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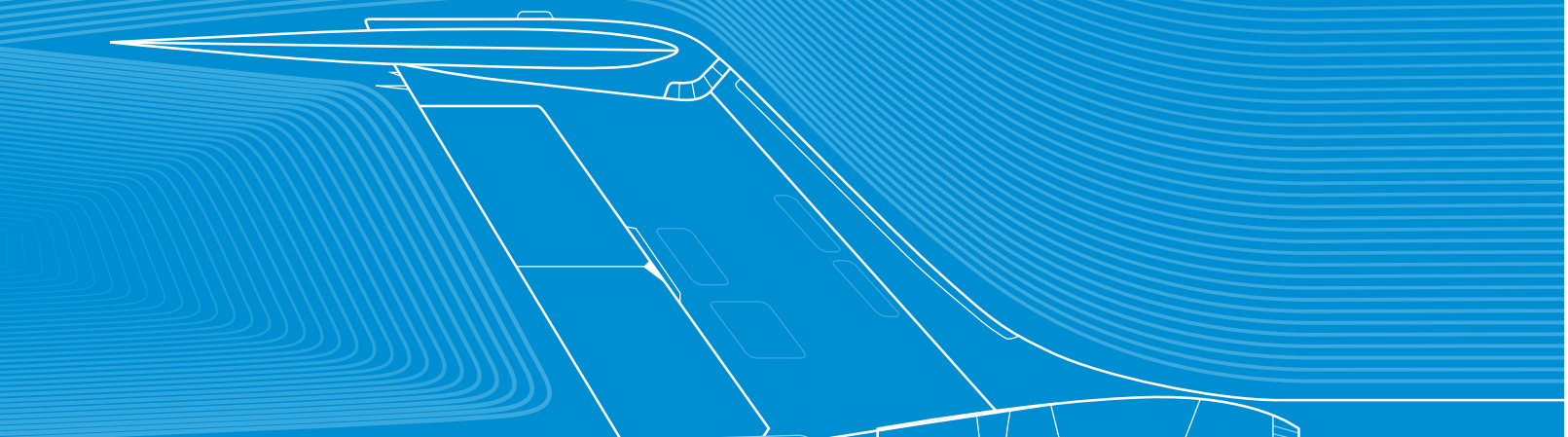

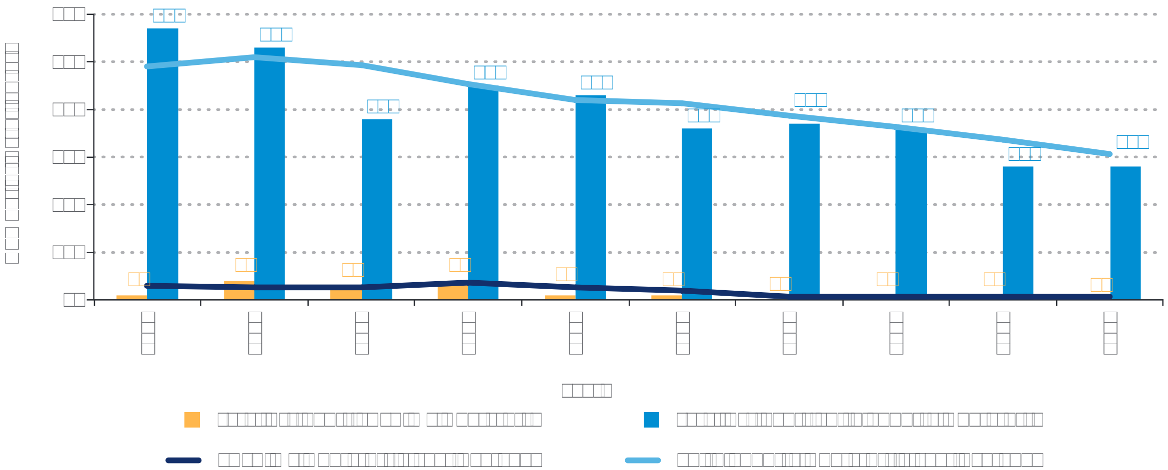

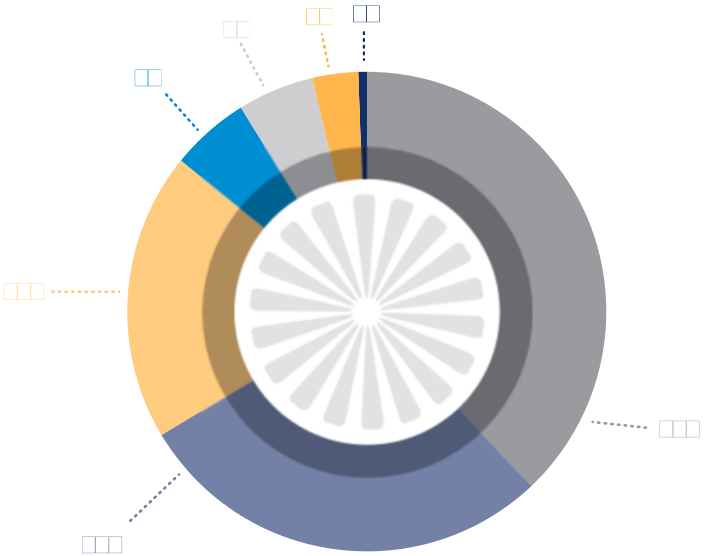

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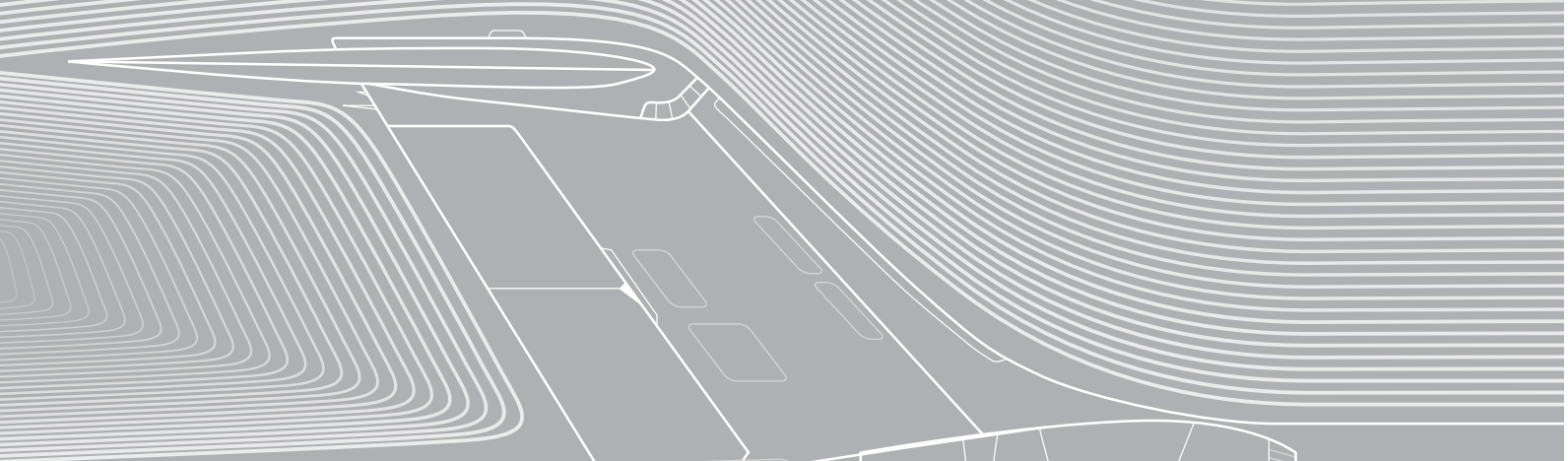
Annual Safety Review 2013



Contents

Disclaimer

The accident data presented is strictly for information purposes only. It is obtained from Agency databases comprised of data from ICAO, EASA Member States, Eurocontrol and the aviation industry. It reflects knowledge at the time the report was generated. Whilst every care has been taken in preparing the content of the report to avoid errors, the Agency makes no warranty as to the accuracy, completeness or currency of the content. The

Foreword by the Executive Director

This year's Annual Safety Review shows that positive safety trends are continuing in commercial air transport. The EASA region remains one of the safest in the world.

In 2013 there was no fatal accident in commercial air transport aeroplanes in the EASA Member States. Since 2007, there has been a marked decrease in the number of accidents and in the number of persons injured. This consistent trend indicates there is firm improvement in safety. However, we should never overlook that maintaining safety requires vigilance, as a single fatal accident can stop or even reverse this positive trend.

This edition of the Annual Safety Review covers almost all civil aviation activities showing how diverse they can be; from the regular aeroplane flights from one city to another, to a helicopter medical emergency flight in a remote location. It also shows that depending on the type of operation or category of aircraft involved, the events leading to an accident may differ. Each activity has its own risk issues and safety priorities which require using appropriate and proportionate measures.

In order to generate this document, data is derived from the safety occurrences reported by aviation professionals across Europe. I would like to thank everyone who has ever completed a safety report for providing this information, which is vital in helping both organisations and regulators to make informed decisions. The importance of reporting has been recognised at a European level with the adoption of Regulation (EU) 376/2014 on the Reporting, Analysis and Follow-up of Occurrences in Civil Aviation. This regulation strengthens the protection of the reporters and fosters the establishment of 'Just Culture'. In addition, the Review is reliant on the endeavours of the accident investigators, whose diligent work should also be recognised.

This Annual Safety Review is one of the few publications worldwide, which is so rich in safety data and is published with consistent regularity. This publication will continue to evolve and in the future it will be more closely linked to the European Aviation Safety Plan (EASp) which identifies the key safety risks and sets the safety priorities for Europe.

Patrick Ky

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

Data included in the Review come 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 2004-2013, however when there is insufficient good-quality data the analysis has been limited to 2009-2013.

Between 2004 and 2013 there were 106 million IFR flights in EASA member states flight information regions

Between 2004 and 2013, there were approximately 106 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 2009 and 2010. There were 10.25 million IFR flights in 2013, compared with 11.2 million in 2008.

In 2013, there were 18 accidents that involved EASA MS Operated Commercial Air Transport Aeroplanes

In 2013 there were no fatal accidents involving an EASA MS operated aeroplanes. There has only been one fatal accident in the past two years, which is an improvement on the 10 year average of 2.3 fatal accidents per year between 2002-2011. The 18 accidents involving EASA MS operated aeroplanes in 2013 represents a decrease of 46% when compared with the 33 accidents in 2012 and was 27% lower than the 10 year average over the period 2002-2011 of 24.6 accidents per year. The most common accident type is “abnormal runway contact” while the most common type of fatal accident is “loss of control in flight”.

2013 Commercial Air Transport Helicopters data shows that there were 7 accidents, of which 3 were fatal. The most common type of accident is “loss of control in flight” and it is also the most common type of fatal accident.

2013 Aerial work accident figures reflect a 12% decrease in Aeroplane accidents and a 24% reduction in Helicopter accidents when compared with average annual accidents from 2002-2011

Correspondingly, there was a 35% reduction in the number of Aerial Work aeroplane fatal accidents while Aerial Work helicopter fatal accident numbers decreased by only 2%. Fatalities on board Aerial Work aeroplanes

Decrease in Ramp related accidents at EASA MS Aerodromes in 2013

At EASA MS Aerodromes only one accident related to Ramp operations was reported in 2013, which is a significant decrease compared to the previous four years where an average of 5.25 accidents in Ramp operations were reported. There were 3 serious incidents reported in Ramp operations in 2013, which is a similar number compared to the previous years. The number of Runway Excursions and Ground Collisions at EASA MS Aerodromes increased slightly in 2013.

Using 2013 ATM data, 49 accidents (16 fatal and 33 non-fatal) were reported. None of the reported accidents had either a Direct or Indirect ATM Contribution

During the last five years (2009-2013) there were only 6 accidents that had a direct ATM contribution. Of these accidents 3 are categorised as 'Ground collision' (GCOL) between an aircraft and a vehicle or obstacle and 3 in the category 'Other'. During the same five year period a total number of 337 accidents were reported to EUROCONTROL, of which 66 were fatal.

The European Central Repository is a centralised database of safety occurrences from all EASA Member States

At the end of 2013 there was a total of 800,614 occurrences in the ECR. In the early years of the ECR, between 2006 and 2009, there was a steady increase in the number of occurrences that was made available by the Member States. Since 2009 the number of occurrences has begun to stablise in the range of 80,000 to 95,000 occurrences per year. 2013 has seen a small reduction in the number of safety occurrences provided to the ECR. The overwhelmingly largest occurrence class is Incident, which comprises 79% of the total occurrences followed by Occurrences Without Safety Effect (11%). Accidents account for only 2% of the occcurrences in the ECR.

Background

Air transport is widely considered to be one of the safest forms of travel. In Europe, air transport is also one of the fastest growing transport sectors. 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 for possible improvement. This document provides a high-level overview of aviation-safety statistics in Europe and worldwide.

It is published by EASA in order 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 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 expanding to meet the challenges of the fast-developing aviation sector.

Scope

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

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

- Accident and Serious Incident data for most aircraft categories is from EASA's ADREP database,
- Light Aircraft Accident Data 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. In addition, further refinements of the taxonomy will also result in variations to the data. For this reason, the figures presented in this version of the Annual Safety Review are likely to be slightly different to those presented in previous versions.

In this review, the terms "Europe" and "EASA Member States" are considered as the 28 EU Member States plus Iceland, Liechtenstein, Norway and Switzerland. For Commercial Air Transport operations the region is 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 use statistical tests. This is because the aim of the document is to provide a general 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: Historical Aviation Safety, Air Transport Statistics in EASA MS, Commercial Air Transport, General Aviation, Aerodromes, Air Traffic Management and the 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/

Future of the Review

The general content of the Annual Safety Review has remained constant for a number of years. With the forthcoming implementation of a new European Regulation on the reporting, follow-up and analysis of occurrences in civil aviation, there will be new opportunities to expand the type of analysis presented in subsequent reviews.

A list of acronyms and definitions can be found in Appendix 1.

Introduction

This chapter provides information on the worldwide fatal accident rate for aeroplanes with a maximum take-off mass above 2,250 kg that are 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 million flights of passenger and cargo fatal accidents each year from 1994 to 2013. 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, Scheduled Passenger and Cargo Operations, Fatal Accidents Worldwide, 1994-2013

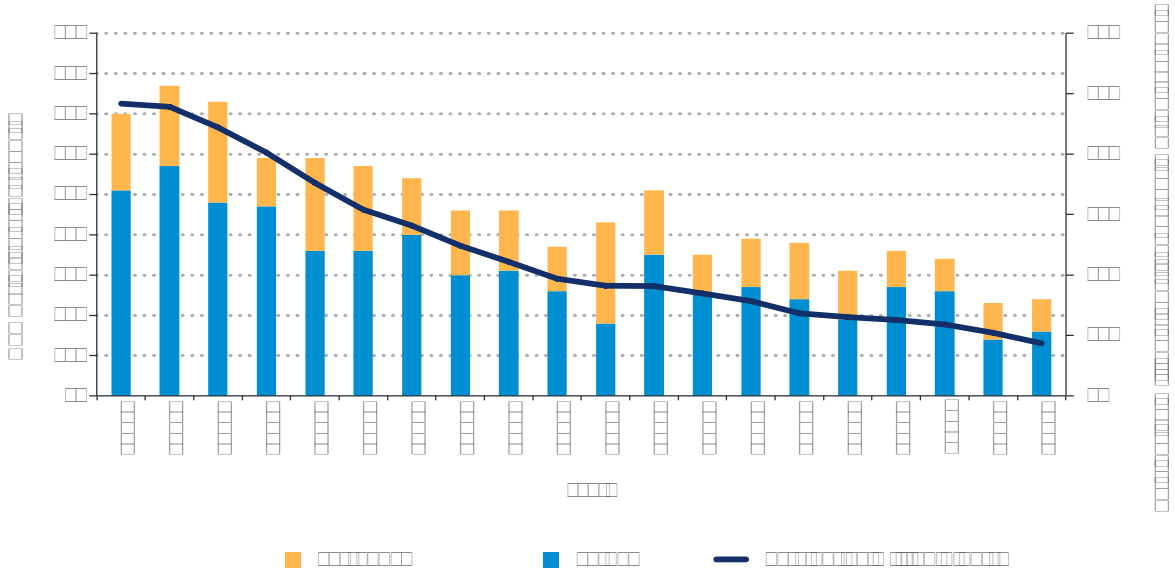


Figure 2 shows the fatal accident rate by region of the world, using the regions defined by the ECCAIRS taxonomy and provided in Appendix 1.

Figure 2: Scheduled Commercial Air Transport Fatal Accident Rate per Million Flights by World Region, 2004-2013


Köln Bonn Airport
Konrad Adenauer

Introduction

This chapter reviews air traffic, the number of passengers carried and the amount of 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 2004 and 2013, there were approximately 106 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 IFR flights per year has decreased since 2011 and in 2013 there were more than 500,000 fewer flights in Europe. There were 10.25 million IFR flights in 2013, compared with 11.2 million in 2008.

