scope of EASA rules. Applicable aerodromes are those which have all of the following criteria:

- open to public use,
- serve commercial air transport,
- provide instrument approach or departure procedures,
- have a paved runway of 800 metres or above or exclusively serve helicopters.

Aerodrome Accidents and Serious Incidents

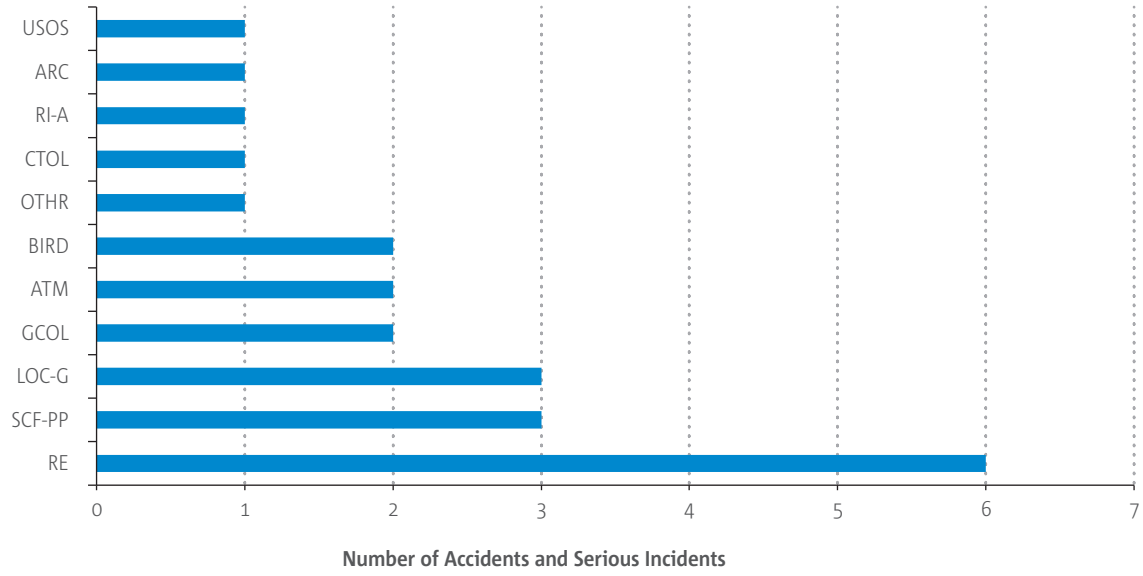
Aerodrome accidents and serious incidents are defined as those which involve aerodrome design or functionality issues associated with: runways, taxiways, ramp areas, parking areas, buildings and structures, fire and rescue services, obstacles on the aerodrome, lighting, markings, signage, procedures, policies, and standards. Examples include aerodrome lighting failures, ambiguous or incorrect signage and the effects of aerodrome design.

In the period 2008 – 2012 there were 15 accidents and serious incidents involving aerodromes. In 2012 there were no such accidents or serious incidents. Figure 39 shows the number of accidents and serious incidents per year involving aerodromes. On-going investigations into other accidents and serious incidents, as well as those shown in the graph below, may cause the data to be updated in the future so it should only be considered as preliminary data.

Figure 39: Number of Accidents and Serious Incidents per Year Involving EASA MS Aerodromes Occurrences, 2008-2012

The occurrence categories assigned to aerodrome accidents and serious incidents are shown in Figure 40. It can be seen that Runway Excursion (RE) is the most common occurrence category to be assigned to aerodrome accidents and serious incidents. Note that more than one occurrence category can be assigned to an occurrence. The position of System Component Failure – Power Plant (SCF-PP) in aerodromes occurrences is due to two bird strikes and one case of FOD ingestion, all causing engine failures. Whether or not the engine was designed to withstand the magnitude of the bird strike or FOD ingestion is not always clear from initial occurrence reports, so all engine failures have the SCF-PP code applied.

Figure 40: Occurrence Categories Assigned Alongside the Aerodrome Occurrence Category, Involving EASA Aerodromes Accidents and Serious Incidents, 2008-2012

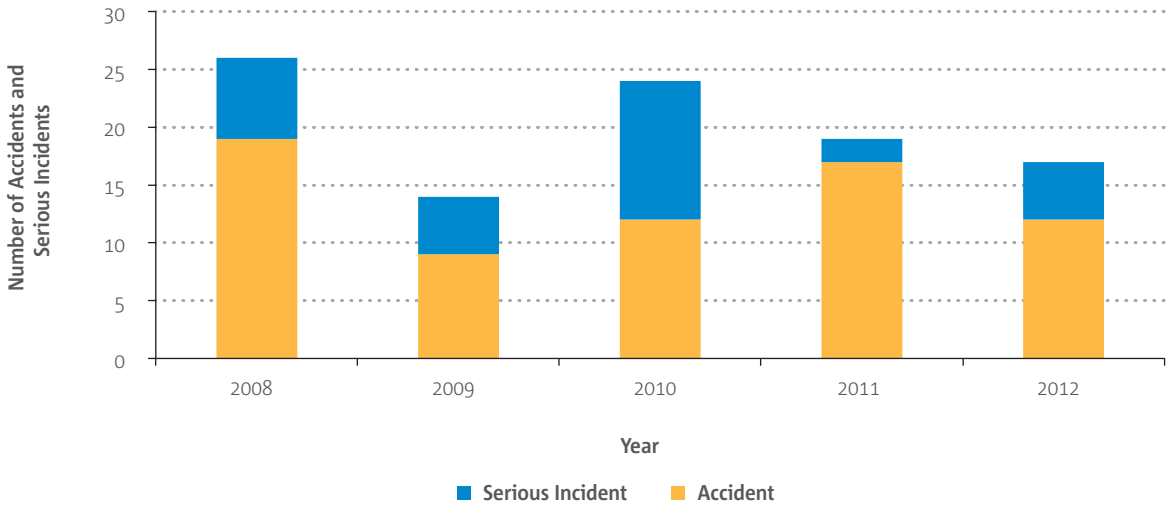


Runway Excursions

Runway Excursions are defined as when an aircraft veers off the side or overruns the end of the runway surface during take-off or landing. The European Aviation Safety Plan (EASp) identifies runway excursions as one of its five operational safety risks for Commercial Air Transport (CAT) aircraft. The issue relates to both aircraft operations, air traffic control and aerodromes. Figures for runway excursions involving CAT aeroplanes are shown in Chapter 4, figures for runway excursions at EASA MS aerodromes are shown here.

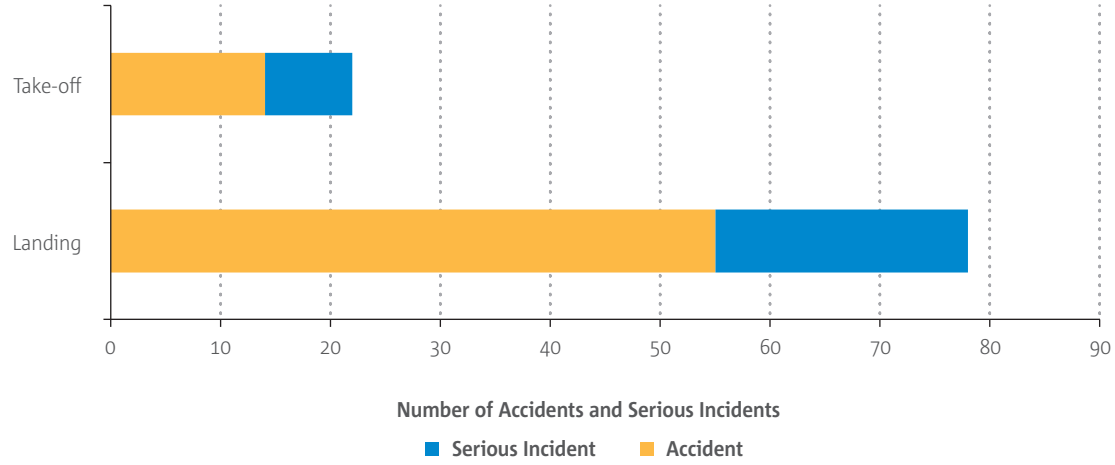
In total there were 100 runway excursion accidents and serious incidents at EASA aerodromes between 2008 and 2012. 17 of these occurred in 2012. Figure 41 shows the total number of runway excursions per year, broken down by occurrence class. Note that unlike Figure 40, the figure below includes Runway Excursions where the Aerodrome occurrence category has not been assigned, in other words the Runway Excursion did not relate to the aerodrome but more likely to factors involving aircraft operation or air traffic control.

Figure 41: Number of Runway Excursion Accidents and Serious Incidents per Year at EASA Aerodromes, 2008-2012



78% of runway excursion accidents and serious incidents occurred during landing and 22% during take-off. Figure 42 shows the number of take-off and landing accidents and serious incidents.

Figure 42: Number of Runway Excursions at EASA Aerodromes By Phase of Flight, 2008-2012

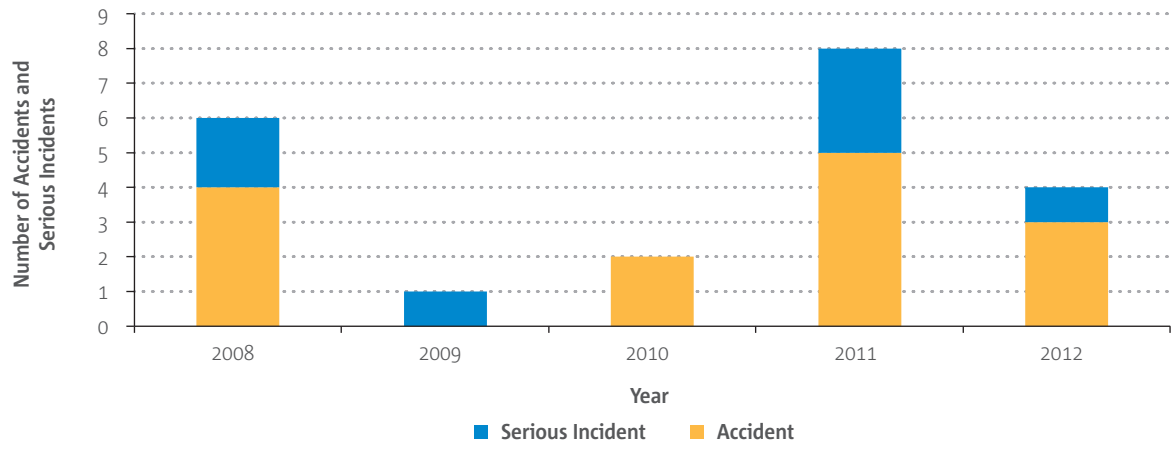


Ground Collisions

Ground Collisions (GCOL) are defined as collisions between an aircraft and another aircraft, vehicle, person or object during taxi. The EASp identifies ground collisions as another of its five operational safety risks for commercial air transport aircraft. The number of ground collisions per year at EASA MS aerodromes is shown in Figure 43. Figures for ground collisions involving CAT aeroplanes are shown in Chapter 4, figures for ground collisions at EASA MS aerodromes are shown here.

In total there were 21 ground collision accidents and serious incidents at EASA MS aerodromes between 2008 and 2012. 4 of these occurred in 2012.

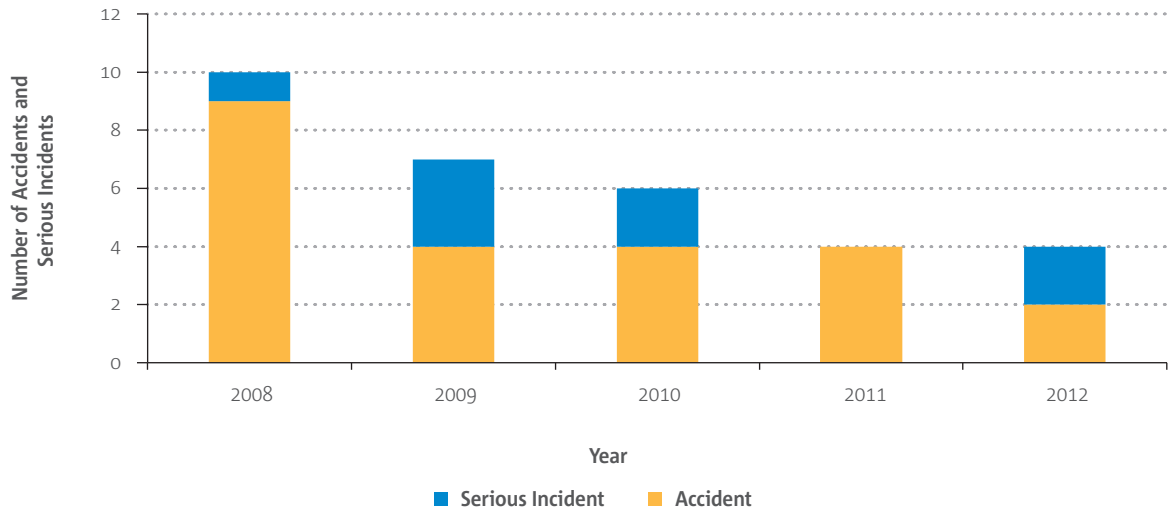
Figure 43: Number of Ground Collision Accidents and Serious Incidents per Year at EASA MS Aerodromes, 2008-2012



Ramp Accidents and Serious Incidents

Ramp events are those that occur during or because of ground handling operations. Examples include loading, pushback, refuelling or de-icing errors and the ramp environment can be considered as distinct from the rest of the aerodrome environment. The number of accidents and serious incidents involving the ramp are shown in Figure 44. The most common types of ramp accident and serious incident involved collisions between aircraft and ground objects, and vehicle/equipment operations. In November 2012, a fatal ramp accident occurred when a baggage loader was killed during the turnround process. This accident has also been included in the CAT aeroplanes chapter.

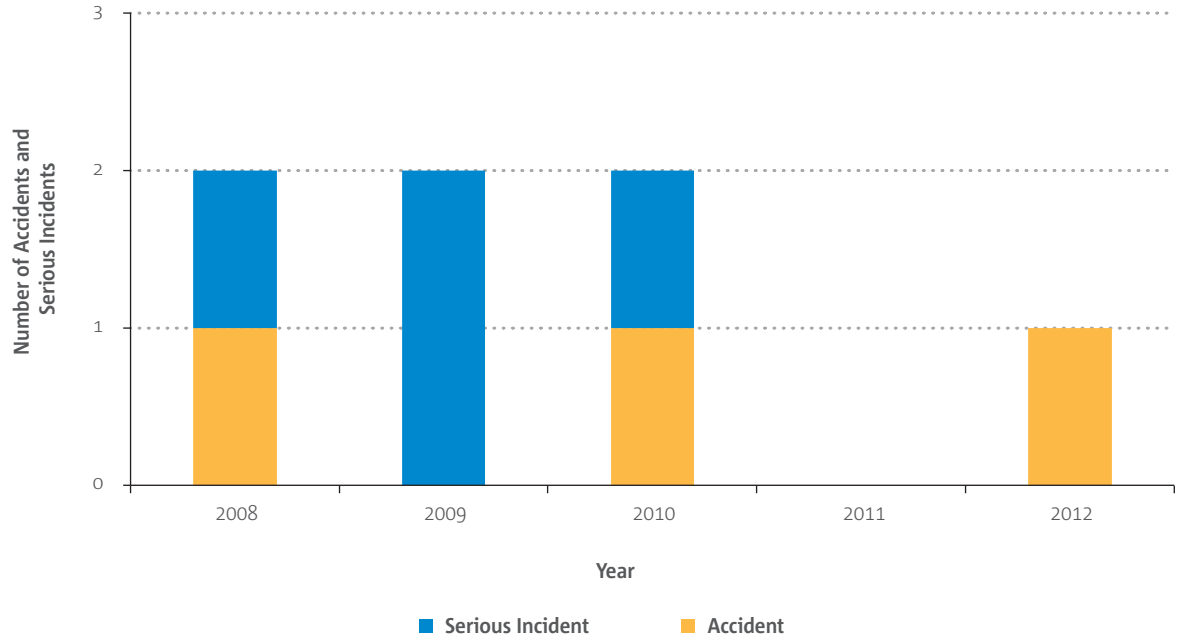
Figure 44: Number of Ramp Accidents and Serious Incidents per Year at EASA Aerodromes, 2008-2012



Bird Strikes

Although bird strikes do not always involve the aerodrome as they cannot be wholly prevented through bird management schemes, they typically occur in the aerodrome environment. The number of accidents and serious incidents involving bird strikes at or near EASA aerodromes is shown in Figure 45.

Figure 45: Number of Bird Strikes per Year by Occurrence Class, 2008-2012



8

Air Traffic Management

Introduction

This Chapter reviews safety data for the European Air Traffic Management (ATM) system, comprising air traffic services, airspace management and air traffic flow control management. The data is provided by Eurocontrol and is collected via the Annual Summary Template (AST) mechanism. The definitions and categories used in this section therefore align with the taxonomy in use for the AST mechanism instead of the CICTT occurrence categories that are used in other parts of the Annual Safety Review.

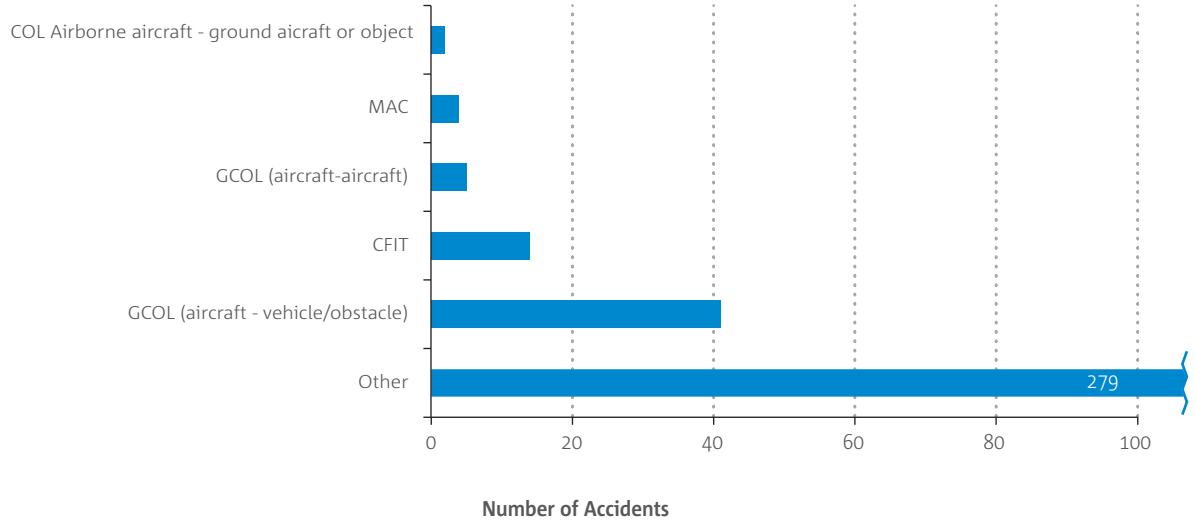
Although the AST mechanism has been in place for a number of years, there was a significant increase in reporting from 2008 onwards. For this reason, where the data is reviewed as a whole, it covers the period 2008-2012, whereas when a time series is shown the data covers the ten-year period 2003-2012. The increase in reporting is observable in the rate of total occurrence reports shown in Figure 50. Note that data for 2012 is preliminary.

The analysis in the ATM chapter includes accidents which occurred within an EASA MS Flight Information Region (FIR) involving at least one aircraft with MTOM of 2250 kg and above; and incidents that occurred within an EASA MS FIR with no MTOM restrictions.

Accidents

There were 345 ATM-related accidents in Europe between 2008 and 2012. The accidents have been categorised by the type of event they involved, as shown in Figure 46. Note that the x-axis for the "other" category has been shortened in order that the detail for the remaining categories is more visible.