Figure 3: Number of IFR Flights in EASA MS per Year, 2004 – 2013

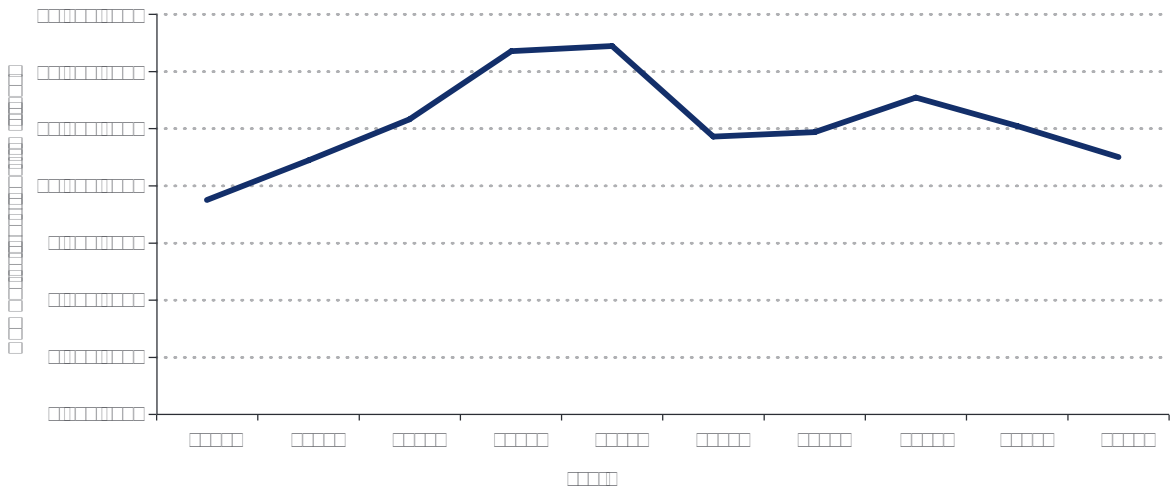
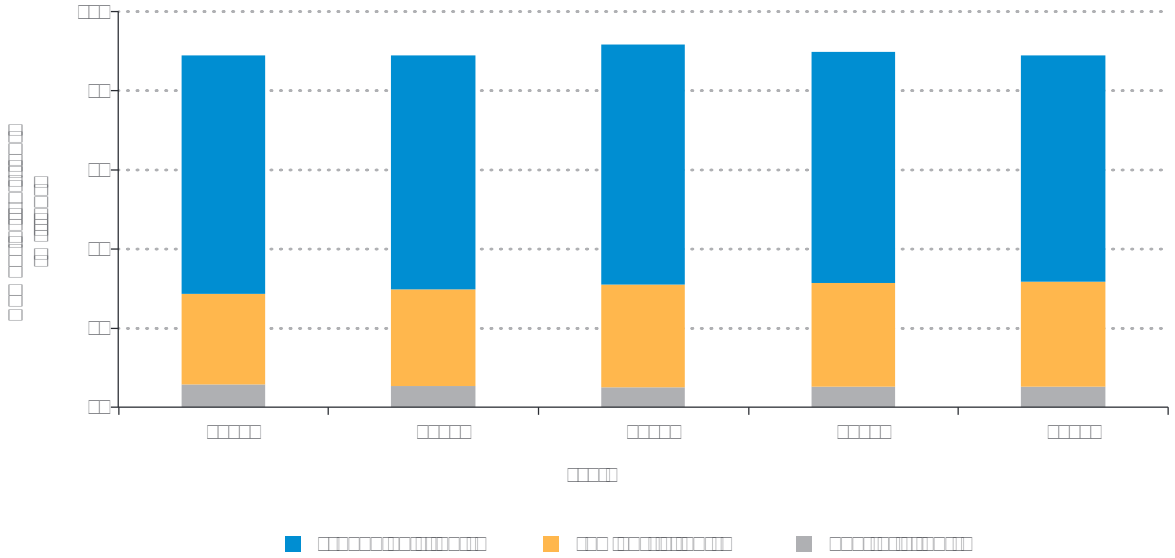


Figure 4: Number of IFR Flights in EASA MS per Year by Market Segment, 2009-2013



The proportion of flights in each sector is shown in Figure 5: 66% of flights are traditional scheduled flights, 28% are low-cost scheduled flights and 6% are charter flights.

Figure 5: Proportion of Flights in Each Market Segment, 2009-2013

Flights Conducted by EASA Member States Registered Aircraft

The types of aircraft filing a flight plan are recorded by Eurocontrol's 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, 2009-2013

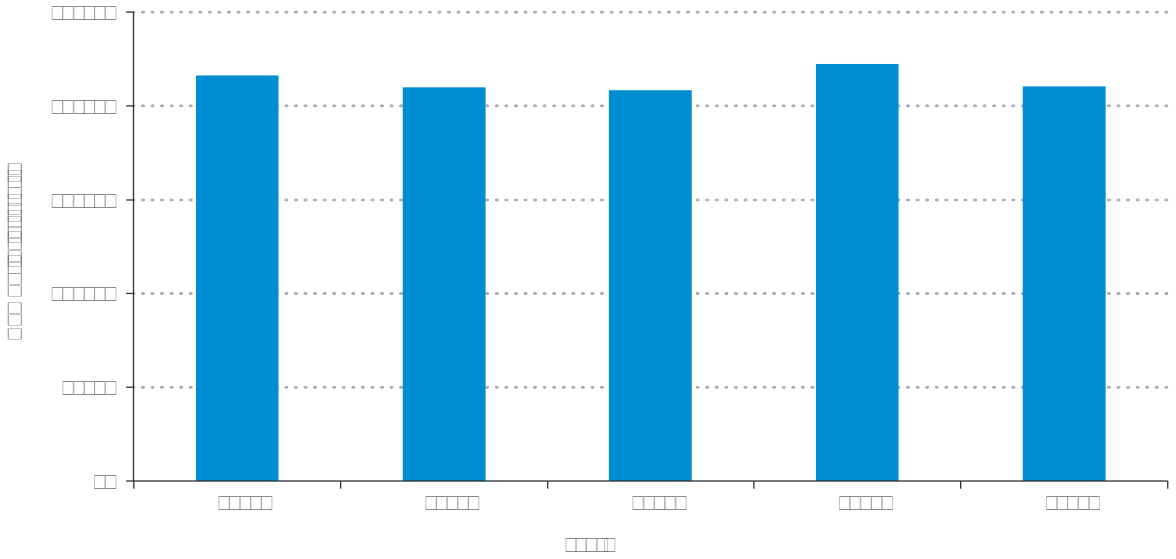
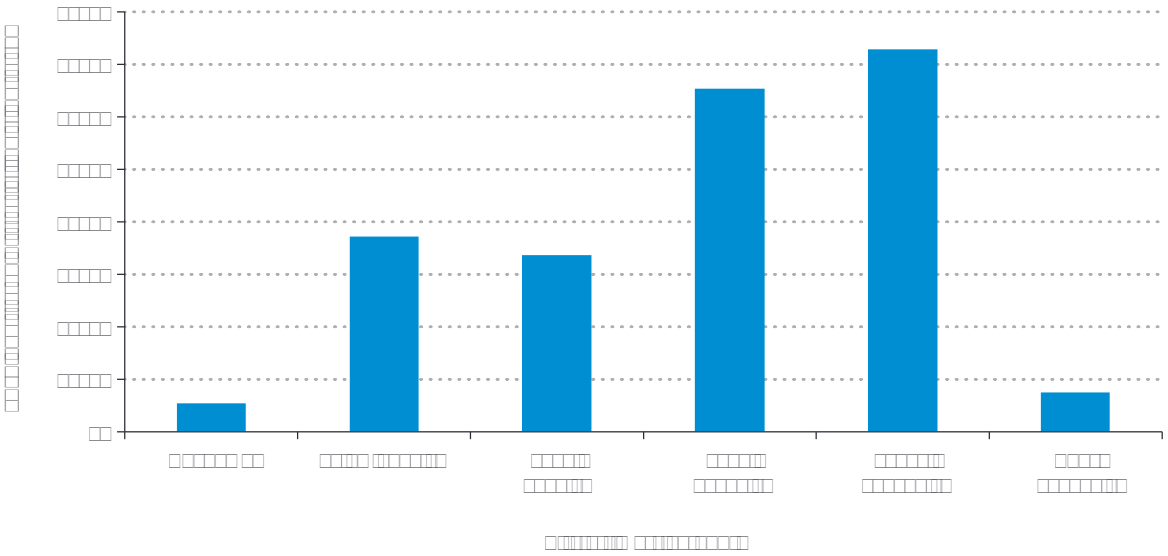


Figure 7: Number of EASA MS Registered Aircraft Filing Flight Plans by Aircraft Category, 2009-2013

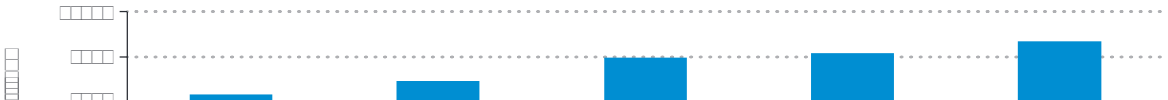
Figure 8: Number of EASA MS Registered Aircraft Filing Flight Plans by Aircraft Mass Category, 2009-2013



Movement of Passengers and Cargo

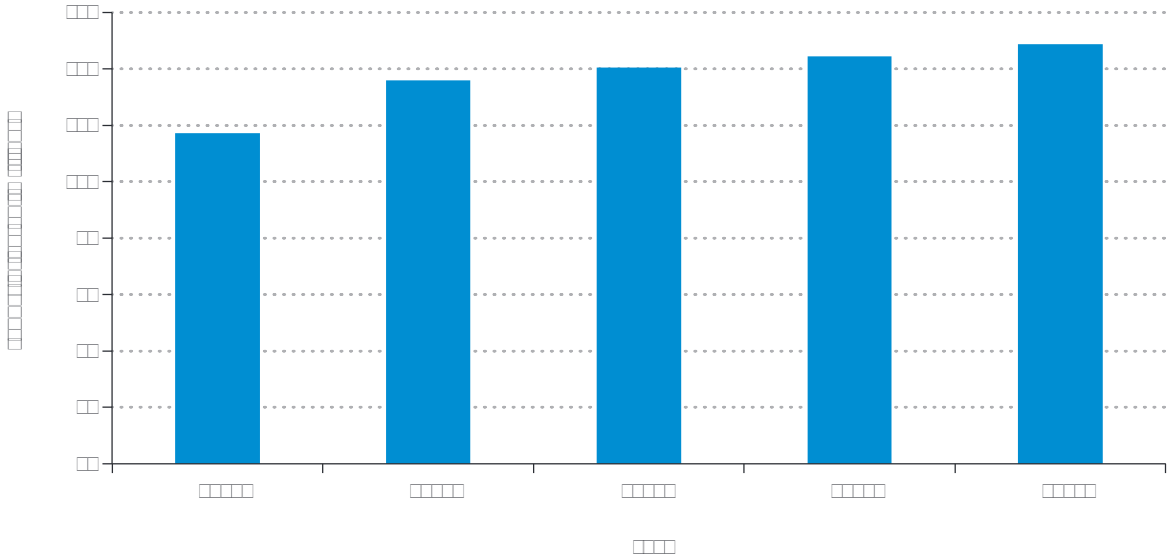
This section shows the number of passengers that were carried and the amount of cargo that was transported in EASA MS from 2009 to 2013: The data was sourced from EUROSTAT. Over the five year period just over 4.4 billion passengers were transported in EASA MS and the total number of passengers carried in EASA MS per year is shown in Figure 9.

Figure 9: Number of Passengers Carried Per Year in EASA MS, 2009-2013



The amount of cargo that was transported per year between 2009 and 2013 is shown in Figure 10. The data reflects that approximately 68.7 million tonnes of cargo were transported in EASA MS between 2009-2013.

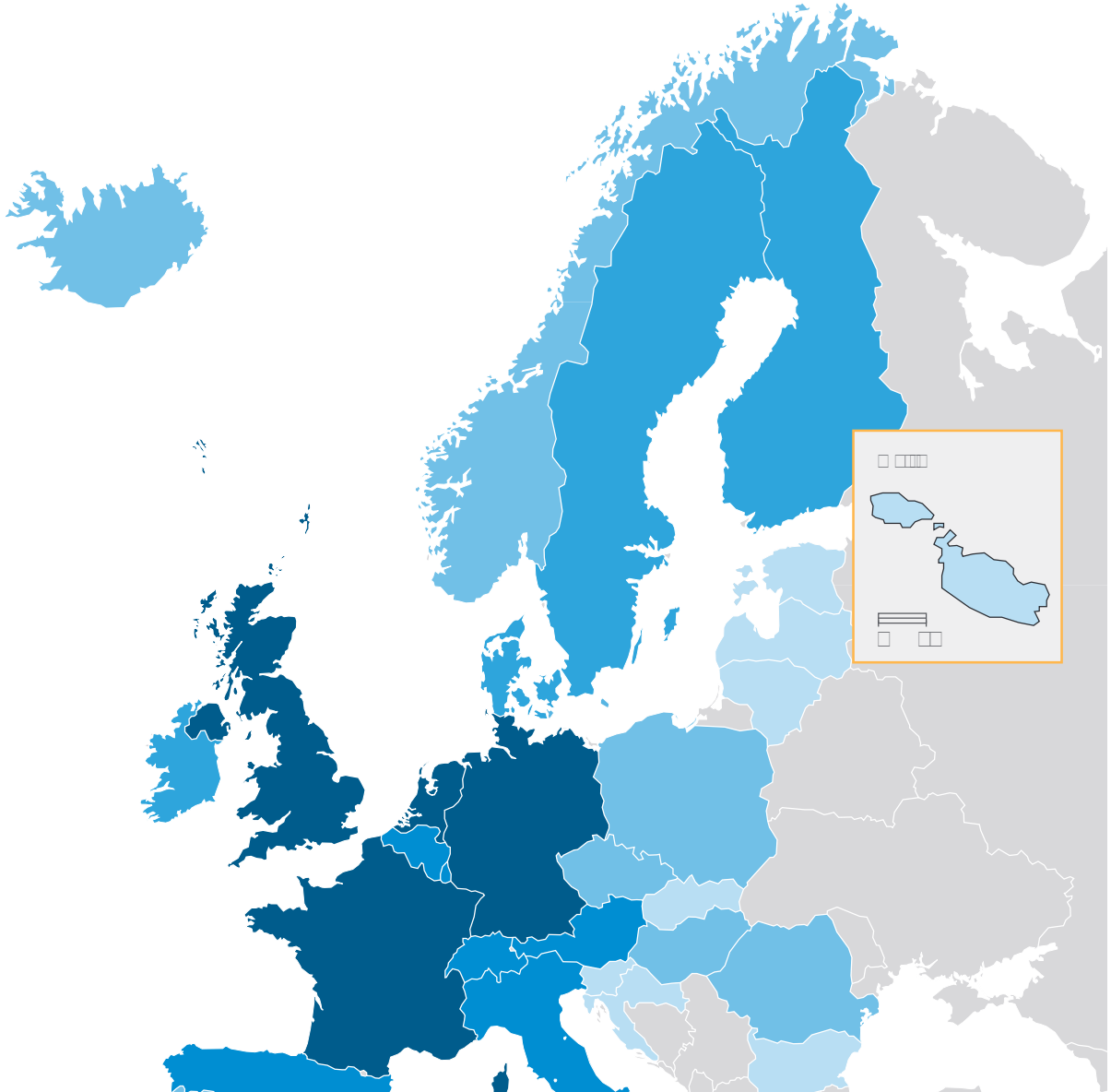
Figure 10: Tonnes of Cargo Carried per Year in EASA MS, 2009-2013



Maps showing the numbers of passengers that were carried and the amount of cargo that was transported in each EASA MS country during 2009-2013 are shown in Figure 11 and Figure 12.

Figure 11: Number of Passengers Carried per Country, 2009-2013

Figure 12: Tonnes of Cargo Transported per Country, 2009-2013

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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 found in 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, and the third on balloons.

Aeroplanes

In 2013 there were no fatal accidents involving an EASA MS operated aeroplanes. This is compared to the previous year where there was a single accident, which occurred in November 2012 when a ground operator was tragically jammed between the baggage door of an Airbus A320 and a baggage loader during the boarding of an aircraft at Rome Fiumicino Airport. There has been only one fatal accident in the last 2 years, which is an improvement on the 10 year average of 2.3 fatal accidents per year between 2002-2011. Table 1 shows that the number of accidents and the number of fatalities in 2013 was below the average in the previous decade. The 18 accidents in 2013 represent a decrease of 45% compared to the 33 accidents in 2012 and was 27% lower than the 10 year average over the period 2002-2011 of 24.6 accidents per year.