Figure 46: Number of ATM-Related Accidents in EASA MS FIRs, 2008-2012

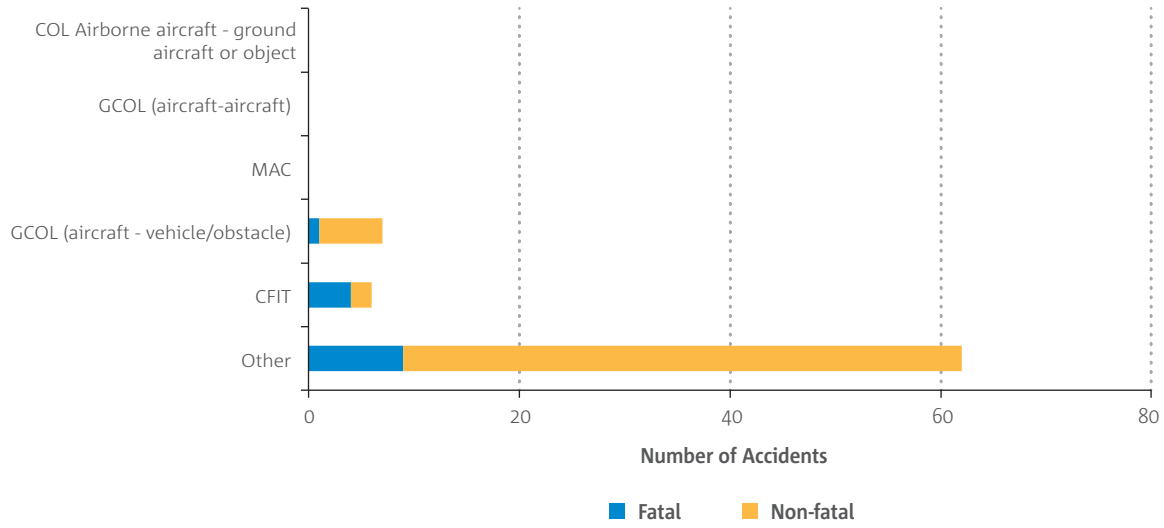


During the course of the investigation process for accidents, the level of ATM contribution is determined. The contribution is then categorised as either direct or indirect, as defined below:

- Direct Contribution – where the ATM event or item was judged to be directly in the causal chain of events,
- Indirect Contribution– where the ATM event potentially increased the level of severity.

In the preliminary 2012 data, 13 accidents (5 fatal and 8 non-fatal) were reported of which 3 were indicated as having a direct ATM contribution, all non-fatal. The distribution of the 13 accidents in terms of their occurrence category is shown in Figure 47.

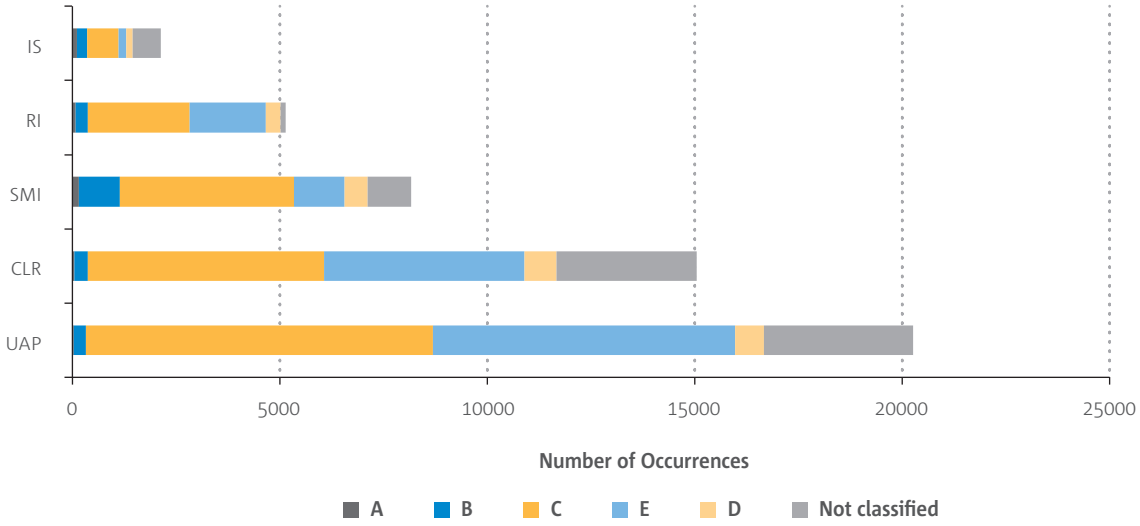
Figure 47: Number of ATM-Contribution Accidents in EASA MS FIRs, 2012



Occurrences

Occurrences are defined as accidents, serious incidents and incidents. The most common types of ATM related occurrence are: Unauthorised Airspace Penetration (UAP), Aircraft Deviation from ATC Clearance (CLR), Separation Minima Infringements (SMI), Runway Incursions (RI) and Inadequate Aircraft Separation (IS). Occurrences can be classified under more than one category, for example a CLR could lead to an SMI. The numbers of these over the period examined are shown in Figure 48, along with the severity classification applied using the Risk Analysis Tool (RAT) methodology. The severity classes are as follows: Serious Incidents (A), Major Incidents (B), Significant (C), No Safety Effect (E), and Not Determined (D).

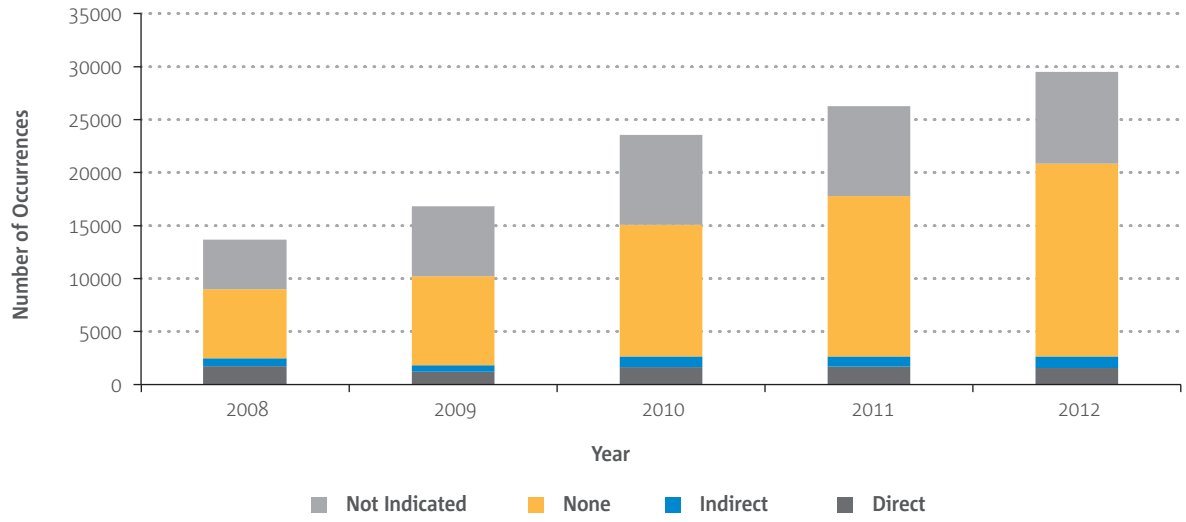
Figure 48: Number of ATM-related Occurrences by Occurrence Category and Severity Grade in EASA MS FIRs, 2008-2012



The number of occurrences per year is shown in Figure 49, which also divides the occurrences by the contribution to the event made by ATM, as reported via the AST mechanism. It can be seen that there has been a steady increase in the number of reported occurrences over the period examined.

The category that has the largest proportion of risk bearing incidents (severity A and B) is SMI. It is to be noted that this category is different from the category of IS where no minimum separation criteria have been defined. Many of the incidents that have resulted in a SMI and categorised as risk bearing are also categorised as CLR or UAP. The incident category RI has the second largest proportion of risk bearing incidents.

Figure 49: Number of ATM-related Occurrences per Year in EASA MS FIRs, 2008-2012



Occurrence Rates

Comparing the number of incidents with the level of traffic can provide meaningful results on the safety trends. The figures in this section show two trends: The rate of incidents reported per million flight hours independent of their severity; and the rate of risk bearing incidents (severity A and B). For the incident category of Runway Incursions a rate per million aircraft movements (departures/arrivals) is being used.

The rate of ATM-related occurrences per year between 2003 and 2012 is shown in Figure 50. The increase in the rate of total occurrence reports from 2008 can be clearly observed. However, the number of severity A and B reports has remained stable over the period.

Figure 50: Rate of ATM-related Occurrences per Year in EASA MS FIRs, 2003-2012

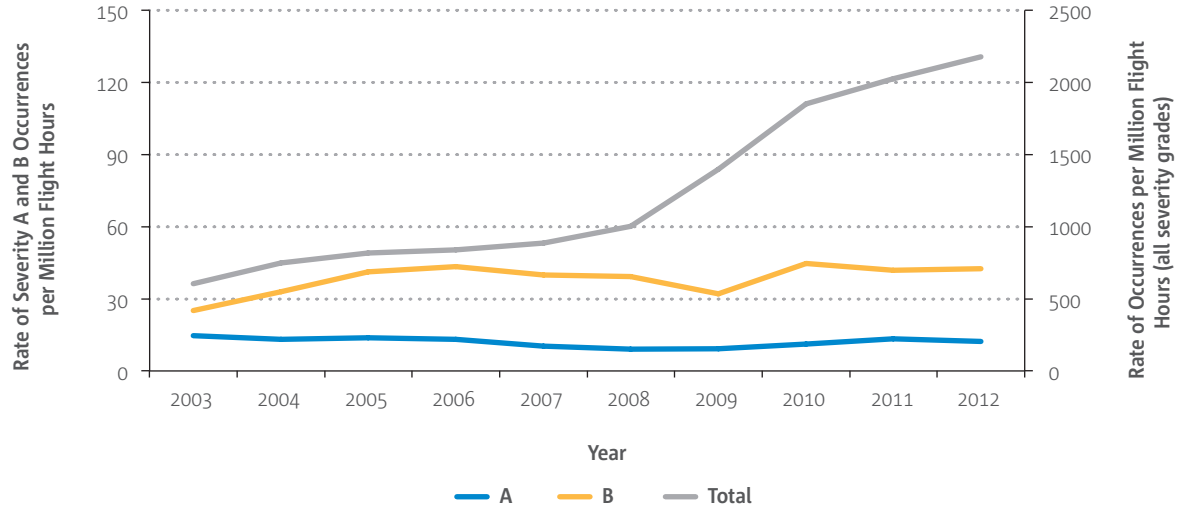


Figure 51 shows the rate of SMIs per million flight hours. For SMIs it is useful to calculate the rate using the number of flight hours, as this best represents the timeframe during which the airspace is actually 'used' by an aircraft.

SMI's refer to occurrences in which defined minimum separation between aircraft, has been lost. Except for 2009 and 2010, the total number of incidents reported in this category has increased every year. Amongst all types of incidents, SMI's typically take the longest time to be investigated, and consequently their number may change in the future.

The SMI's classified as severity A had a decreasing trend until 2010 followed by an increase in 2011. The preliminary data for 2012 indicate a small decrease in severity A occurrences. A similar increase in severity B classified SMI's was indicated in the data for 2011 and continued in 2012 now showing almost an equal level as in 2008.

Figure 51: Rate of Separation Minima Infringements per Million Flight Hours per Year in EASA MS FIRs, 2003-2012

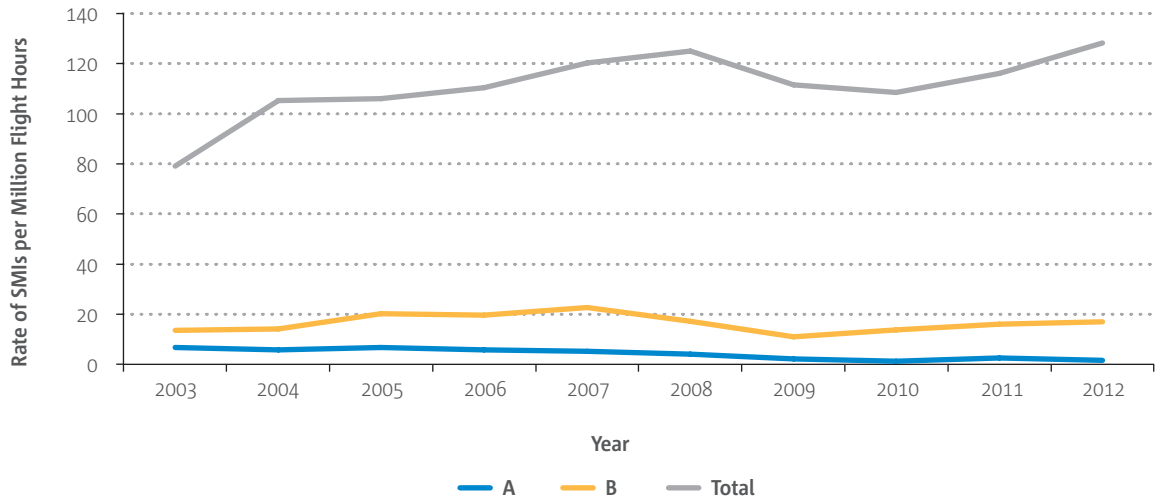


Figure 52 shows the rate of RIs per million flights. For RI it is useful to calculate the rate using the number of movements or flights as this represents the frequency with which a runway is being used. The European Aviation Safety Plan (EASp) identifies RI as one of its five operational safety risks for Commercial Air Transport (CAT) aircraft.

Over the recent years the rate of risk bearing RI has varied. The rate of serious incidents (severity A) in 2011 indicated at almost the same level as in 2010 now shows a decrease for 2012 (based on the preliminary data reported). The rate of major incidents (severity B) decreased until 2009 and where 2010 showed an increase and 2011 indicated a reverse trend, the preliminary 2012 data indicates an increase to the same level as for 2010.

Figure 52: Rate of Runway Incursions per Million Flights in EASA MS FIRs, 2003-2012

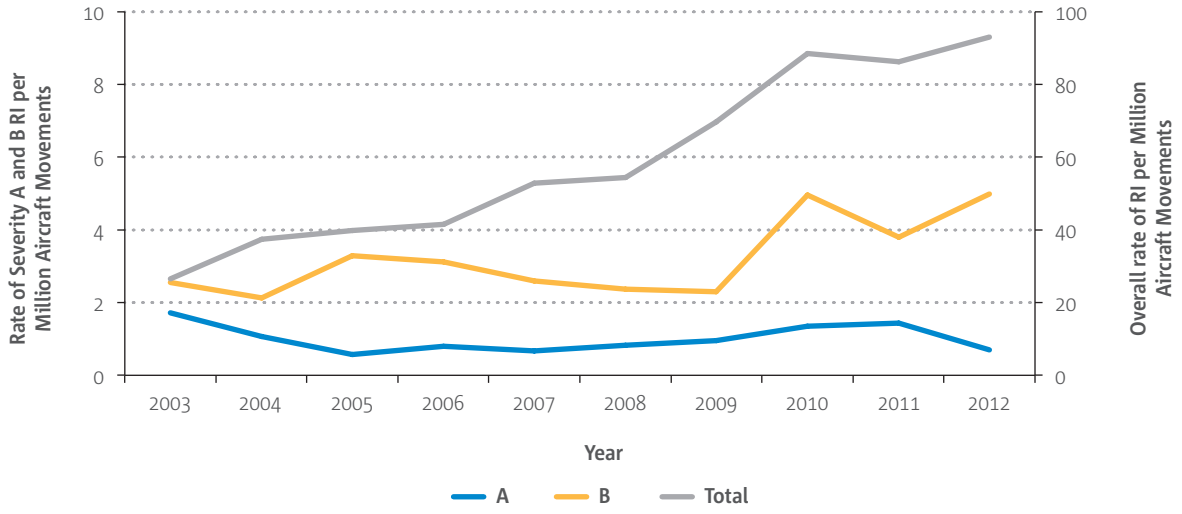


Figure 53 shows the rate of reported UAP for the period 2003-2012 and indicates that the overall reporting rate of this type of incident has risen considerably over the ten year period.

Figure 53: Rate of Unauthorised Airspace Penetration per Million Flight Hours in EASA MS FIRs, 2003-2012

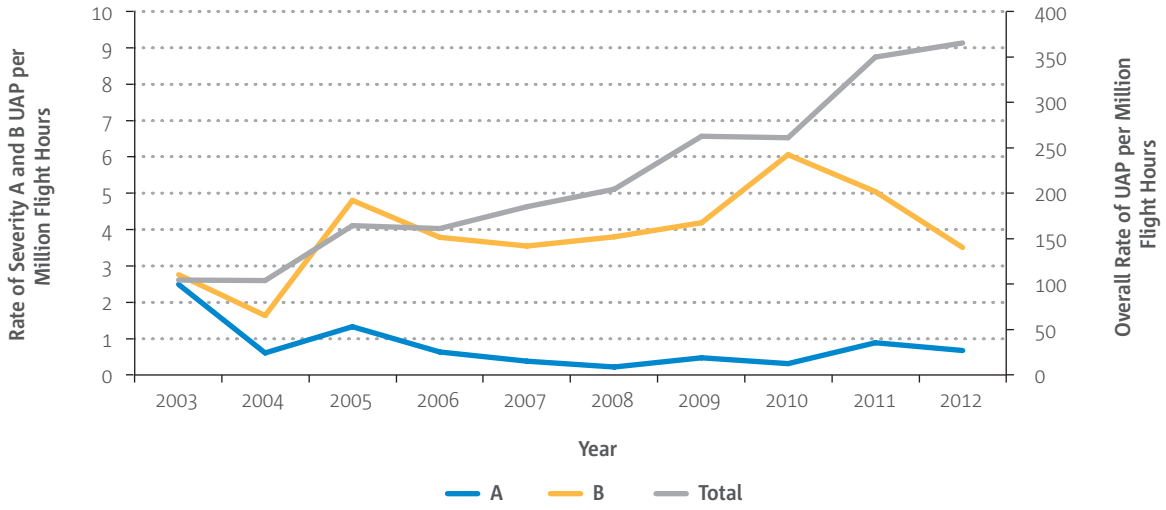


Figure 54 shows the rate of reported IS for the period 2003-2012. It can be seen that the rate has substantially increased since 2009, indicating a possible improvement in reporting. However, the rate of major incidents (severity B) has also increased.