Table 1: Overview Of Total Number Of Accidents, Fatal Accidents And Fatalities For EASA MS Operators (Aeroplanes)

Period	Total number of accidents	Number of Fatal accidents	Number of Onboard Fatalities	Number of Ground Fatalities
2002-2011 (Average per Year)	24.6	2.3	59	0.2
2012	33	1	0	1
2013	18	0	0	0

Figure 13 shows that the low level of fatal accidents involving EASA MS operated aeroplanes has now been sus-

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

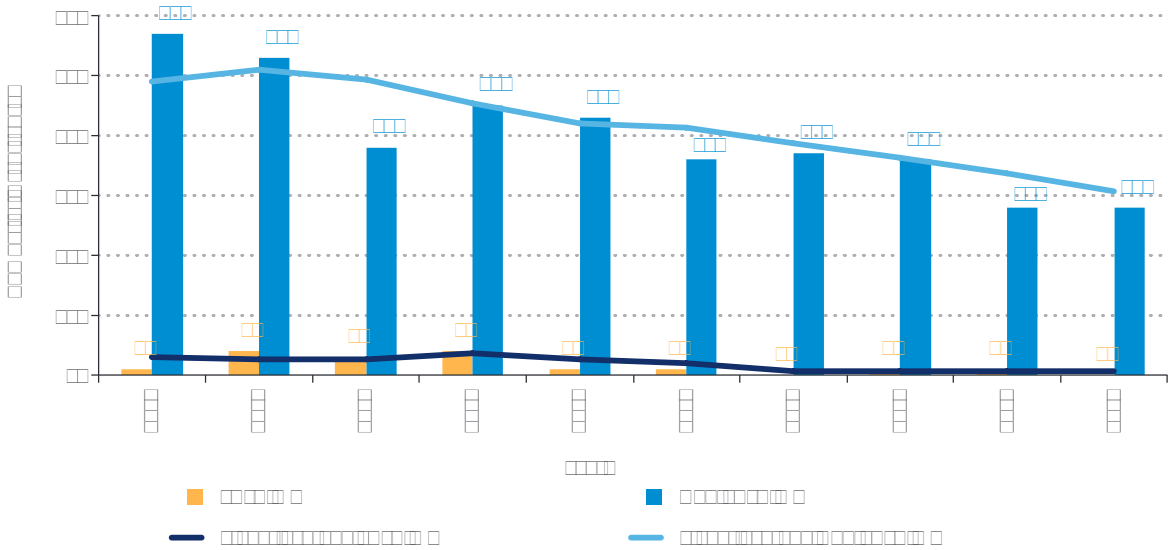
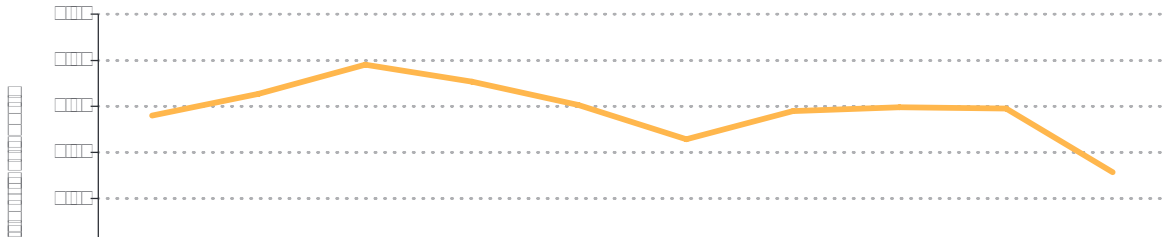


Figure 14 shows that the rate of fatal accidents for EASA MS Aeroplanes in scheduled passenger operations has remained at the same level for the past 4 years. With respect to Third-country Operators, 2013 has seen a reduction in the rate of fatal accidents compared with the previous 2 years. The rate for Third-country Operators in 2013 is also lower than the previously low rate in 2009.

Figure 14: Rate Of Fatal Accidents Per 10 Million Flights In Easa Ms And Third Country Operated Scheduled Passenger Operations, Aeroplanes Above 2250 Kg Mtom, 2004-2013



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.

Fatal Accidents by Mass Category

Figure 15 shows the distribution of fatal accidents by aircraft mass category (weight) for operators based in the EASA MS and for Third-Country operators over the period 2004-2013. For EASA MS operated aircraft it shows that 44% of the aircraft involved in fatal accidents were of a mass between 27,001 and 272,000 kg, 31% were between 5,701 kg and 27,000 kg, whilst 25% were between 2,251 and 5,700 kg. When compared with previous Annual Safety Reviews there has been an increase in the involvement of larger aircraft with a Mass Category between 27,001 and 272,000 kg and a corresponding decrease in fatal accidents involving smaller aircraft with a Mass Category between 5,701 kg and 27,000 kg. Figure 16 shows that the situation regarding third-country operated aircraft is slightly different with the largest proportion, 38%, involving aircraft between 2,251 kg and 5,700 kg. The majority of jet-powered aircraft belong to the mass category 27,001 kg to 272,000 kg, which accounted for 27% of the fatal accidents involving third-country-operated aircraft. 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, 2004-2013

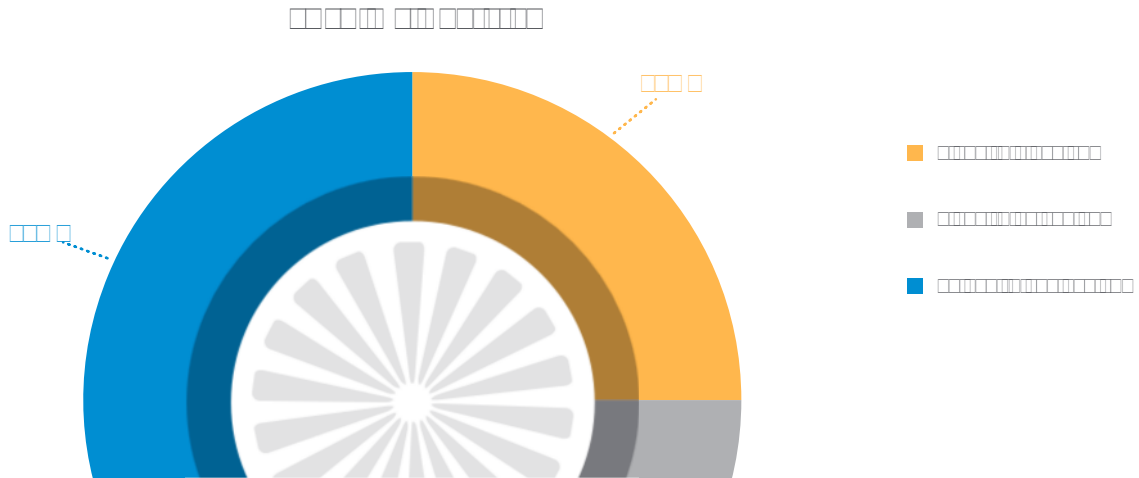
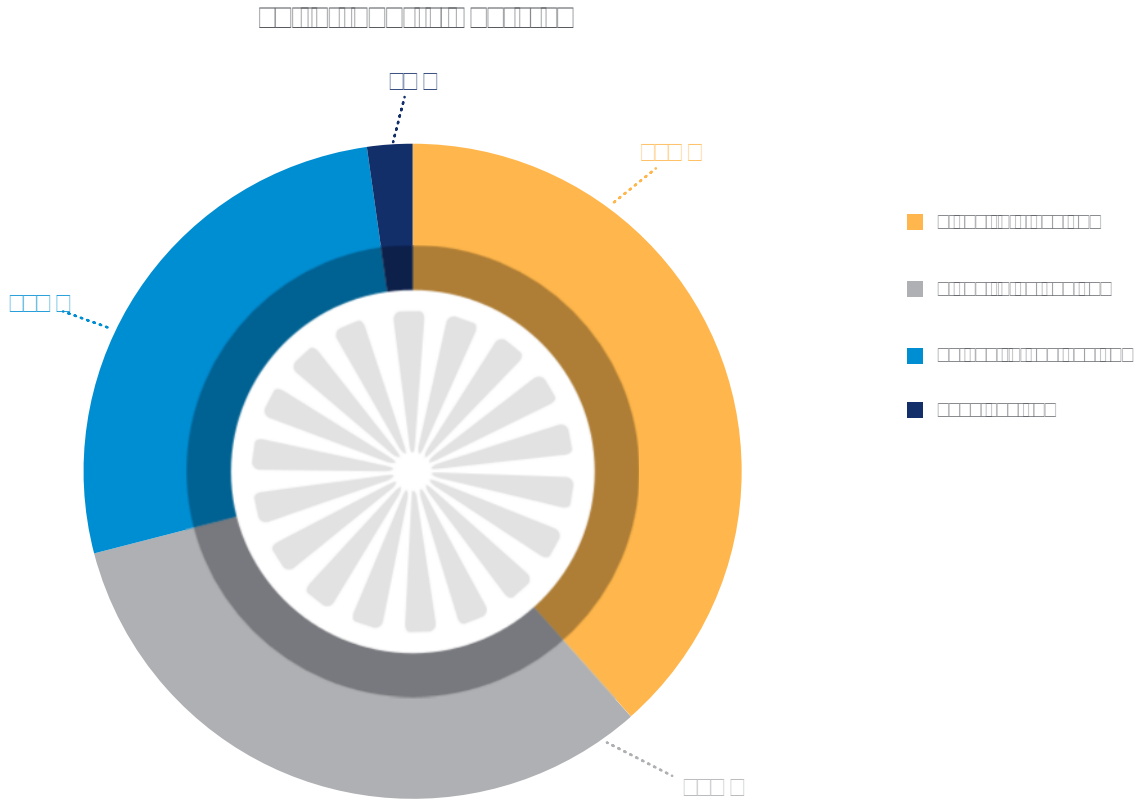


Figure 16: Proportion Of Fatal Accidents By Aircraft Mass Category, Third-Country Operated Cat Aeroplanes Above 2,250 Kg Mtom, 2004-2013



Occurrence Categories

The assignment of an accident under a single or multiple occurrence categories assists in the identification of particular safety issues. Occurrence 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

Figure 17: Occurrence Categories for Fatal and Non-Fatal Accidents Involving EASA MS Operated Aeroplanes (2004-2013)

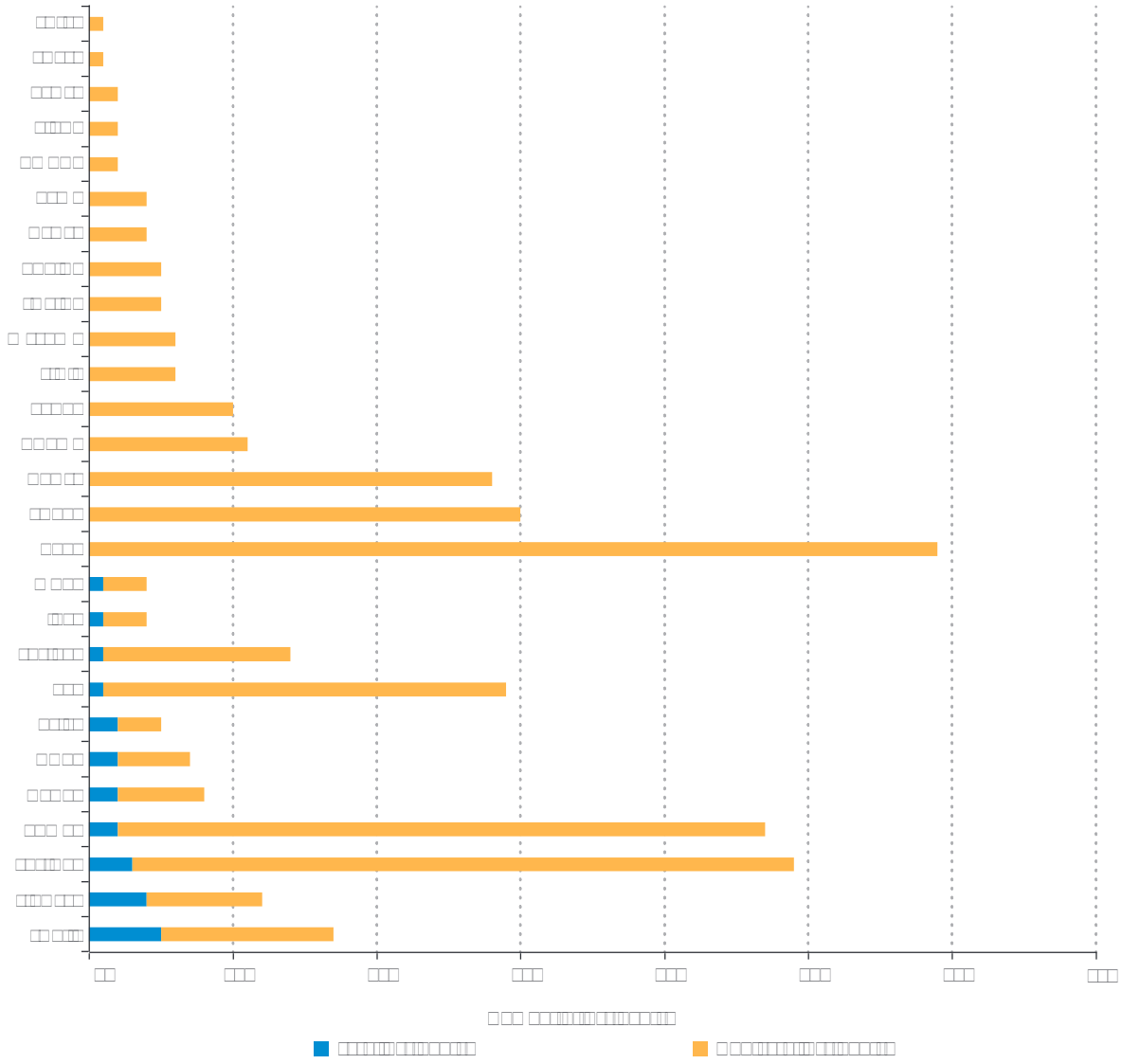


Table 2: Overview of Total Number of Accidents, Fatal Accidents and Fatalities for EASA MS Operated Helicopters, All Mass Categories

Period	Total number of accidents	Number of Fatal accidents	Number of Non-Fatal accidents	Number of Onboard Fatalities	Number of Ground Fatalities
2002-2011 (average)	12.8	3.4	9.4	14.1	0.1
2012	12	2	10	8	0
2013	7	3	4	10	1

Figure 18 compares the number of fatal accidents involving helicopters with a maximum take-off mass above 2,250 kg involving operators in EASA MS with accidents in other regions (third-country operators). All three fatal accidents in 2013 involving EASA MS operators concerned helicopters above 2,250 kg, thus increasing the 3-year average from 0.67 to 1.67 fatal accidents. The third-country operators experienced a reduction with only 6 fatal accidents in 2013, thus reducing their 3-year average to 8.33 – the lowest number in the past 10 years.

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

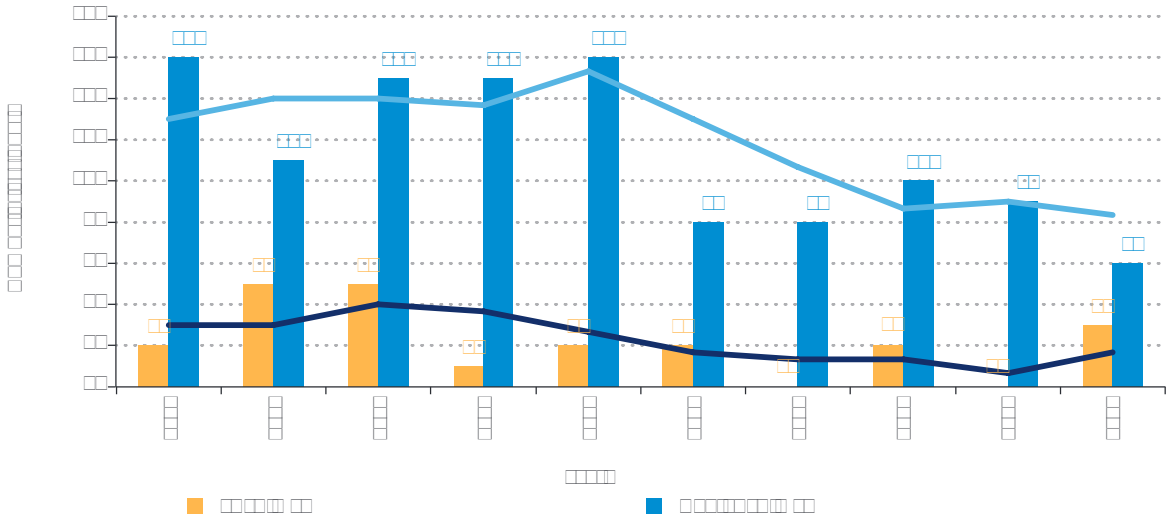
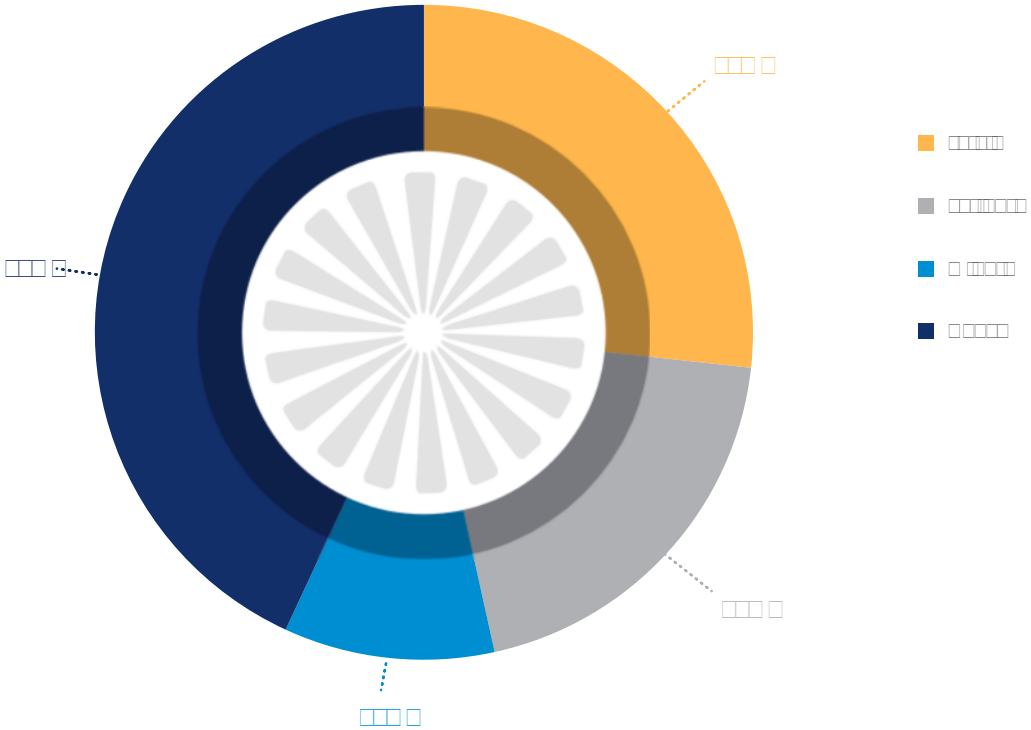