Figure 54: Rate of Inadequate Separations per Million Flight Hours in EASA MS FIRs, 2003-2012

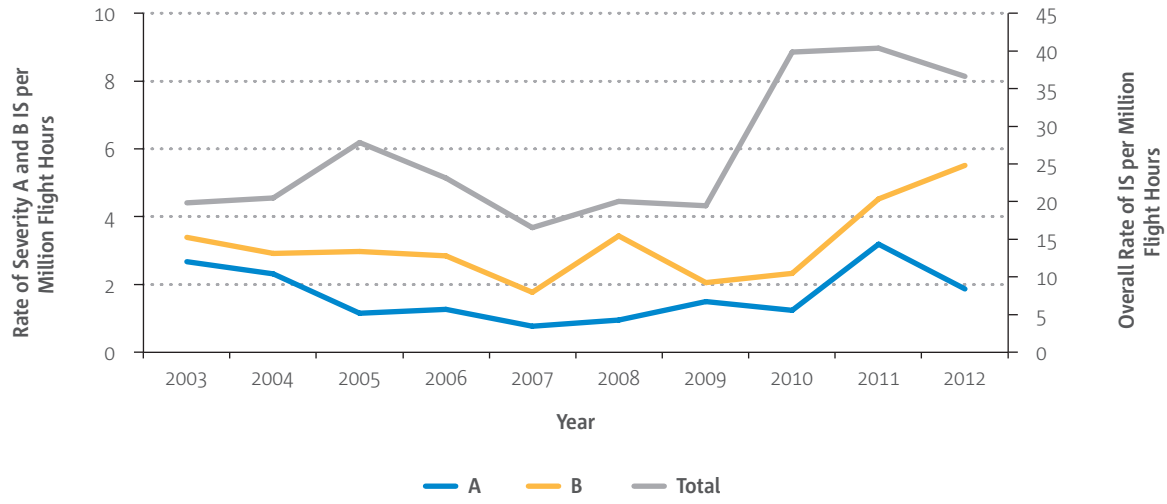
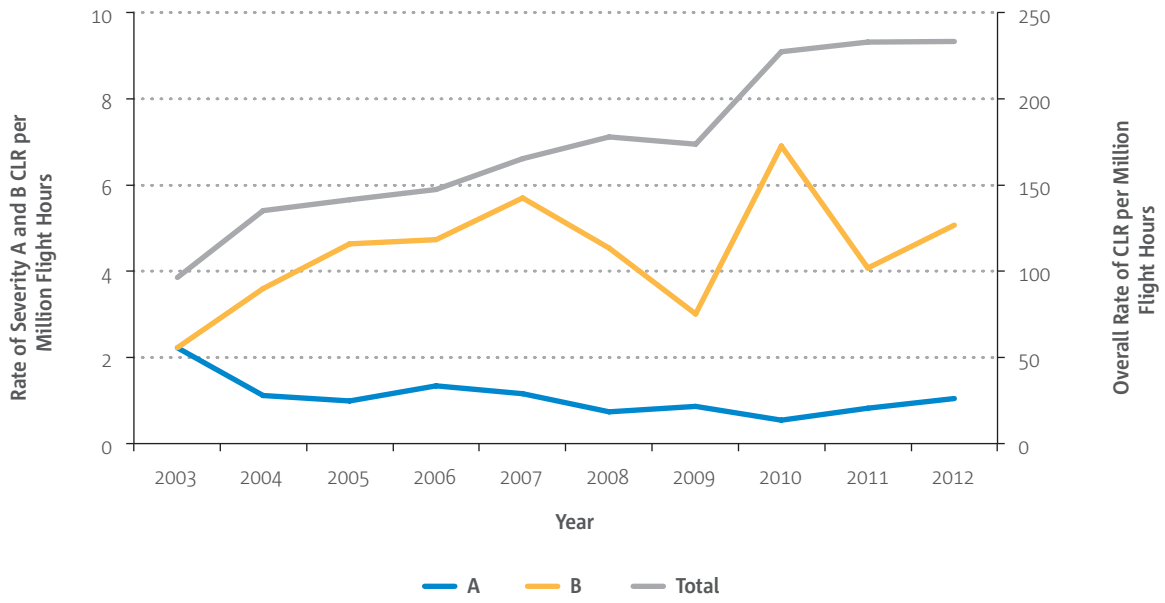


Figure 55 shows the rate of deviations from ATC clearances and again the increase in reporting rate is clearly observable. The rate of major incidents has also increased while the rate of serious incidents has decreased.

Figure 55: Rate of Deviations from ATC Clearances per Million Flight Hours in EASA MS FIRs, 2003-2012



9

European Central Repository

Introduction

For over 20 years, the European Commission has been developing the concept of a centralised aviation safety data collection process, which is known as the European Coordination Centre for Accident and Incident Reporting System (ECCAIRS). Under this process, all safety occurrences from the EASA Member States (MS) are collected in a centralised database – the European Central Repository (ECR).

European Directive 2003/42/EC on occurrence reporting in civil aviation placed an obligation on the EU States to make 'all relevant safety-related information' stored in their databases available to the competent authorities of other MS and the European Commission. The EASA MS were also required to make sure that their databases were compatible with the ECCAIRS software. Furthermore, according to Commission Regulation (EC) No 1321/ 2007, the EASA MS were obliged to integrated their occurrence data into the ECR. By the end of 2011, all of the EASA MS were integrating their data into the ECR.

The integration of occurrences into the ECR is vital in supporting the aviation safety management work of EASA and the EASA MS because it provides the widest possible source of Pan-European safety data. The more information that is available in the ECR and the better quality of that information, the more knowledge and information that can be used by decision makers to develop the sustainable solutions required by both the aviation industry and the travelling public.

Thanks to the efforts of the EASA MS the amount of information in the ECR is increasing every year and the quality of data has improved significantly over the past 2 years. This means that the vision of the ECR being a vital resource for safety analysis at European Level is becoming a more realistic prospect. This Chapter provides some key statistics concerning the safety information available in the ECR and it also provides information on how the ECR is helping to support the work of improving aviation safety in Europe.

This chapter includes data from 2005-2012 so that the changes in reporting from the beginning of the ECR to the present day are observable.

The ECR at a Glance

At the end of 2012 there were a total of 664,149 occurrences in the ECR. Figure 56 provides details of the occurrences in the ECR by the date of occurrence. In the early years of the ECR, between 2005 and 2009 there was a steady increase in the number of occurrences that were made available by the EASA MS . Since 2009 the number of occurrences has begun to stabilise in the region of 100,000 to 120,000 occurrences per year. The pooling of such a large number of occurrences in a single database highlights the importance of the ECR for use by EASA and the EASA MS in their analysis because it provides a far greater amount of information that would be available to any single country through their own resources. The challenge is to continually improve the quality of the data provided by the EASA MS so that it is able to provide enough detailed information to support the decision making process in its own right without the need to refer to other data or information sources. The task of continually improving data quality is part of a major effort across the European Aviation Community as part of work with European Commission (DG MOVE and the JRC), EASA, Eurocontrol and the responsible entities of the EASA MS.

Figure 56: Number of Occurrences in the ECR per Year, 2005-2012

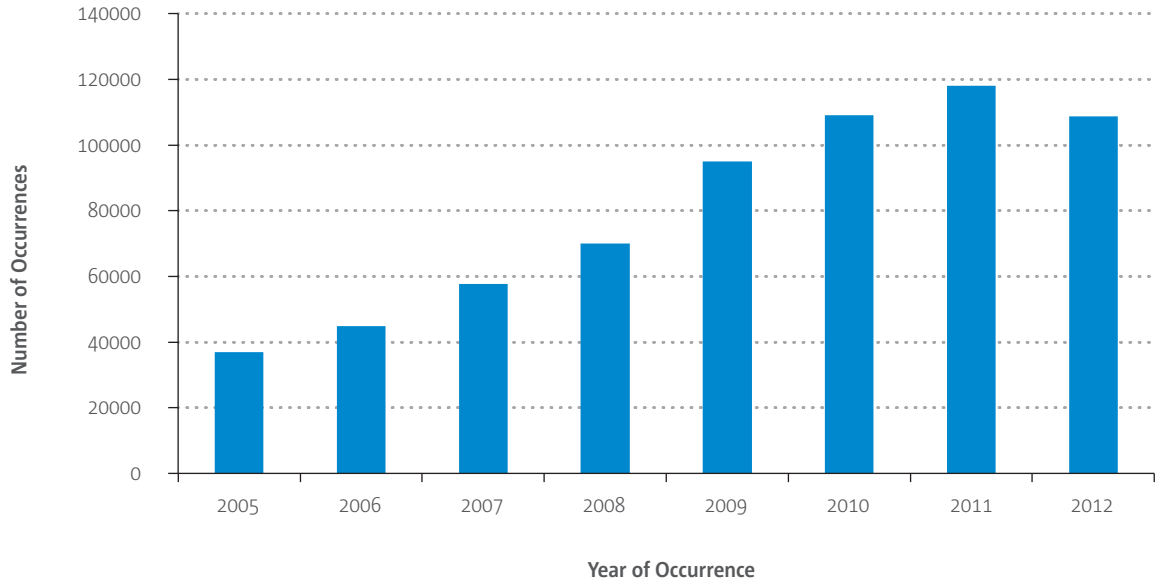


Figure 57: Proportion of Occurrences in the ECR by Operation Type, 2005-2012

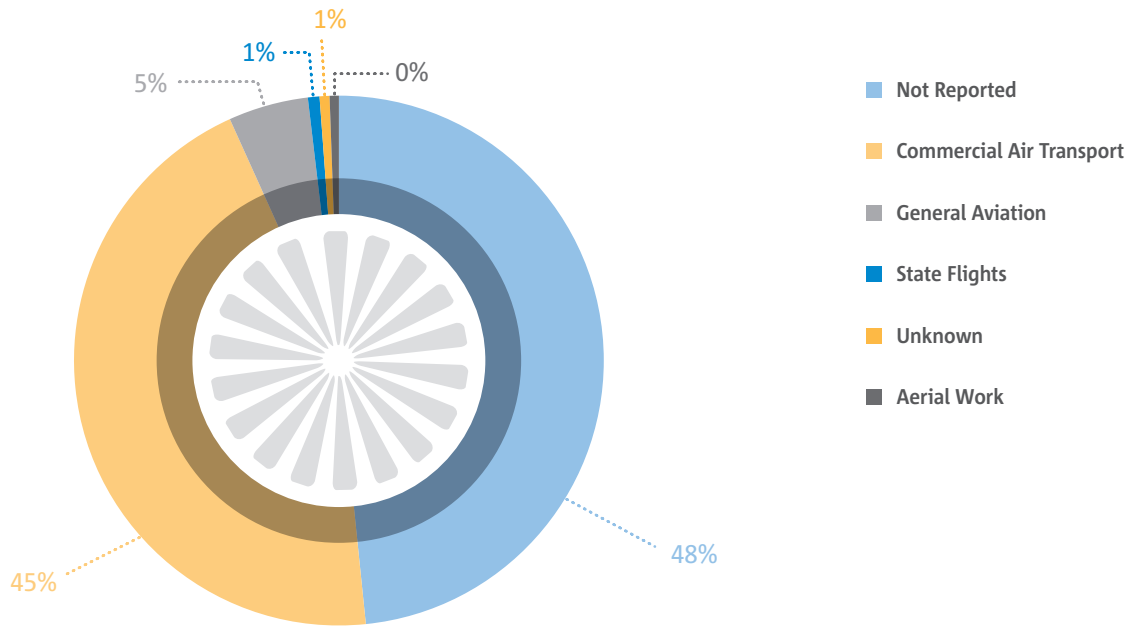
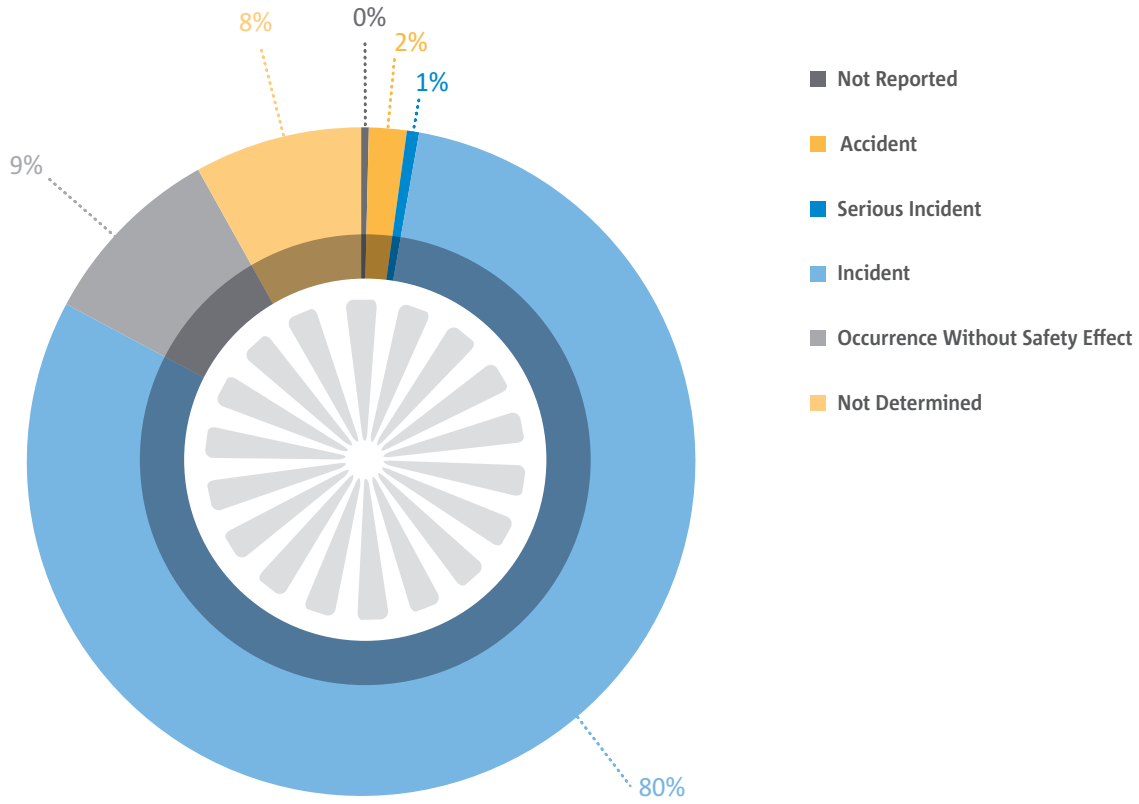


Figure 57 provides details of the distribution of occurrences in the ECR by operation type. In the majority of cases, 48%, this information was not reported to the ECR. However, from discussion with the Member States it is considered that the majority of these are likely involve Commercial Air Transport, which already account for 45% of the occurrences reported to the ECR. General Aviation accounted for 5% of the occurrences and State Flights were 1% of the occurrences. A smaller number of occurrences, less than 1%, involved Aerial Work.

Figure 58: Proportion of occurrences in the ECR by Occurrence Class, 2005-2012



The distribution of occurrences in the ECR by occurrence class is provided in Figure 58. It is particularly interesting to note that only 2% of the occurrences in the ECR involves accidents, whilst 80% of the occurrences are incidents that are not normally found in other sources of data.

Network of Analysts

Analysis of the ECR at a European Level is carried out by the Network of Analysts (NoA), that brings together the safety analysis departments of the competent authorities with EASA, Eurocontrol and European Commission to use the information in the ECR to support safety planning activity. The NoA uses the information in the ECR with a range of other data sources to help identify the safety risks to inform the European Aviation Safety Plan (EASp). The NoA also provides a mechanism for the EASA MS to work together to improve the quality of data in the ECR.

Occurrence Categories and Events in the ECR

Within the ECR, there is some useful information concerning the types of occurrences and the events of the occurrences reported by the EASA MS.

Figure 59: Top 10 Occurrence Categories in the ECR, 2005-2012

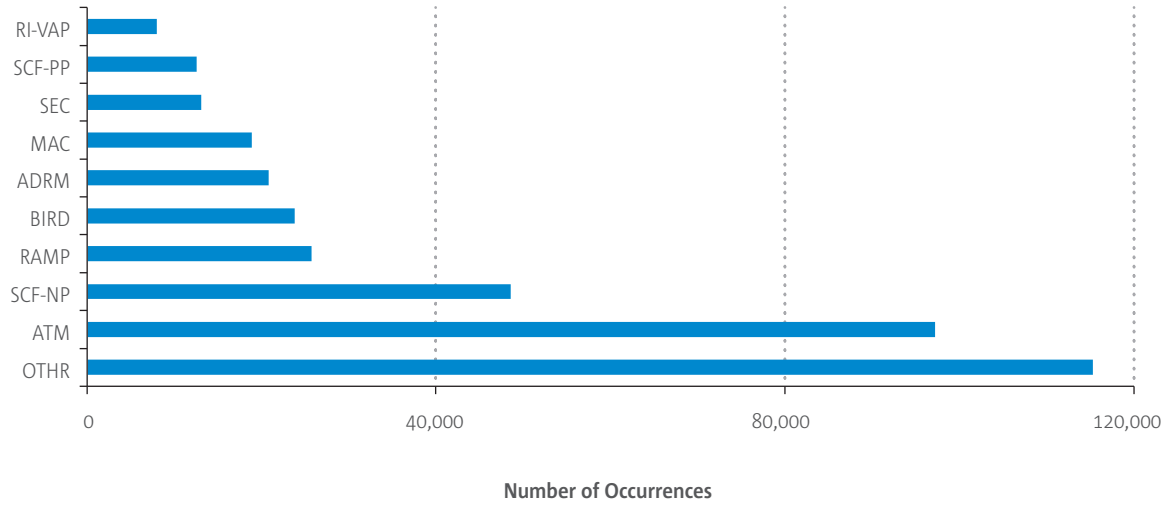


Figure 59 provides details of the Top 10 occurrence categories within the ECR. The largest number of occurrences were classified as "Other", which is the same situation as last year. Work has recently been carried out to analyse occurrences classified as "Other" and this has identified that a large number of these involve medical situations involving either crew members or passengers and a new occurrence category covering this type of occurrence will be introduced in the near future. The following most numerous occurrence categories were ATM/ CNS, System/ Component Failure - Non-Powerplant (SCF-NP), Ground Handling (RAMP) and Birdstrikes (BIRD).

Figure 60: Top 5 Level 1 Event Types in the ECR, 2005-2012

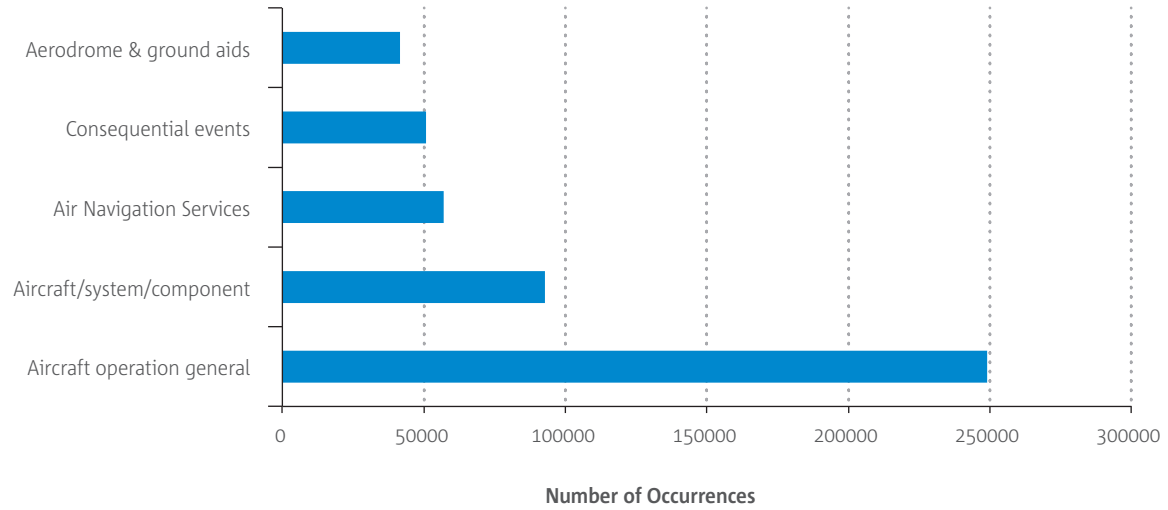
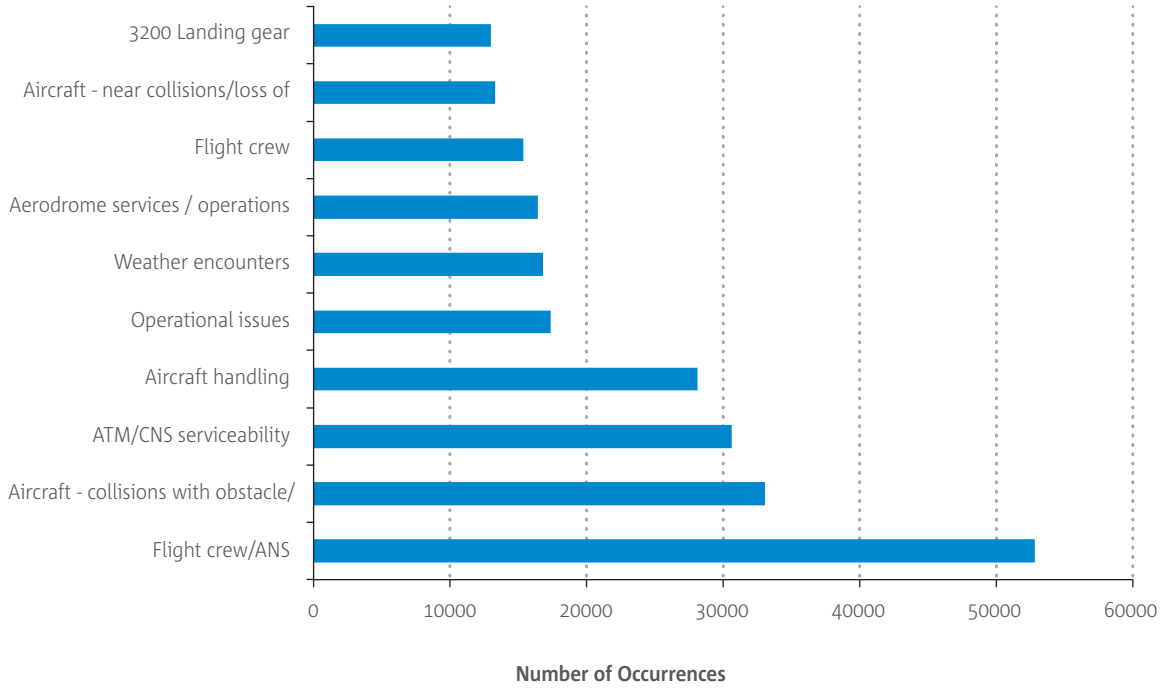