Figure 19 Proportion of Injury Levels for Accidents in–– EASA MS Operated CAT Helicopters, All Mass Categories, 2004-2013



Accidents by Operation Type

Figure 20 shows the number of accidents by operation type in the period 2004-2013. The category “Passenger” has been further broken down to include HEMS, Air Taxi and Sightseeing. Conventional Passenger operations has 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, 2004-2013

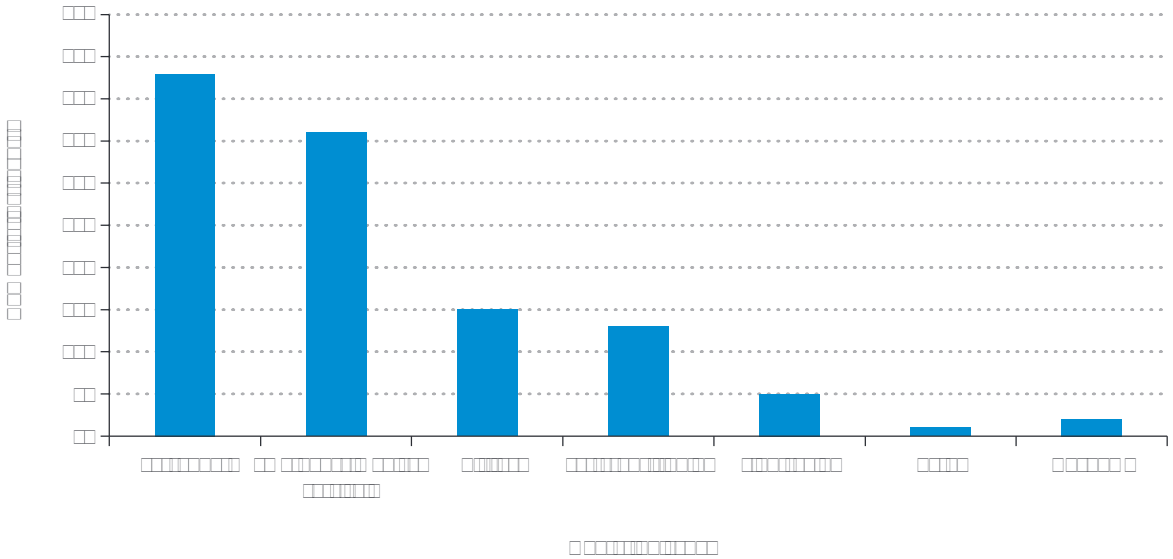


Figure 21 shows the number of fatal accidents and the number of fatalities in off-shore operations and non-off-shore operations during the period 2004-2013. 13% of fatal accidents and 23% of the total number of fatalities occurred in off-shore operations. In general, off-shore operations are carried out with large helicopters, which when an accident occurs could result in a larger number of casualties. Although off-shore helicopter operations have experienced fewer fatal accidents and fatalities, the ratio of fatalities to fatal accidents is higher for this type of helicopter operation (7.5 fatalities per fatal accident) than for non-offshore operations (3.8 fatalities per fatal accident).

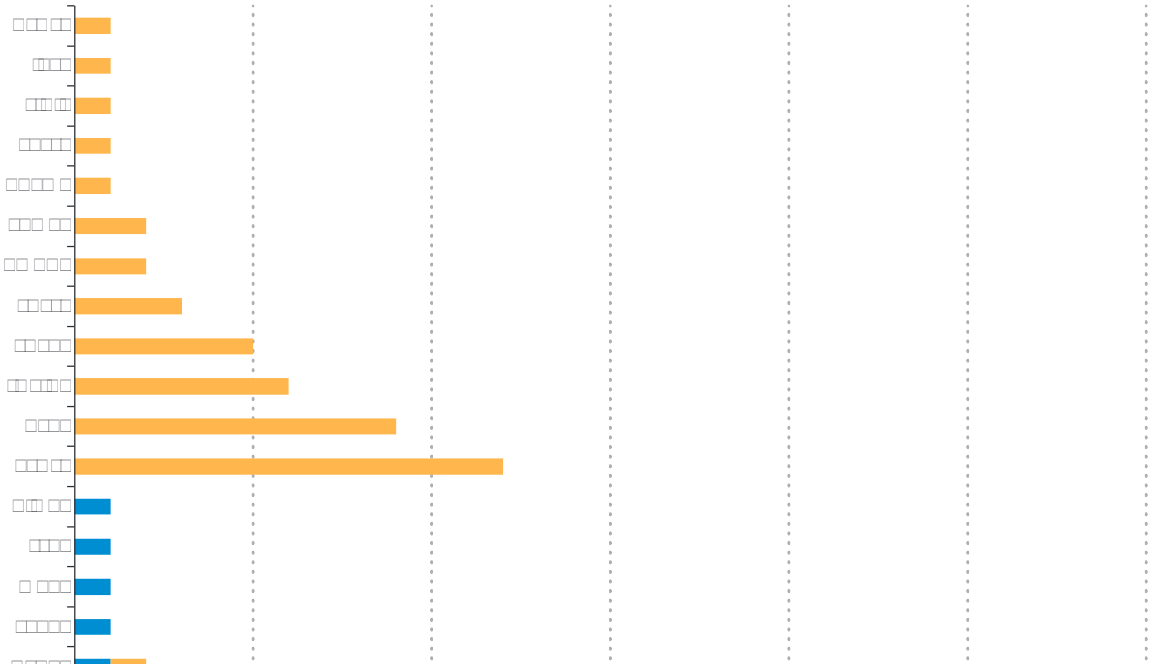
Figure 21: Proportion of Fatal Accidents and Fatalities in Off-Shore and Non Off-Shore Operations, EASA MS Operated CAT Helicopters, All Mass Categories, 2004-2013

Occurrence 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.

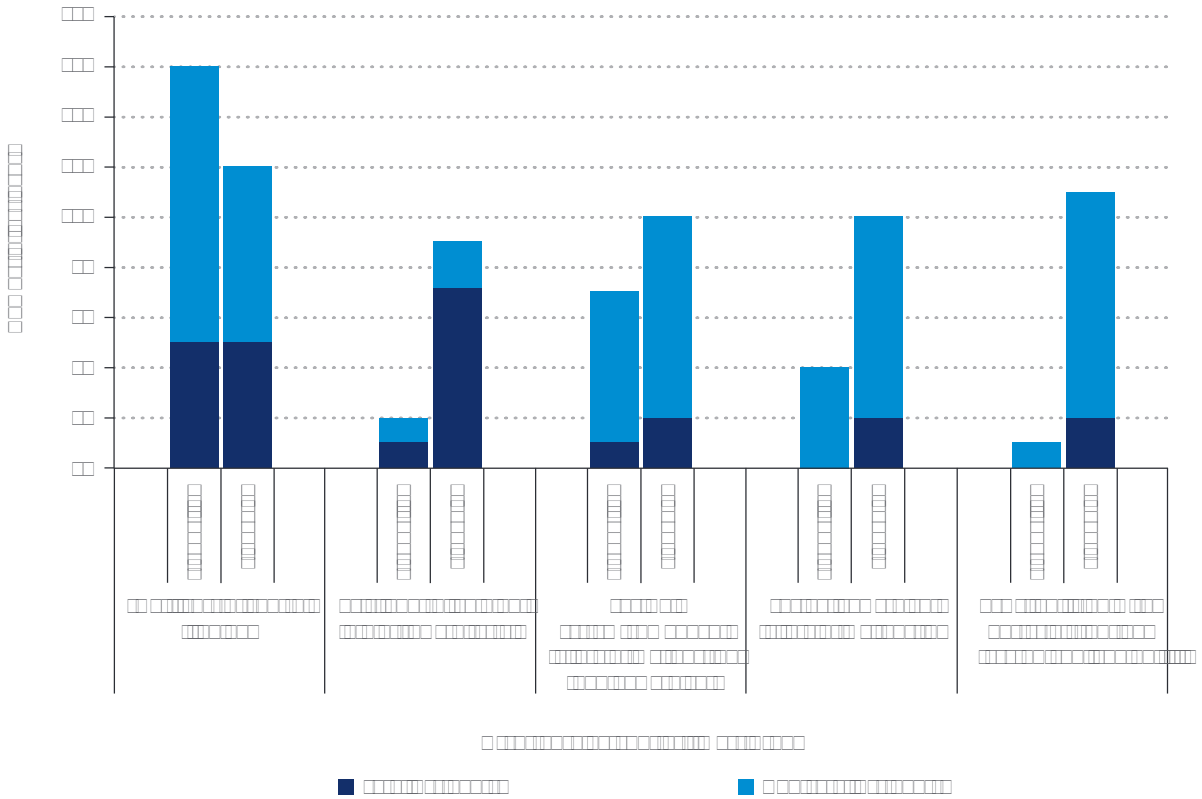
Figure 22 shows that the category with the highest number of accidents is Loss of Control - In Flight (LOC-I) followed by System/Component Failure or Malfunction – Non-Powerplant (SCF-NP) and System/Component Failure or Malfunction – Powerplant (SCF-PP). The category of SCF-NP includes accidents related 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 aircraft operate in confined areas close to obstacles. The highest number of fatal accidents involved the occurrence categories LOC-I, CFIT, LALT and F-POST.

Figure 22 Occurrence Categories for Fatal and Non-Fatal Accidents EASA MS Operated CAT Helicopters, All Mass Categories, 2004-2013



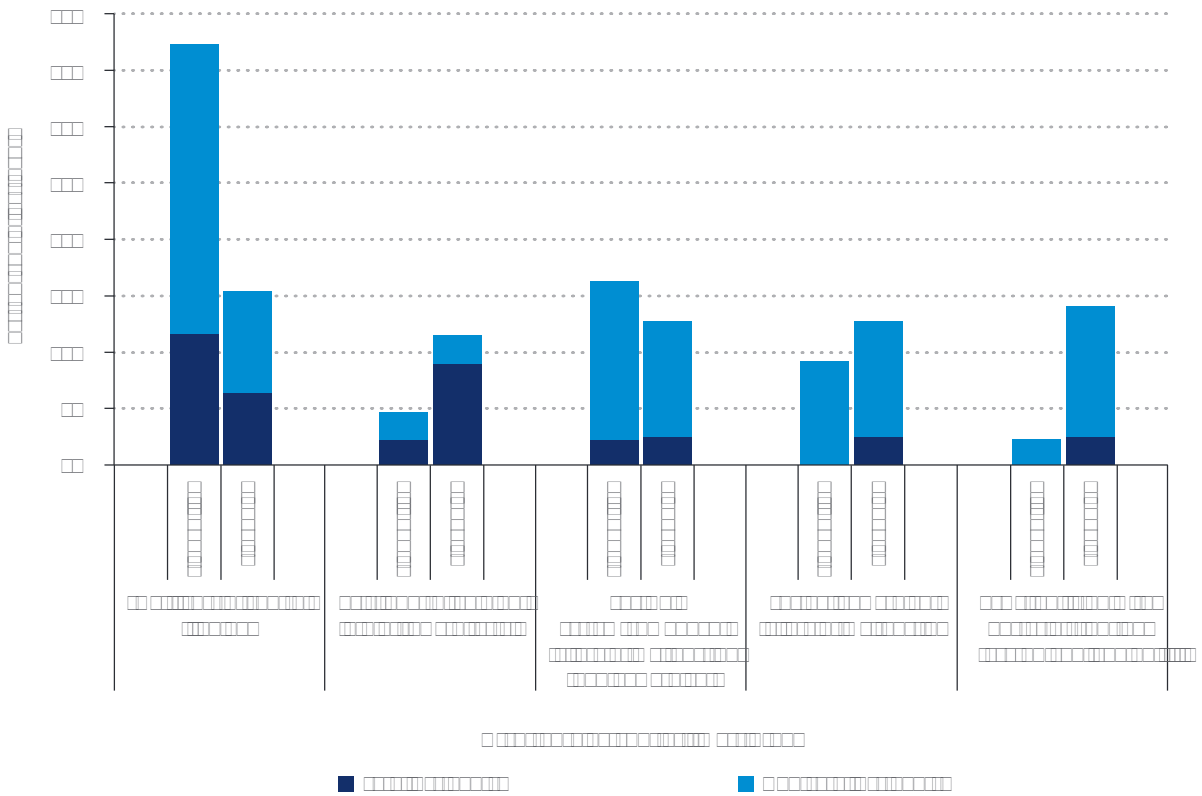
Concerning the 5 occurrence categories with the highest total number of accidents, Figure 23 shows the number of accidents for light (MTOM 0-2,250 kg) and heavy (MTOM above 2,250 kg) helicopters. It is only with respect to LOC-I that the number of accidents is higher for the light helicopters, in the other 4 categories there is 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, 2004-2013



The total number of accidents per mass group differs, and in Figure 24 the percentages are derived by dividing the number of accidents per category per mass group by the total number of accidents for each mass group.

Figure 24: Top 5 Occurrence Categories Fatal/Non-Fatal Accidents percentages Light/Heavy Helicopters 2004-2013



Balloons

This section reviews CAT accidents involving balloons. Between 2009 and 2013, there were 54 balloon accidents. 4 accidents were fatal, of which 1 occurred in 2013. Figure 25 shows the number of accidents per year for balloon CAT.

Introduction

This chapter covers accidents that 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

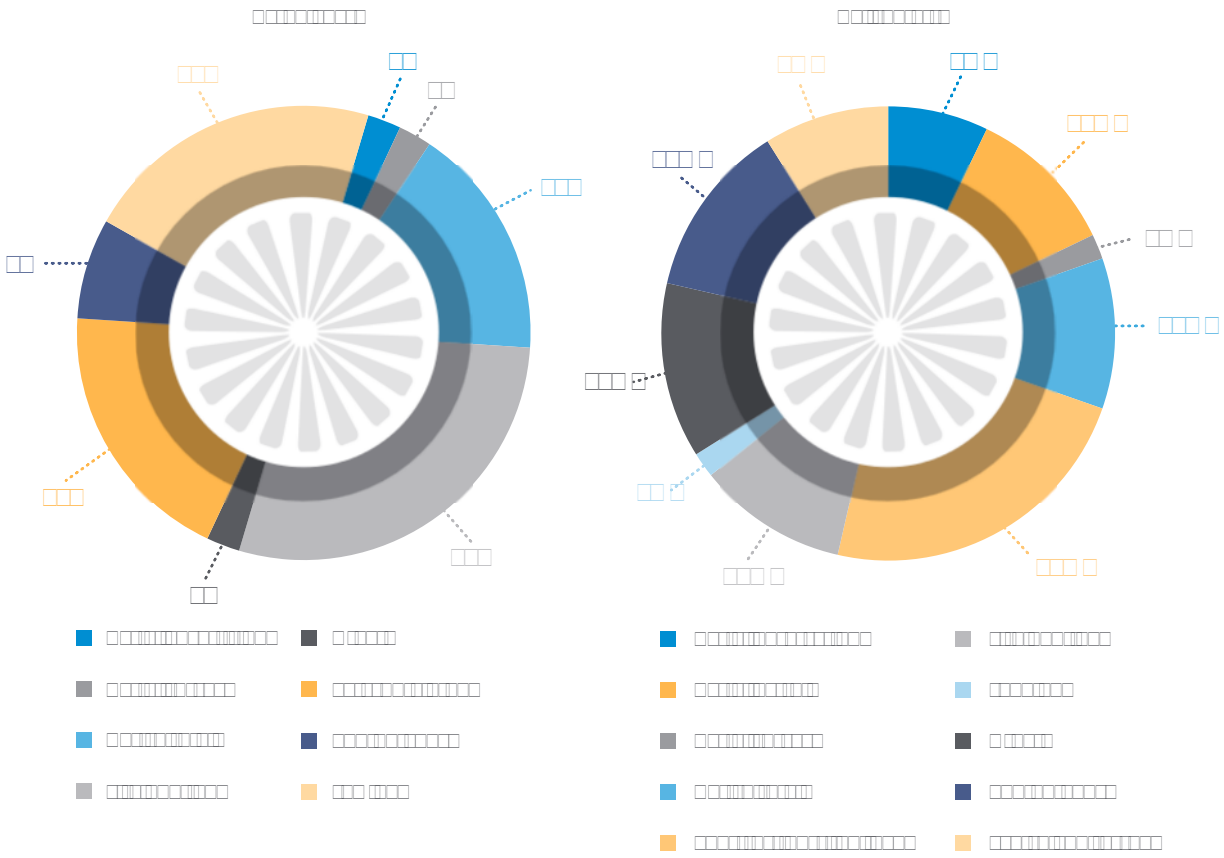
In Table 3 the time period presented extends from 2002–2013, showing the number of accidents in 2012 and 2013 as well as the average for the decade preceding these years.

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	2002-2011 (average per year)	23.9	4.6	7.9	0
	2012	35	5	12	0
	2013	21	3	13	0
Helicopters	2002-2011 (average per year)	28.9	5.1	9.2	1.4
	2012	32	8	12	0
	2013	22	5	12	0

Figure 26 shows the distribution of fatal accidents by operation type between aeroplanes and helicopters for the decade 2004 to 2013. For aeroplanes, the Top 3 operation types in fatal accidents involved fire-fighting, aerial survey and photography operations. Whilst for helicopters the Top 3 were construction, other and photography operations.