Figure 60 provides a more detailed analysis of the occurrences in the ECR using information on the Level 1 Event Types. Critical events during an occurrence are coded using standard event types and these are captured in the chronological order in which they took place. The most numerous Event Type, Level 1, was Aircraft Operation General, followed by Aircraft/ System/ Component and Air Navigation Services.

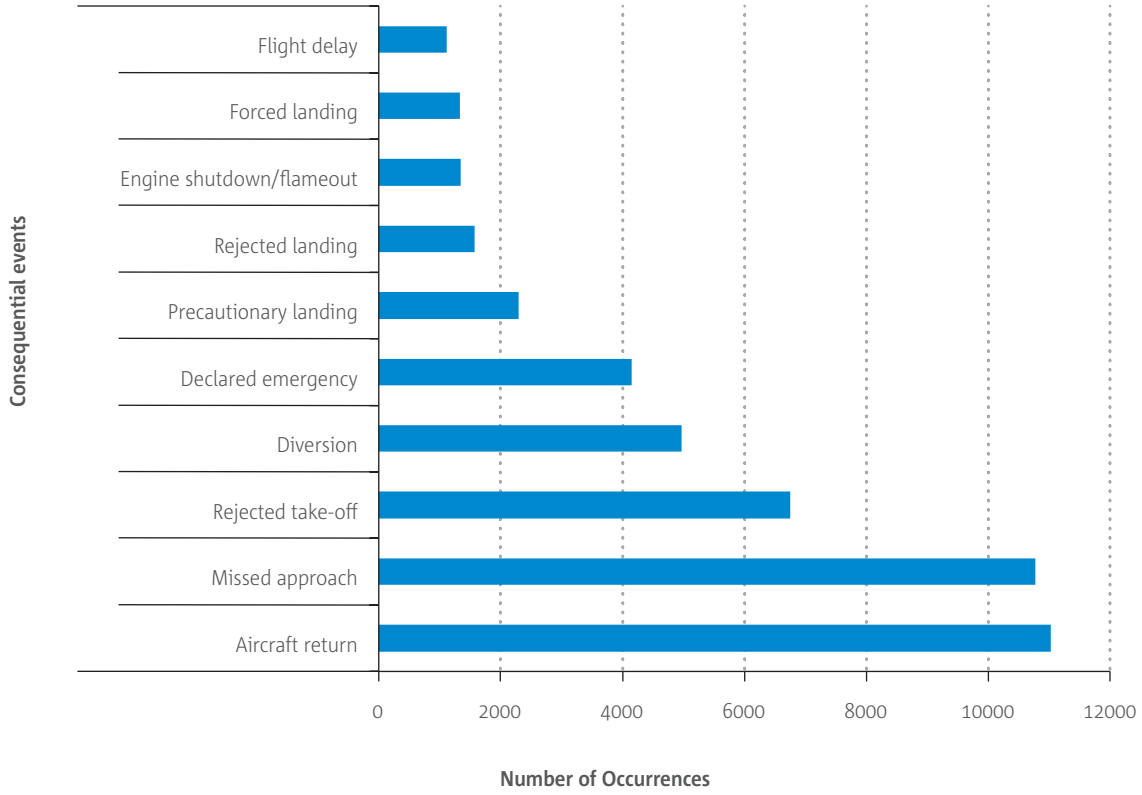
A more detailed analysis of the Event Types is shown in Figure 61, which has information on the Top 10 Level 2 Event Types. The most numerous Level 2 Event Type is Flight Crew/ ANS, which involves interaction between the Flight Crew of an aircraft and the Air Navigation Services. This is followed by Aircraft – Collision with Obstacle/ Terrain/ Aircraft, which is often used to classify occurrences where there has been a near miss, therefore this number is not indicative of the number of actual collisions. Other Level 2 Event Types found in the Top 10 include the serviceability of ATM Systems and Aircraft Handling.

Figure 61: Top 10 Level 2 Event Types in the ECR, 2005-2012



Information on the Consequential Events of occurrences in the ECR is shown in Figure 62. Consequential Events are used to describe the effects of the occurrence of the operation of the aircraft. The most often consequences of occurrences in the ECR were Aircraft Return, where the aircraft was forced to return to its original departure point following the occurrence. There were also occurrences involving Missed Approaches, Rejected Take-Offs and Diversions (where the aircraft was forced to divert from its planned destination to another airport). There were also just over 4000 occurrences were the flight crew declared an emergency.

Figure 62: Top 10 Consequential Events in the ECR, 2005-2012



The number of occurrences in the ECR is continuing to grow every year and most importantly, the quality of data has improved significantly over the past few years. The information that the ECR provides, in addition to other sources of data from aircraft accidents is vital to providing the best possible knowledge of the key risks to aviation in Europe.

10 Agency's Safety Actions

The results of safety analysis work are combined with expert judgement, research and safety recommendations to guide the Agency's safety actions. The actions are published every year in the European Aviation Safety Plan (EASp).

The EASp describes what the major risks in Europe's aviation system are and the numerous actions that are underway to mitigate them. Actions in the EASp encompass not only the work that is carried out by the Agency, but also the efforts of the EASA Member States (MS), the aviation industry and other stakeholders such as Eurocontrol, the Performance Review Body and the European Commission. This work complements what is done by the Member States to mitigate safety risks at their level. In order to provide a clear picture of the activities performed by the various safety initiatives and teams, a report on the progress made and main products developed is included with each update of the EASp.

A copy of the European Aviation Safety Plan is available at www.easa.europa.eu/sms

Appendices

Appendix 1 Acronyms and Definitions

Accident	An occurrence associated with the operation of an aircraft, which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which: a) a person suffers a fatal or serious injury as a result of: • being in or upon the aircraft; • 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 the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents or puncture holes in the aircraft skin; or c) the aircraft is missing or is completely inaccessible. Source: ICAO Annex 13
Aerial work (AW)	An aircraft operation in which an aircraft is used for specialised services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, or aerial advertisement.
ANS	Air Navigation Services
ASR	EASA Annual Safety Review
AST	Annual Summary Template
ATC	Air Traffic Control
ATM	Air Traffic Management
Commercial Air Transport (CAT)	An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.
CAST	Commerical Aviation Safety Team
CICTT	CAST-ICAO Common Taxonomy Team
CNS	Communications, Navigations and Surveillance
EASA	European Aviation Safety Agency
EASA MS	European Aviation Safety Agency Member States. These States are the 27 European Union Member States plus Iceland, Liechtenstein, Norway and Switzerland.
EASp	European Aviation Safety Plan
ECCAIRS	European Co-Ordination Centre for Aviation Incident Reporting Systems
EC	European Commission
ECR	European Central Repository for occurrences

EU	European Union
Fatal Accident	An accident that resulted in at least one fatality, flight crew and/or passenger or on the ground, within 30 days of the accident. Source: ICAO Annex 13
Fatal Injury	An injury which is sustained by a person in an accident and which results in his death within 30 days of the date of the accident. Source: ICAO Annex 13
FIR	Flight Information Region
FOD	Foreign Object Debris
General Aviation (GA)	An aircraft operation other than a commercial air transport operation or an aerial work operation.
HEMS	Helicopter Emergency Medical Service
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
Light Aircraft	Aircraft with a maximum certificated take-off mass below 2 251 kg.
MTOM	Maximum certificated take-off mass
NAA	National Aviation Authorities
Off-shore	An off-shore operation is an aircraft flight to a landing site off the coast, for example an oil or gas platform. Note, this should not be confused with “off-shore” in the sense of “outside territorial waters”.
Occurrence	An accident, serious incident or incident
Scheduled air service	An air service open to use by the general public and operated according to a published timetable or with such a regular frequency that it constitutes an easily recognisable systematic series of flights which are open to direct booking by members of the public.
Serious Incident	An incident involving circumstances indicating that an accident nearly occurred.
Serious Injury	An injury which is sustained by a person in an accident and which: a) requires hospitalisation for more than 48 hours, commencing within seven days from the date the injury was received; b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); c) involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; d) involves injury to any internal organ; e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or f) involves verified exposure to infectious substances or harmful radiation.
SMS	Safety Management System
Third country operated aircraft	An aircraft which is not used or operated under control of a competent authority of an EASA Member State.

Occurrence Categories:

Occurrence categories can be used to classify occurrence at a high level to permit analysis of the data. The CICTT has developed the occurrence categories used in this Annual Safety Review. For further details on this team and the occurrence categories see the website (http://intlaviationstandards.org/index.html).

ARC	Abnormal runway contact
AMAN	Abrupt manoeuvre
ADRM	Aerodrome
ATM/CNS	Air Traffic Management/Communication Navigation Surveillance
BIRD	Collision / near Collision with bird(s)
CABIN	Cabin safety event
CFIT	Controlled flight into or toward terrain
CTOL	Collision with obstacle(s) during take-off and landing
EVAC	Evacuation
EXTL	External load related occurrence
F-NI	Fire/smoke (non-impact)
F-POST	Fire/smoke (post-impact)
FUEL	Fuel related
GCOL	Ground collision
GTOW	Glider towing related event
RAMP	Ground handling
ICE	Icing
LOC-G	Loss of control — Ground
LOC-I	Loss of control — In-flight
LOLI	Loss of lifting conditions en-route
LALT	Low altitude operation
MAC	Airprox/TCAS alert/loss of separation/near midair collisions/midair collision
OTHR	Other
RE	Runway excursion
RI-A	Runway incursion — Animal
RI-VAP	Runway incursion — Vehicle, aircraft or person
SEC	Security related
SCF-NP	System/component failure or malfunction (non-powerplant)
SCF-PP	System/component failure or malfunction (powerplant)
TURB	Turbulence encounter
UIMC	Unintended Flight in IMC
USOS	Undershoot/overshoot
UNK	Unknown or undetermined
WSTRW	Windshear or thunderstorm

ATM Accident Categories Acronyms

CLR	Deviation of ATC Clearance
IS	Inadequate Separation
MAC	Mid-Air Collision
SMI	Separation Minima Infringement
UAP	Unauthorised Penetration of Airspace
RI	Runway Incursion is an occurrence involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft.
COL	Collision with a vehicle, person or aircraft, while an aircraft is on the ground

Appendix 2 List of Figures and Tables

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Appendix 3 List of Fatal Accidents in 2012

This list only includes worldwide fatal accidents involving commercial air transport aeroplanes with a maximum take-off mass above 2,250 kg

Local Date	State of Occurrence	Aircraft Type	Operation Type	Fatalities on Board	Ground Fatalities	Occurrence Categories
30/01/2012	DR Congo	ANTONOV AN-28	Cargo	3	0	UNK: Unknown or undetermined
16/02/2012	Brazil	BEECH 55	Passenger	4	0	UNK: Unknown or undetermined CTOL: Collision with obstacle(s) during take-off and landing
28/02/2012	Brazil	CESSNA 208	Ferry/ positioning	1	0	UNK: Unknown or undetermined CTOL: Collision with obstacle(s) during take-off and landing
01/03/2012	Chile	PIPER PA-31	Passenger	7	0	UNK: Unknown or undetermined
15/03/2012	Puerto Rico	CONVAIR 440	Cargo	2	0	SCF-PP: powerplant failure or malfunction
02/04/2012	Russian Federation	ATR 72-200	Passenger	31	0	ICE: Icing, LOC-I: Loss of control - inflight
08/04/2012	Indonesia	DE HAVILLAND DHCG-300	Passenger	1	0	GCOL: Ground Collision EC: Security related
20/04/2012	Pakistan	BOEING 737-200	Passenger	127	0	CFIT: Controlled flight into or toward terrain F-POST: Fire/smoke (post-impact)
21/04/2012	Bolivia	CURTISS WRIGHT C46	Cargo	3	0	UNK: Unknown or undetermined
14/05/2012	Nepal	HINDUSTAN	Passenger	15	0	CTOL: Collision with obstacle(s) during take-off and landing
02/06/2012	Ghana	BOEING 727-200	Cargo	0	12	RE: Runway excursion UNK: Unknown or undetermined CTOL: Collision with obstacle(s) during take-off and landing
03/06/2012	Nigeria	DOUGLAS DC9-80	Passenger	153	10	SCF-PP: powerplant failure or malfunction CTOL: Collision with obstacle(s) during take-off and landing
06/06/2012	Uruguay	SWEARINGEN SA-227	Cargo	2	0	UNK: Unknown or undetermined
22/06/2012	United States	BEECH 90	Ferry/ positioning	1	0	CFIT: Controlled flight into or toward terrain
07/07/2012	United States	BEECH 90	Ferry/ positioning	1	0	WSTRW: Windshear or thunderstorm.

Local Date	State of Occurrence	Aircraft Type	Operation Type	Fatalities on Board	Ground Fatalities	Occurrence Categories
19/08/2012	Sudan	ANTONOV AN-26	Passenger	32	0	CFIT: Controlled flight into or toward terrain UNK: Unknown or undetermined
22/08/2012	Kenya	LET L410	Passenger	4	0	UNK: Unknown or undetermined
12/09/2012	Russian Federation	ANTONOV AN-28	Passenger	10	0	UNK: Unknown or undetermined
28/09/2012	Nepal	DORNIER 228-200	Passenger	19	0	BIRD: Birdstrike
07/10/2012	Antigua and Barbuda	BRITTEN NORMAN BN2A-26	Passenger	2	0	RE: Runway excursion UNK: Unknown or undetermined
07/10/2012	Arkansas	GRUMMAN G44	Ferry/ positioning	1	0	CTOL: Collision with obstacle(s) during take-off and landing
07/10/2012	Sudan	ANTONOV AN-12	Cargo	15	0	SCF-PP: powerplant failure or malfunction
06/11/2012	United States	CESSNA 208	Cargo	1	0	SCF-PP: powerplant failure or malfunction CTOL: Collision with obstacle(s) during take-off and landing
11/11/2012	Italy	AIRBUS A320	Passenger	0	1	RAMP: Ground Handling
30/11/2012	DR Congo	ILYUSHIN IL-76	Cargo	7	25	CTOL: Collision with obstacle(s) during take-off and landing
17/12/2012	Peru	ANTONOV AN-26	Cargo	4	0	UNK: Unknown or undetermined
22/12/2012	Canada	SWEARINGEN SA-227	Passenger	1	0	RE: Runway excursion
25/12/2012	Myanmar	FOKKER F28	Passenger	1	1	CTOL: Collision with obstacle(s) during take-off and landing
29/12/2012	Russian Federation	TUPOLEV TU-204-120	Ferry/ positioning	5	0	RE: Runway excursion

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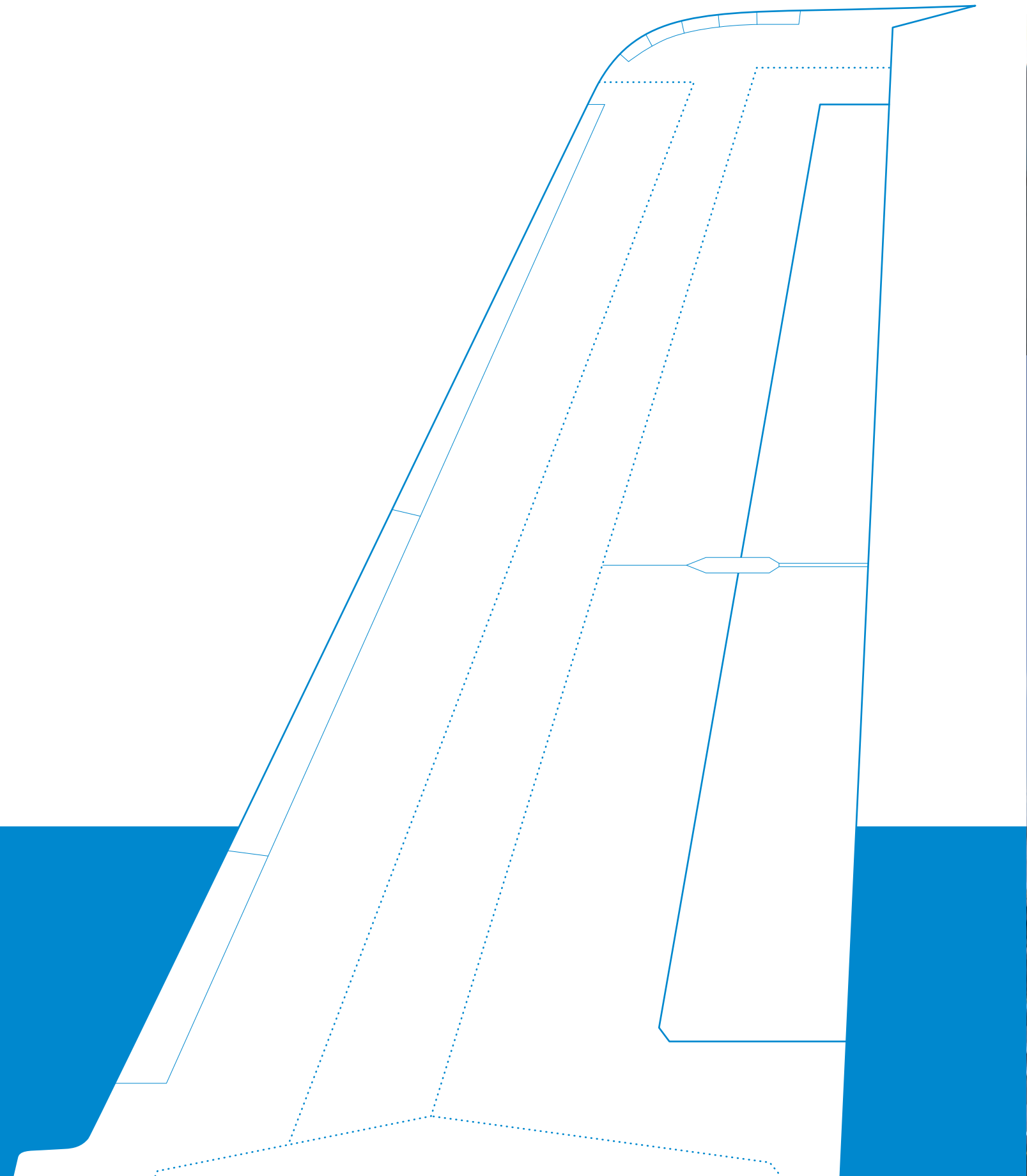







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