Figure 26: Fatal Accidents by Aircraft Category and Operation Type in Aerial Work, All Mass Categories, 2004 – 2013



Occurrence 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 27 describes aeroplane accidents in Aerial Work per occurrence category. It must be noted that more

Figure 27: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered Aerial Work Aeroplanes, 2004-2013

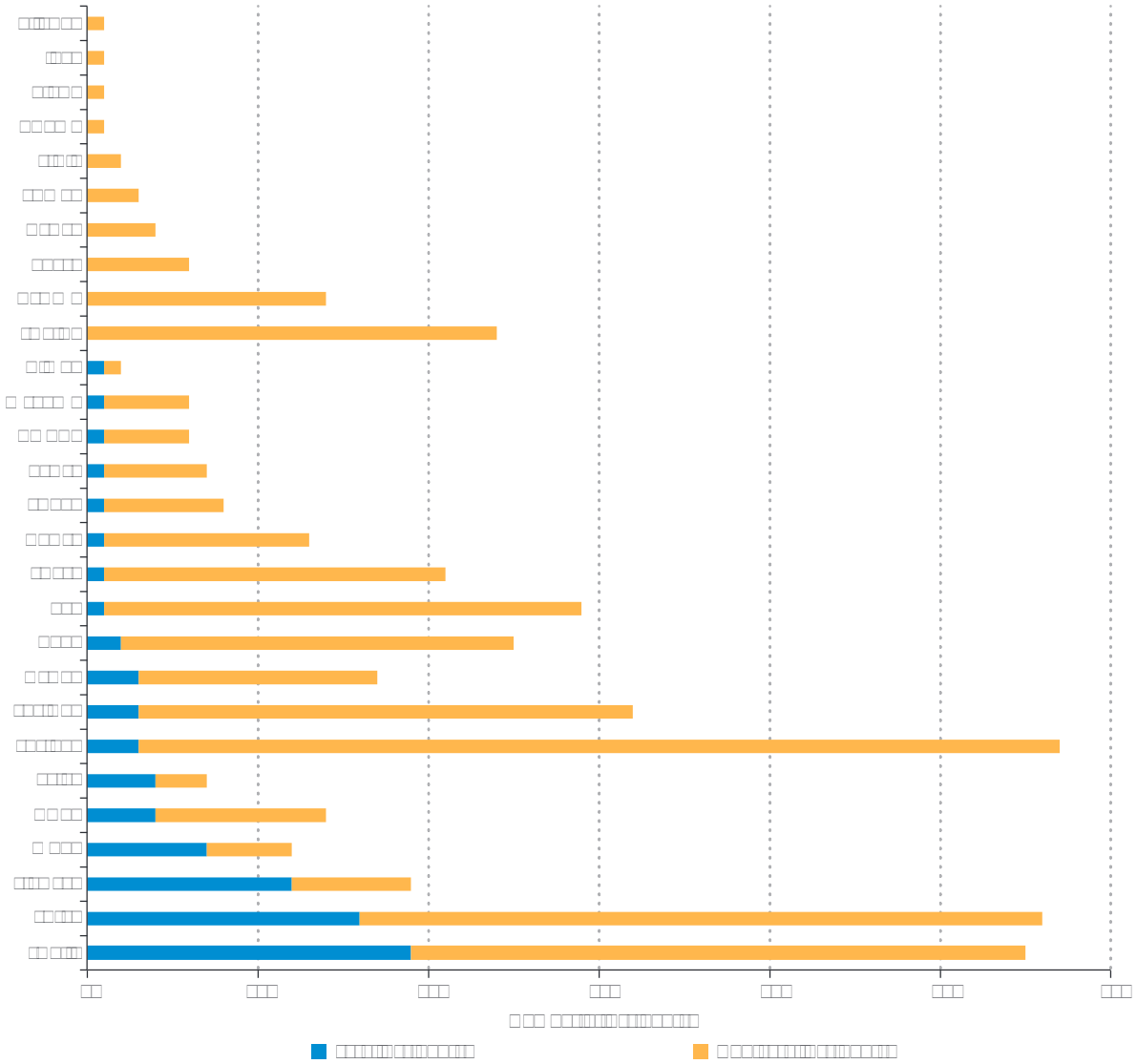
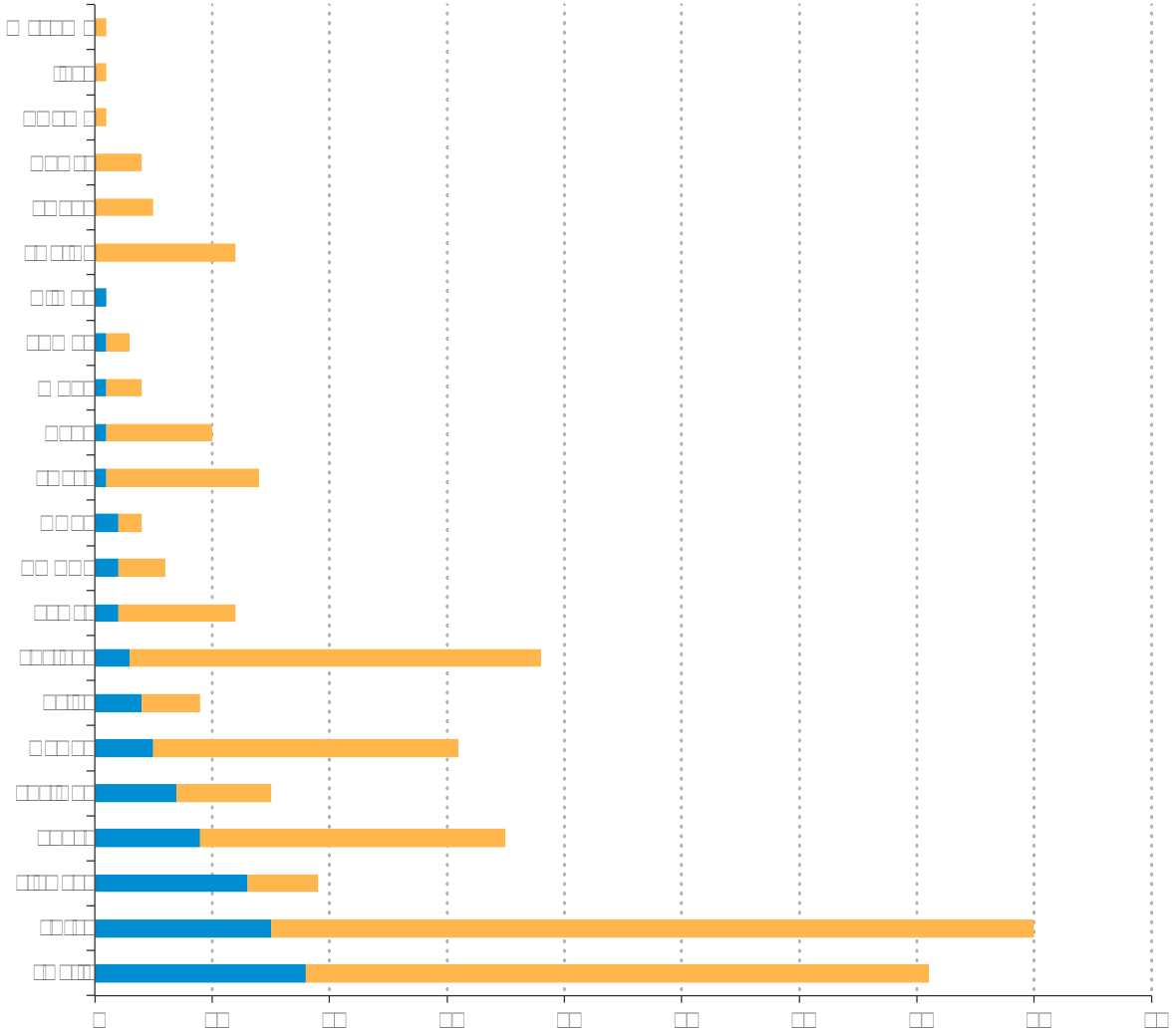


Figure 28 shows that LOC-I and LALT are the most common causes both for fatal and non-fatal helicopter accidents in EASA MS Registered Aerial Work Helicopters, during the period 2004-2013.

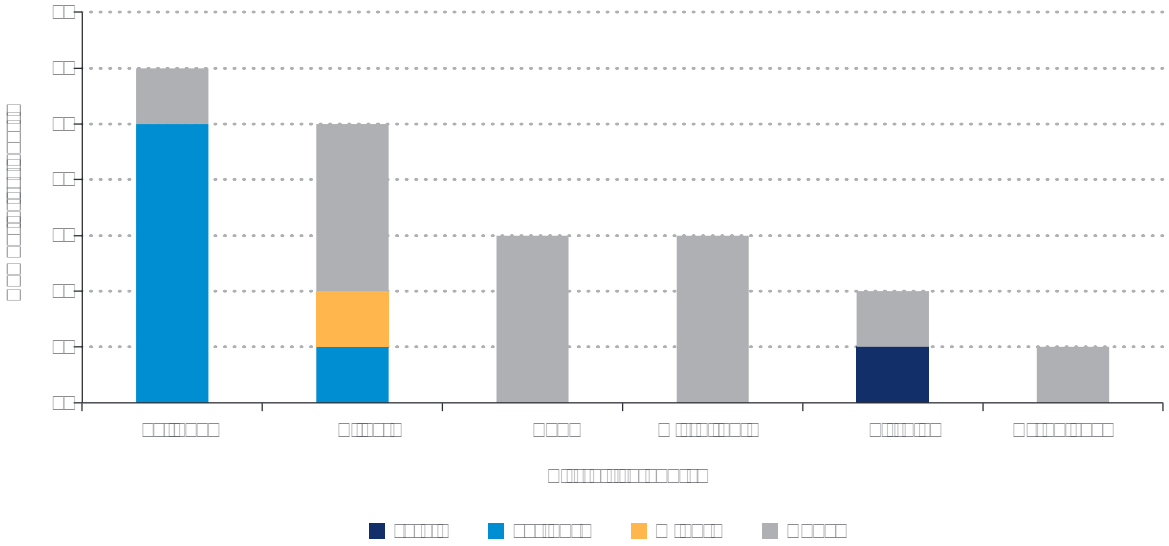
Figure 28: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered Aerial Work Helicopters, 2004-2013



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 29, a total of 20 such accidents have occurred, of which Balloons (6) and Gliders (5) are the most affected aircraft categories.

Figure 29: Aerial Work Accidents by Aircraft Category and Injury Level, Involving Aircraft other than Aeroplanes or Helicopters, EASA MS State Registered, 2004-2013



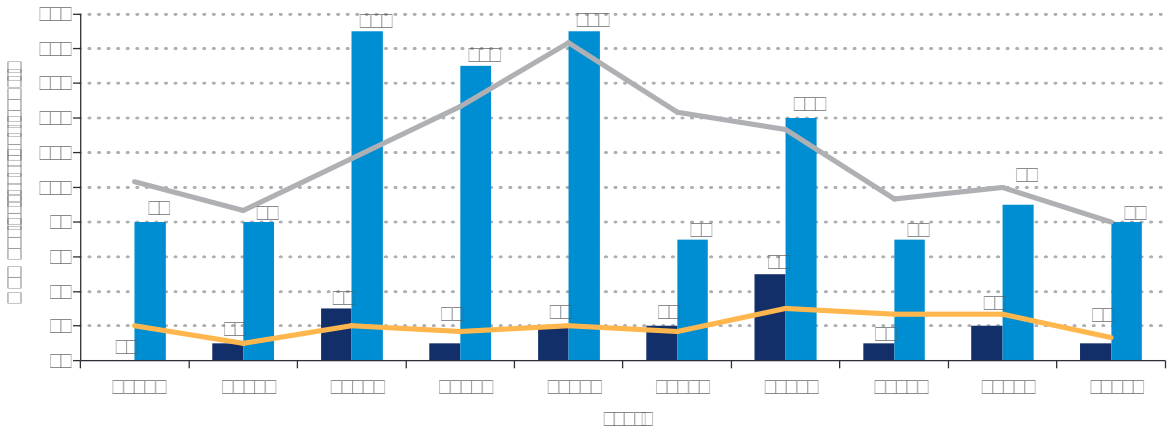
Introduction

This chapter covers accidents that involved aircraft of all mass categories in General Aviation operations. General Aviation is defined here as being all civil aviation operations other than Commercial Air Transport or a specific type of 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. Figure 30 shows that the number of accidents per year involving EASA MS registered business flights has ranged between 0 and 5, an average of 1.8 per year.

Figure 30: Number of Fatal Accidents in EASA MS and Third-country Registered Business Aviation Aeroplanes, 2004-2013



General Aviation Accidents Above 2,250 kg MTOM

This section reviews accidents involving General Aviation aircraft with a MTOM above 2,250 kg. The data set refers to aeroplanes and helicopters only. Therefore no figures are presented for other aircraft categories.

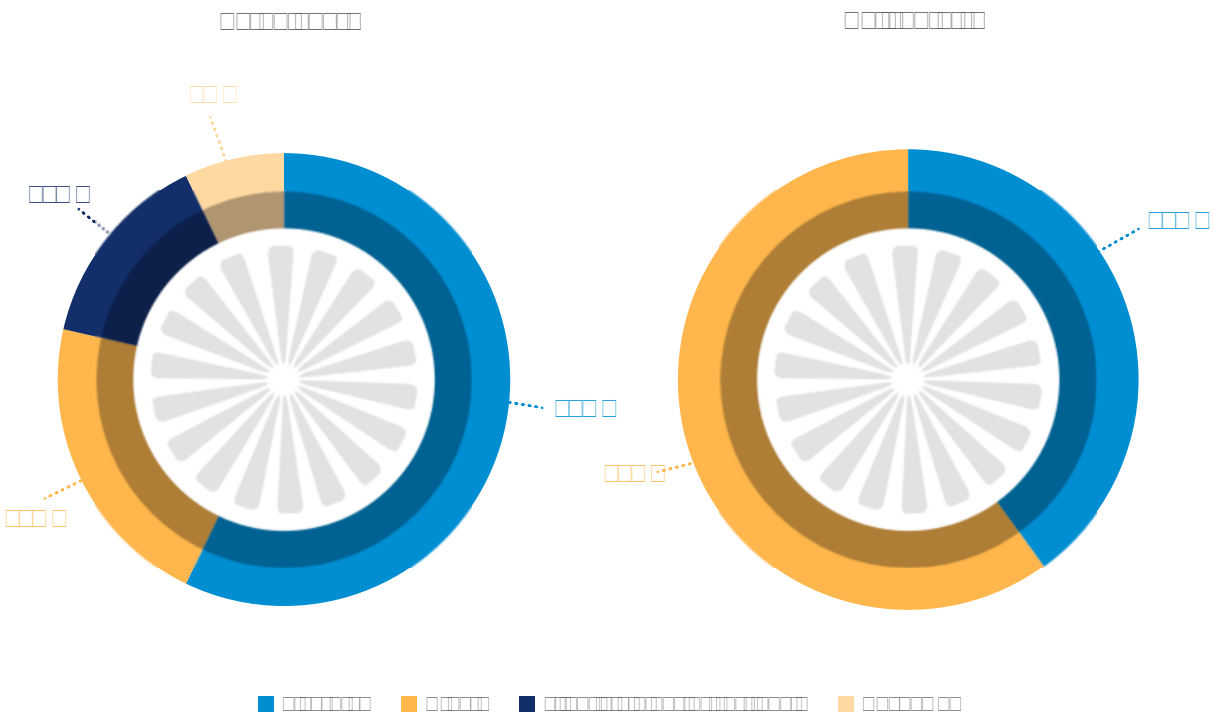
In Table 4 the time period presented extends from 2002–2013, showing the number of accidents in 2012 and 2013 as well as the average for the decade preceding these years.

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	2002-2011 (average per year)	9.6	3.3	8.3	0.0
	2012	9	2	2	1
	2013	11	3	7	0
Helicopters	2002-2011 (average per year)	2.0	1.0	3.7	0.0
	2012	1	0	0	0
	2013	4	0	0	0

Figure 31 shows the distribution of fatal accidents by aircraft category and operation type for the period 2009-2013.

Figure 31: Proportion of Fatal Accidents by Aircraft Category and Operation Type, in General Aviation Aircraft Above 2,250 kg MTOM 2009 – 2013



Occurrence 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 32 shows that "Loss of Control – In-Flight" (LOC-I) is the category with the highest number of fatal accidents. Investigations conducted in several of these accidents were unable to determine all the causes that led to the loss of control. F-POST or 'post impact fire' is often associated with LOC-I or "Controlled Flight into Terrain" (CFIT). There are several fatal accidents with the occurrence category "Unknown"(UNK), indicating that there were insufficient data to permit classification of these accidents. "Abnormal Runway Contact" (ARC) often pre-

Figure 32: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered General Aviation Aeroplanes above 2,250 kg MTOM, 2009-2013

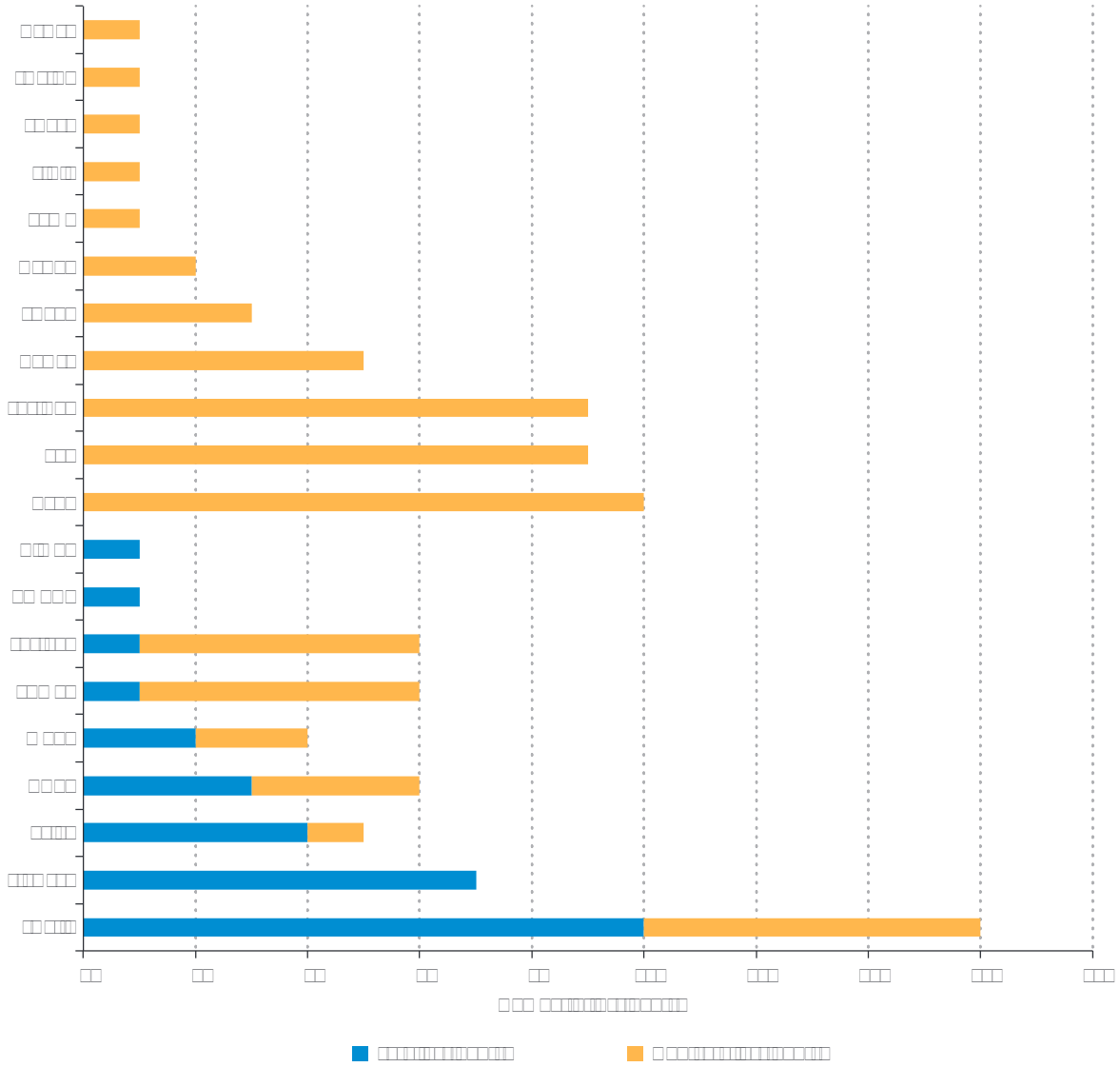
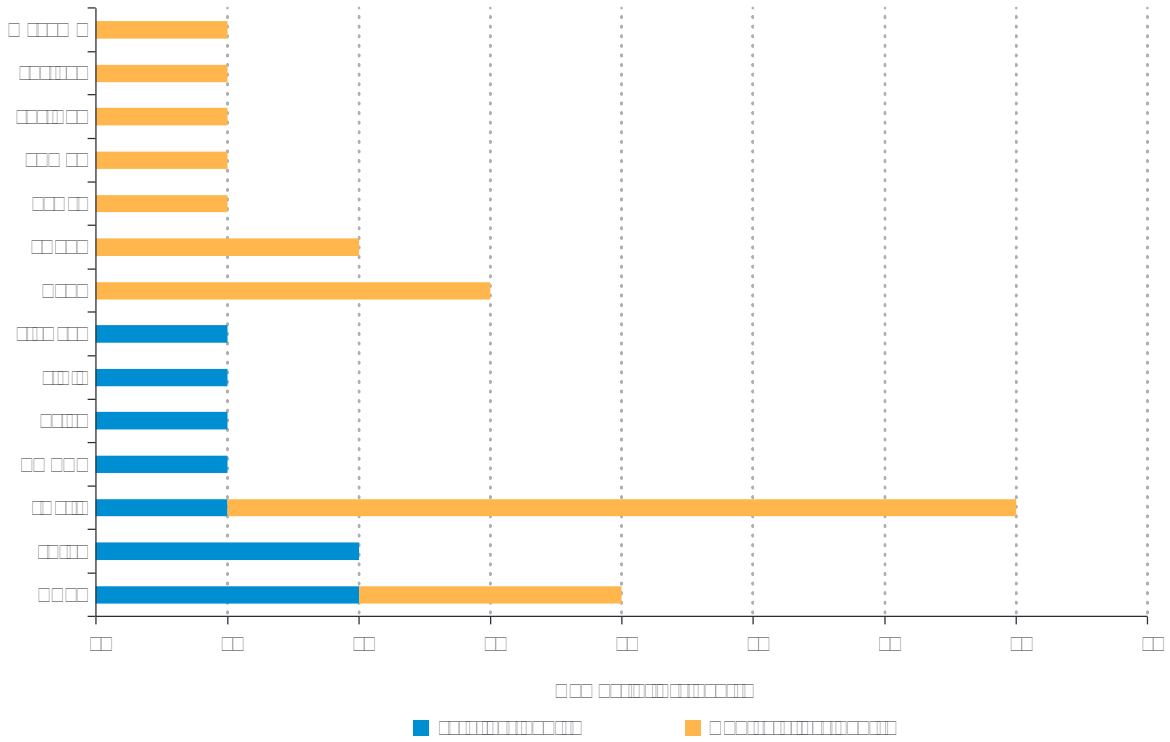


Figure 33: Occurrence Categories for Fatal and Non-Fatal Accidents in EASA MS Registered General Aviation Helicopters above 2,250 kg MTOM, 2009-2013



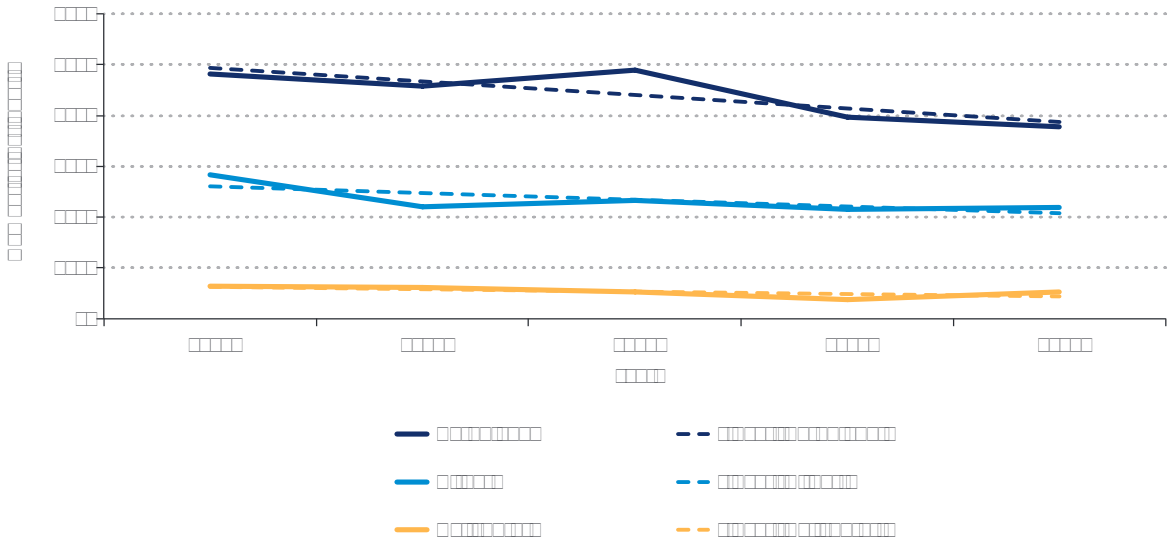
General Aviation Accidents Below 2,250 kg MTOM

Data for accidents involving aircraft not exceeding 2,250 kg MTOM were 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 provided and all but one of the EASA MS provided the data in an ECCAIRS format. For the year 2013, two States; Liechtenstein and Cyprus, reported zero accidents in their territory. Together, France, Germany and the UK reported 61% of all the accidents in 2013. It should be noted that the actual number of accidents may differ, as some recent accidents are possibly missing from the da-

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	2008-2012 (average per year)	11.6	1.0	2.2	0.0
	2013	16	1	1	0
Dirigibles	2008-2012 (average per year)	0.0	0.0	0.0	0.0
	2012	0	0	0	0
Aeroplanes	2008-2012 (average per year)	478.2	62.8	123.8	1.4
	2013	378	42	82	0
Gliders	2008-2012 (average per year)	244.2	31.2	38.8	0.2
	2013	219	20	27	0
Gyroplanes	2008-2012 (average per year)	18.6	4.4	5.4	0.2
	2013	17	6	8	0
Helicopters	2008-2012 (average per year)	54.8	7.8	16.0	0.2
	2013	52	9	16	0
Microlights	2008-2012 (average per year)	234.6	42.6	64.4	0.2
	2013	219	40	57	0
Other	2008-2012 (average per year)	10	3.2	3.8	0.0
	2013	30	9	10	0
Motorgliders	2008-2012 (average per year)	2.0	0.2	0.4	0.0
	2013	17	1	1	0
Average Total	**2008-2012**	**1054**	**153**	**255**	**2**
Total	2013	**948**	**128**	**202**	**0**
Change (%)	**2013 over previous**	**-10%**	**-16%**	**-21%**	**-100%**

Figure 34: Number of Accidents per year, by Aircraft Category involving General Aviation Aircraft Below 2,250 kg MTOM 2009-2013



Fatal Accidents

Figure 35 shows the distribution of fatal accidents by aircraft category. 38 % of all light aircraft involved in fatal accidents between 2009 and 2013 were aeroplanes. Microlight aircraft were involved in 28%, followed by gliders with 20%.

Figure 35: Proportion of Fatal Accidents by Aircraft Category, Involving EASA MS General Aviation Aircraft Below 2,250 kg, 2009 – 2013

Occurrence 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.

Historically, the occurrence categories have been developed to permit the tractability of safety efforts aimed at fixed wing air transport operations. Additional categories, more appropriate to 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 and is shown in Figure 36, however it is recognised that the accident categories are more correctly represented when defined by the aircraft category (e.g. aeroplanes, helicopters and gliders). It should be noted that the following graphs show the total number of accidents whereas in the ASRs of 2011 and earlier these graphs were represented as an average number of accidents per year.

Figure 36: Occurrence Categories for Fatal and Non-Fatal Accidents - EASA MS Registered General Aviation Aircraft Below 2,250 kg MTOM, 2009-2013

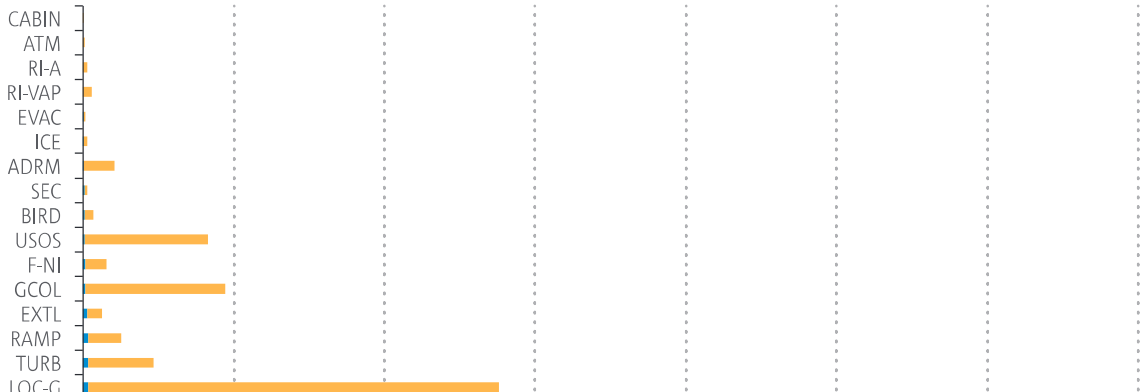


Figure 37 shows that the category assigned most frequently to fatal accidents involving aeroplanes was Loss of Control - In Flight (LOC-I). This is followed by Fire/Smoke - Post-Impact (F-POST), Controlled Flight Into Terrain (CFIT) and Low Altitude Operations (LALT). Due to the possible assignment of one or multiple occurrence categories to accidents involving light aircraft the aforementioned categories 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 newer 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 Aeroplanes Below 2,250 kg MTOM, 2009-2013

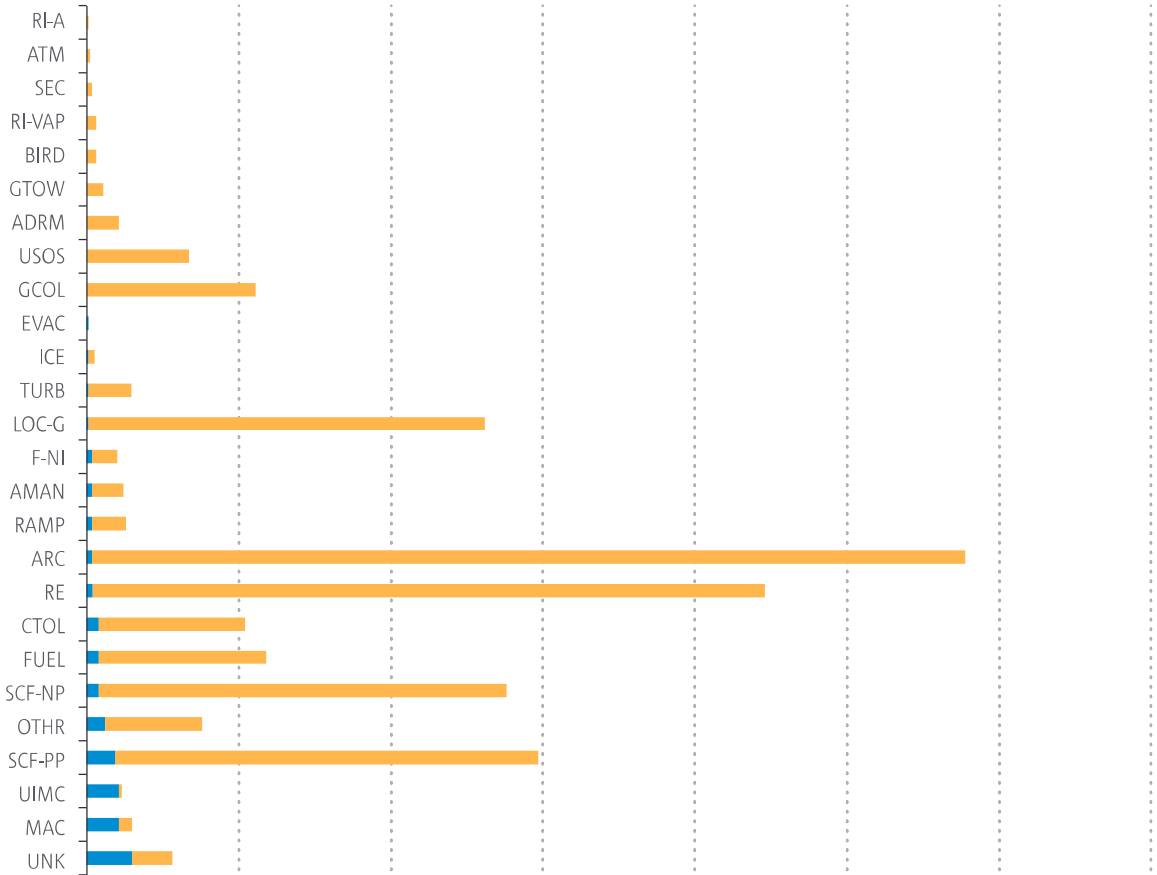


Figure 38 shows that for helicopters LOC-I is the most important category, in terms of fatal accidents but also as the most frequent cause of non-fatal accidents. The second most important is SCF-PP and the third is LALT. Note that F-POST is assigned when fire occurs at or after impact.

Figure 38: Occurrence Categories for Fatal and Non-Fatal Accidents - EASA MS Registered General Aviation Helicopters Below 2,250 kg MTOM, 2009-2013

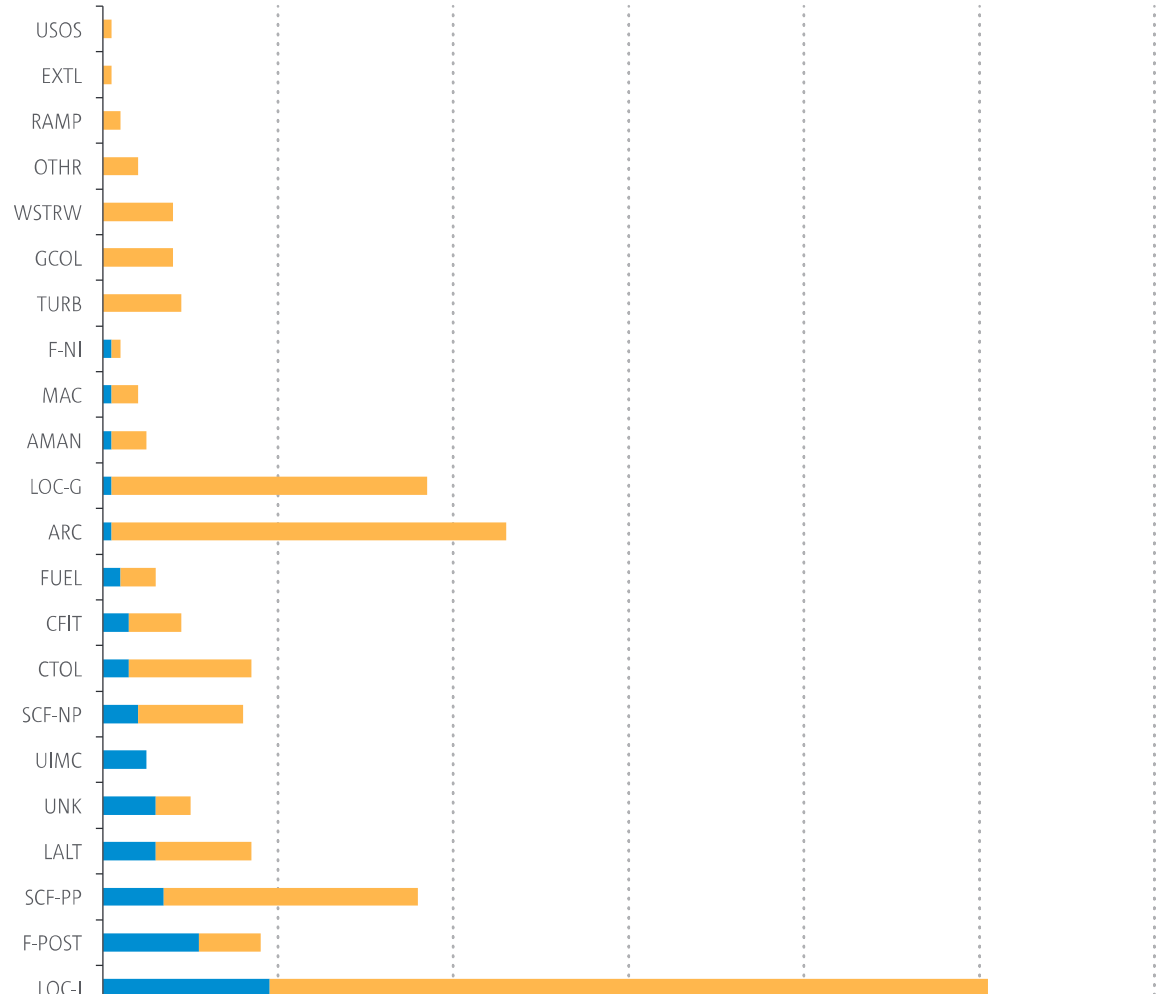
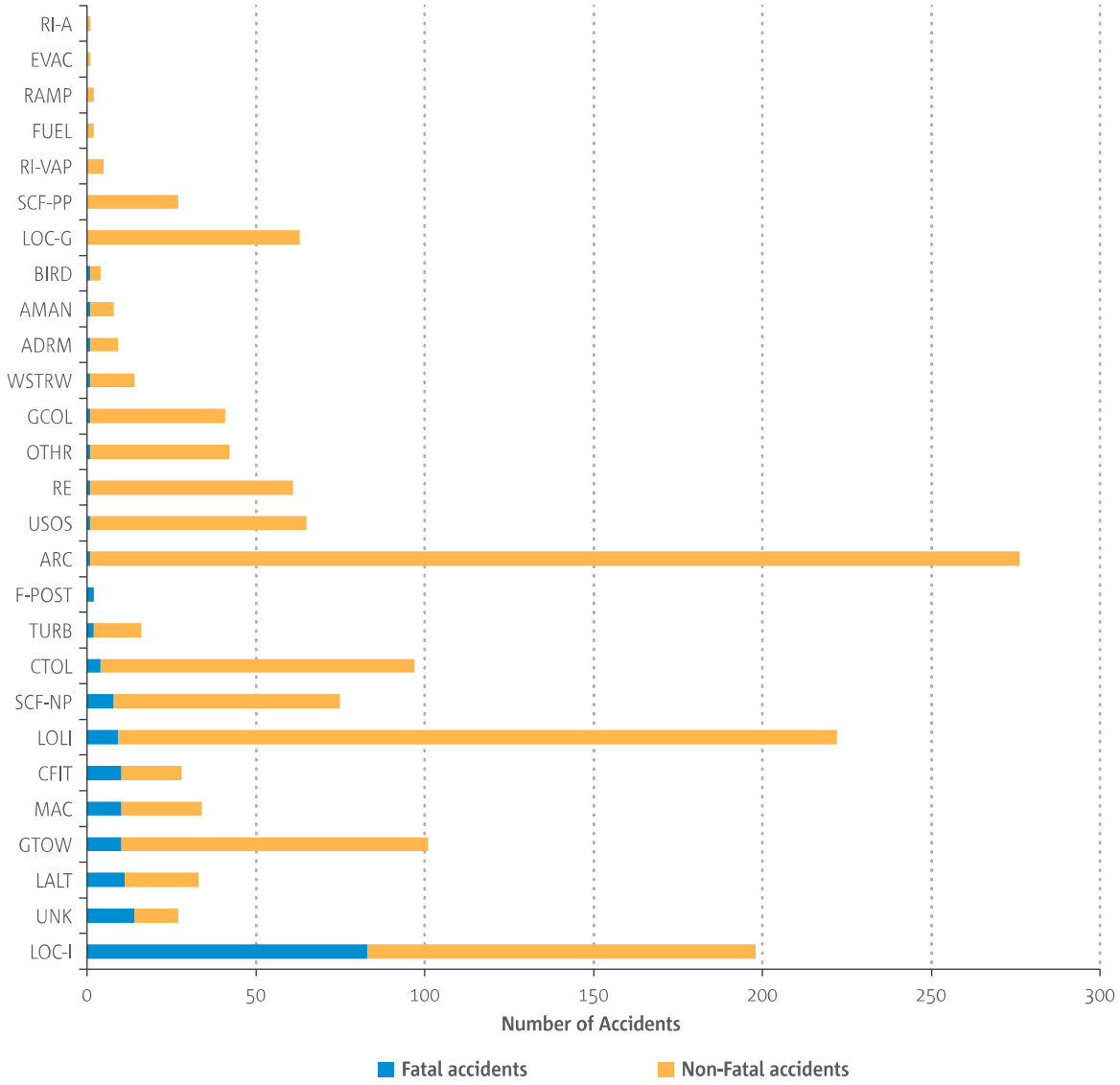


Figure 39: Occurrence Categories for Fatal and Non-Fatal Accidents - EASA MS Registered General Aviation Gliders Below 2,250 kg MTOM, 2009-2013



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. Please note that data relating to Runway Incursions are presented in Chapter 8 – Air Traffic Management. The time period covered in this chapter is 2009-2013.

The aerodromes included in this chapter are those that meet all of the following criteria:

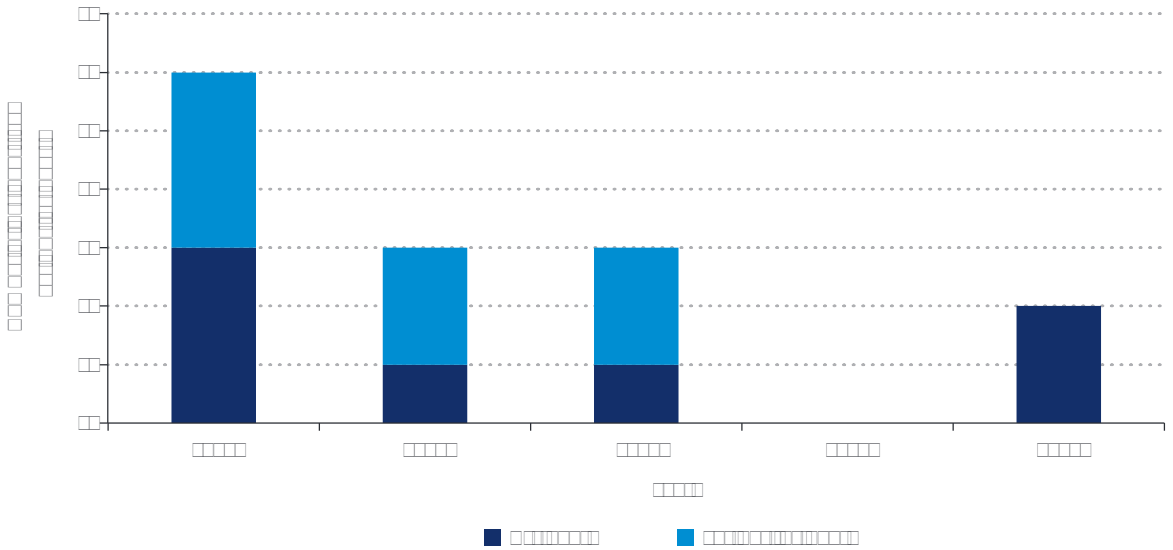
- Open to public use;
- Serve commercial air transport;
- Provide instrument approach or departure procedures;
- Have a paved runway of 800 metres or above or exclusively serve helicopters.

Aerodrome Accidents and Serious Incidents

Aerodrome accidents and serious incidents are defined as those involving 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. These accidents are assigned the occurrence category ADRM; examples include aerodrome lighting failures, ambiguous or incorrect signage and the effects of aerodrome design.

In the period 2009–2013 there were 14 accidents and serious incidents within the occurrence category ADRM. Figure 40 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. Consequently this data should be considered as preliminary only.

Figure 40: Number of Accidents and Serious Incidents per Year Involving EASA MS Aerodromes Occurrences, 2009-2013



Occurrence Categories

In order to assist in the identification of particular safety issues, one or multiple occurrence categories were assigned to accidents and serious incidents involving Aerodromes. The occurrence categories (in addition to ADRM) assigned to aerodrome accidents and serious incidents are shown in Figure 41. It can be seen that Runway Excursion (RE) is the most common occurrence category to be assigned. The positioning of System Component Failure – Power Plant (SCF-PP) in aerodromes occurrences is due to one bird strike and one case of FOD ingestion, both causing engine failure. 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. As a result all engine failures have had the SCF-PP code applied.

Figure 41: Occurrence Categories Assigned Alongside the Aerodrome Occurrence Category, Involving EASA Aerodromes Accidents and Serious Incidents, 2009-2013

Runway Excursions

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

In total, there were 132 runway excursion accidents and serious incidents at EASA aerodromes between 2009 and 2013 with 32 of these occurring in 2013. Figure 42 shows the total number of runway excursions per year, broken down by occurrence class. Please note that unlike Figure 41, Figure 42 includes Runway Excursions where the Aerodrome occurrence category has not been assigned. It can be assumed then that the Runway Excursion did not relate to the aerodrome but more probably to factors involving aircraft operation or air traffic control.

Figure 42: Number of Runway Excursion Accidents and Serious Incidents per Year at EASA Aerodromes, 2009-2013

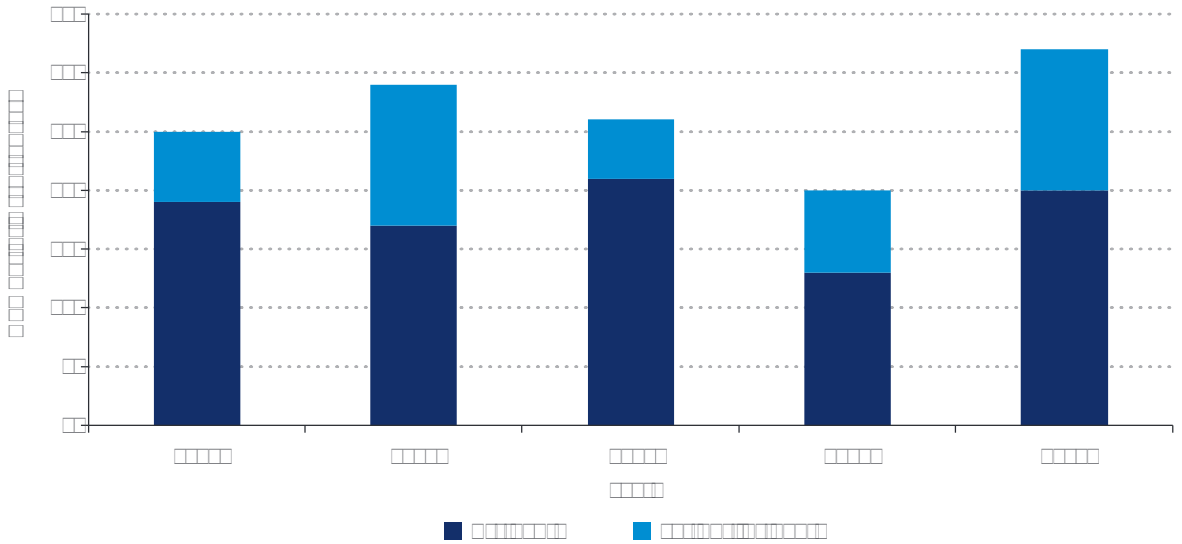
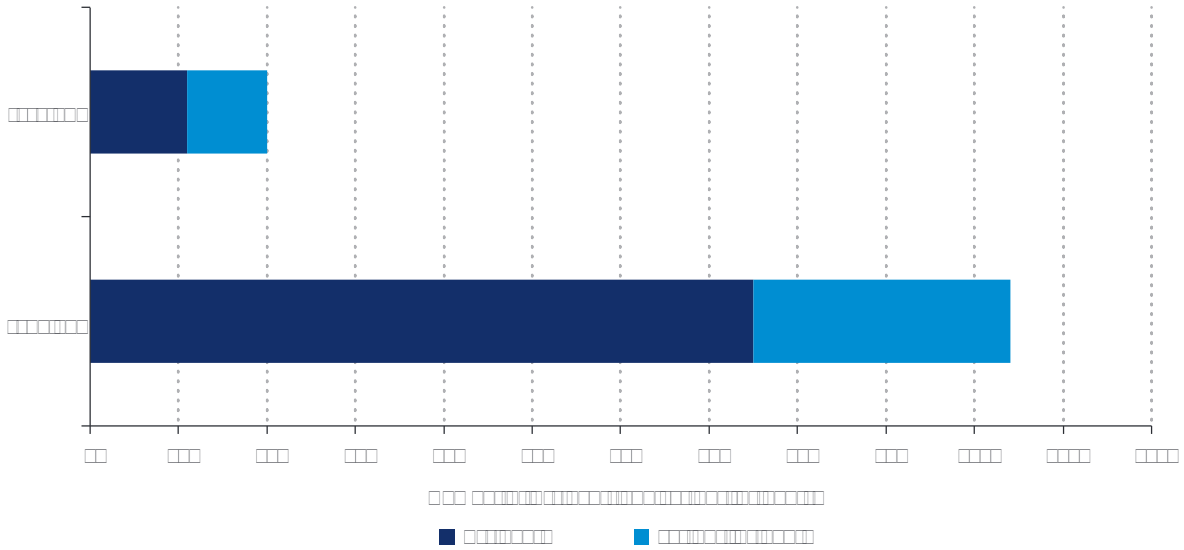


Figure 43: Number of Runway Excursions at EASA Aerodromes By Phase of Flight, 2009-2013



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 the key operational safety risks for commercial air transport aircraft. The number of ground collisions per year at EASA MS aerodromes is shown in Figure 44. Figures for ground collisions involving CAT aeroplanes are shown in Chapter 4, while figures for ground collisions at EASA MS aerodromes are shown here.

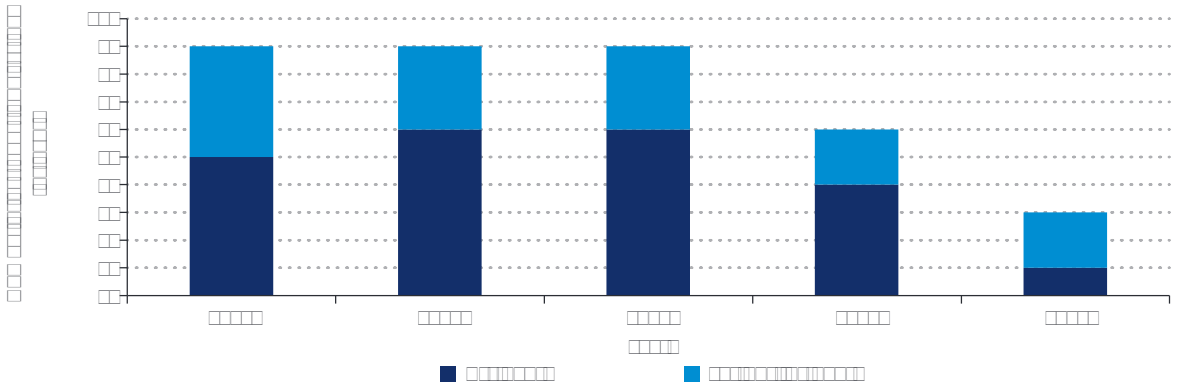
In total, there were 34 ground collision accidents and serious incidents at EASA MS aerodromes between 2009 and 2013. 8 of these occurred in 2013.

Figure 44: Number of Ground Collision Accidents and Serious Incidents per Year at EASA

Ramp Accidents and Serious Incidents

The ramp environment can be considered as to be distinct from the rest of the aerodrome environment. Ramp events are those that occur during or as a result of ground handling operations. Examples in this category include but are not limited to loading, pushback, refuelling or de-icing errors. The number of ramp accidents and serious incidents is shown in Figure 45. The most common types of ramp accident and serious incident involved collisions with another aircraft, with ground objects, and with vehicle/equipment operations. Two of the ramp accidents included in this chapter were fatal. One resulted in a baggage handler being killed while loading the aircraft, the other fatality occurred when a portable water truck collided with the wingtip of an aeroplane, killing the truck driver. Both of these accidents occurred in 2012.

Figure 45: Number of Ramp Accidents and Serious Incidents per Year at EASA Aerodromes, 2009-2013



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 MS aerodromes is shown in Figure 46.

Introduction

The Air Traffic Management (ATM) [1] system comprises of airborne and ground-based functions (air traffic services, airspace management and air traffic flow control management) to ensure the safe and efficient movement of aircraft during all phases of flight operations. The provision of safe Air Traffic Services, as part of the ATM system in a pan-European environment, taking into account future aviation developments such as SESAR deployments, continues to be one of the main objectives of Member States and Air Navigation Service Providers. For the fourth year, a specific Chapter on ATM has been incorporated in the EASA Annual Safety Review, based on safety data provided by EASA Member States through the EUROCONTROL Annual Summary Template (AST) reporting mechanism.

This chapter contains information on accidents and incidents in relation to ATM. The sources of the data, as well as the occurrence category definitions, differ from those of other chapters in this Review. Instead of CICTT categories, as found in similar figures of this report, this chapter uses occurrence categories developed specifically for ATM since 2000. The analysis in the ATM chapter includes accidents which occurred within an EASA MS and involved at least one aircraft with MTOM of 2250kg and above; and incidents that occurred within an EASA MS with no MTOM restrictions.

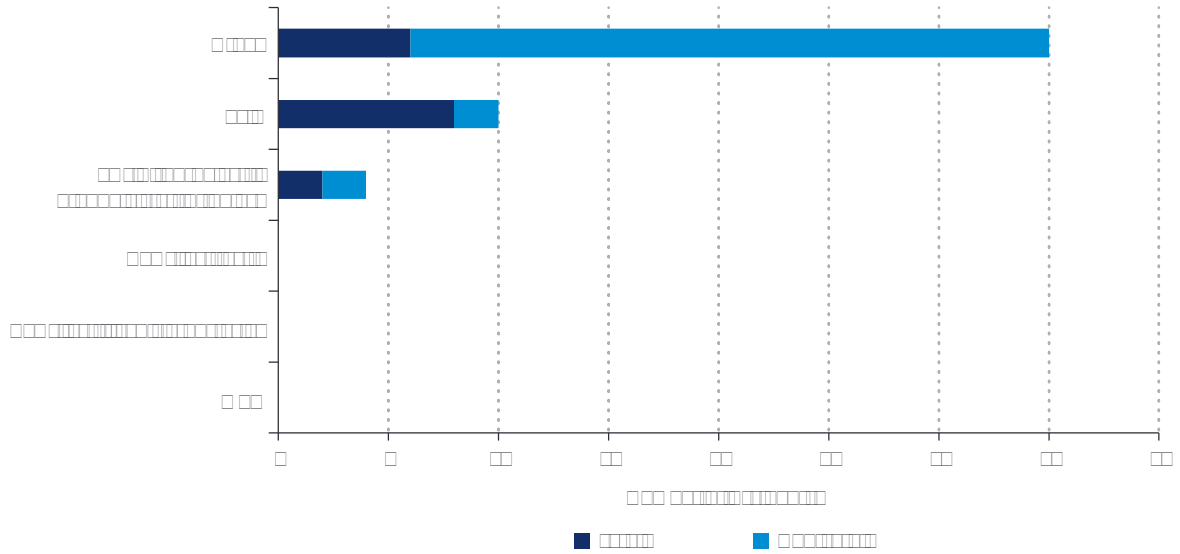
The data used in this chapter are obtained from the mandatory safety data reported to EUROCONTROL by its 40 Member States. For the purpose of this report, the analysis is limited to EASA Member States only.

The Safety Analysis Function EUROCONTROL and associated Repository – **SAFER** - system is EUROCONTROL's principal tool in its safety data analysis work, and consists of a European ATM Safety Data Repository based on mandatory and voluntary safety data reports. SAFER is designed to provide the ATM component of the European Commission's (EC) aviation-wide reporting system, based on ECCAIRS.

Accidents

Figure 47 shows the 2013 distribution of the reported accidents by ATM related accident categories. Of these accidents 16 have been fatal. The most significant accident category in terms of the number of events remains the 'Controlled Flight into Terrain (CFIT)' with 10 events reported, 8 of which were fatal. Another 2 reported accidents involved 'aircraft airborne (near the ground) and aircraft or objects on the ground'. In 2013 there were no 'mid-air collisions' or 'ground collisions between aircraft and vehicles/obstacles'.

Figure 47: ATM Accidents Categories (2013 preliminary data)



In the course of the investigation process two levels of ATM involvement are allocated:

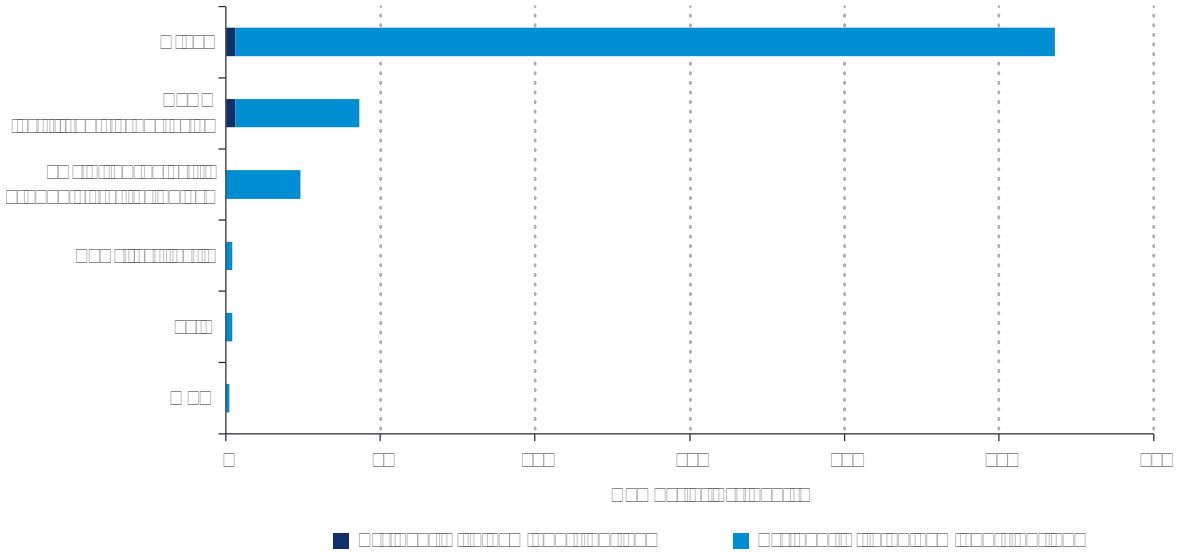
Direct contribution – where the ATM event or item was judged to be directly in the causal chain of events, and;

Indirect contribution– where the ATM event potentially increased the level of severity.

Using 2013 preliminary data, 49 accidents (16 fatal and 33 non-fatal) were reported. None of the reported accidents had either a Direct or Indirect ATM Contribution.

Figure 48 presents the number of accidents and also shows the number of accidents where there was at least one ATM contributory factor in the chain of events). During the last five years (2009-2013) there were only 6 accidents that had a direct ATM contribution. Of these accidents 3 are categorised as 'Ground collision' (GCOL) between an aircraft and a vehicle or obstacle and 3 in the category 'Other'. During the same five year period a total number of 337 accidents were reported to EUROCONTROL, of which 66 were fatal (preliminary data - MTOM 2250 kg and above).

Figure 48: 2009 -2013 ATM Relevant Accidents



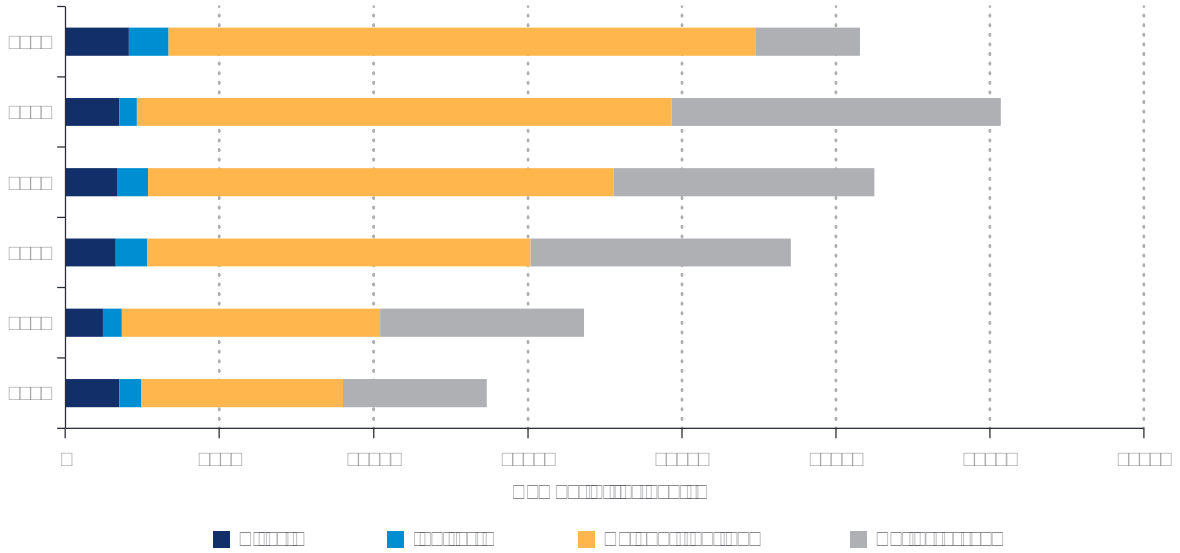
ATM related incidents – Incident categories

An ATM related incident means that it is relevant to ATM, however it does not necessarily need to have an ATM contribution. A short overview of the number of incidents reported in each category since 2008 is presented in Figure 49. An incident can be classified in more than one category (e.g. an incident classified as a Runway Incursion can also be categorised as a deviation from an Air Traffic Control clearance).

Figure 49: ATM Related Incidents by Category

Incident categories that are reported in large numbers are: 'Unauthorised Penetration of Airspace' (UAP), (also known as Airspace Infringements), 'Aircraft deviation from ATC clearance' (CLR), (which includes the incidents categorised as Level Busts), 'Separation Minima Infringement' (SMI) and 'Runway Incursions' (RI). Incidents involving 'Inadequate aircraft Separation' are categorised under 'IS'. Figure 50 shows that only a fraction of the ATM related incidents are having an ATM contribution (either direct or indirect) in the chain of events.

Figure 50: ATM Contribution to the ATM-related Incidents

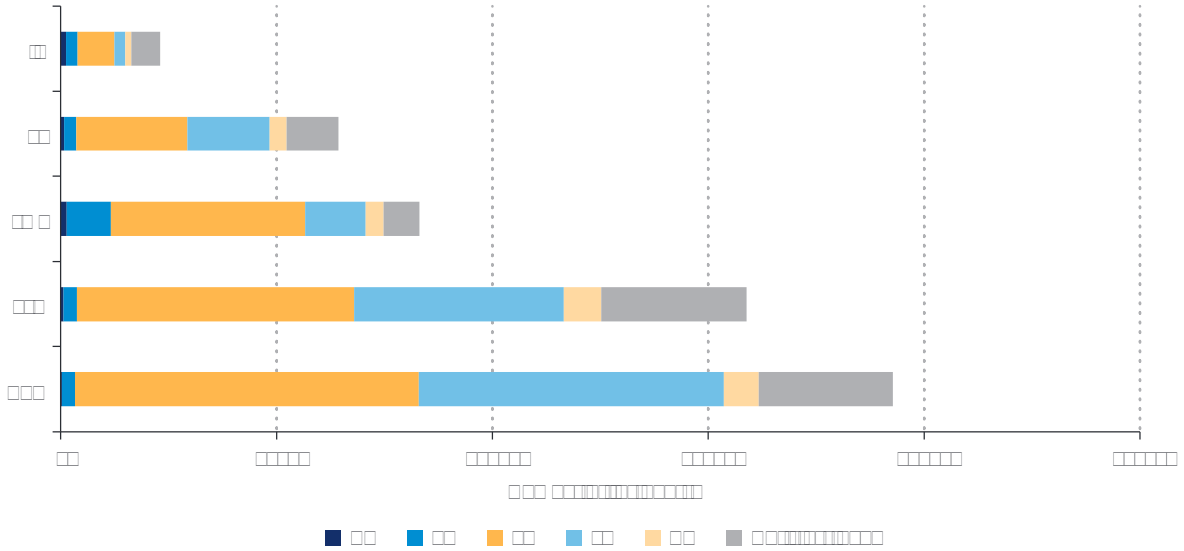


For each ATM related incident it is required that the associated risk be assessed and classified. Risk is defined as the combination between the severity posed by the incident and its likelihood to re-occur.[2]

The risk bearing incidents are considered as those with the highest severity classes: 'Serious incidents' (severity A) and 'Major incidents' (severity B). The other severity classes are: 'Significant' (severity C), 'No safety effect' (E), 'Not determined' (D). Figure 51 shows the number of incidents by severity and incident category.

The category that has the largest proportion of risk bearing incidents (severity A and B) is the 'Separation Minima Infringements' (SMI). This category refers to occurrences in which prescribed separation minima were not maintained between aircraft. It is to be noted that this category is different from the category of 'Inadequate Sep-

Figure 51: ATM Related Incidents by Category and Severity 2009-2013

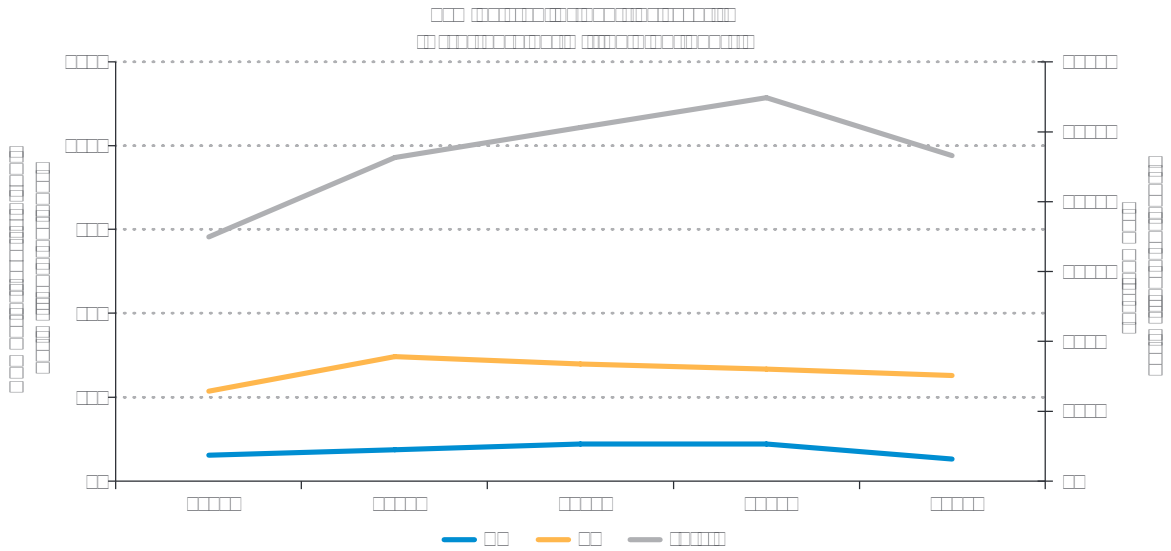


Incident rates and trends

Overall, the reporting of ATM related incidents continues to improve. In addition, the main incident categories have shown a stable trend of similar or decreasing severity in past years. Comparing the number of incidents with the level of traffic can provide meaningful results on the safety trends. The information in this section shows various rates of A and B severity-classified incidents.

Figure 52 shows that there has been a continuous increase in the total number of occurrences per million flight hours reported over the past 5 years (2009-2013). It further shows that while a greater number of occurrences are being reported there has been a slight decrease in the rate of A and B severity-classified incidents. This increase in the rate of all incidents reported is a positive step forward, in the context of a "Just Culture"[3] environment, which includes a good reporting culture, which could enable a better view of the underlying safety issues affecting ATM.

Figure 52: ATM-related Incidents by Severity per million flight hours



During the period 2009-2013 there have been modest annual increases in the rate of serious incidents (severity A). An equally modest decrease was detected in 2012 and preliminary data for 2013 also demonstrates a decrease in the rate of severity A-classified incidents The trend for major incidents (severity B) following a notable increase between 2009 and 2010 is seen to be modestly decreasing for the remainder of the reporting period from 2010-2013. The final data for 2012 show a small percentage decrease compared to the previous year and preliminary data for 2013 now show a considerable decrease. However this needs again to be seen in the context of the described data processing backlog in some Member States.

Figure 53 shows the Rate of ATM related A and B severity-classified incidents relative to the overall number of ATM related occurrences reported. 2013 numbers are based on preliminary data reported.

Figure 53: ATM-related Incidents by Severity A and B (Number of occurrences in absolute numbers)

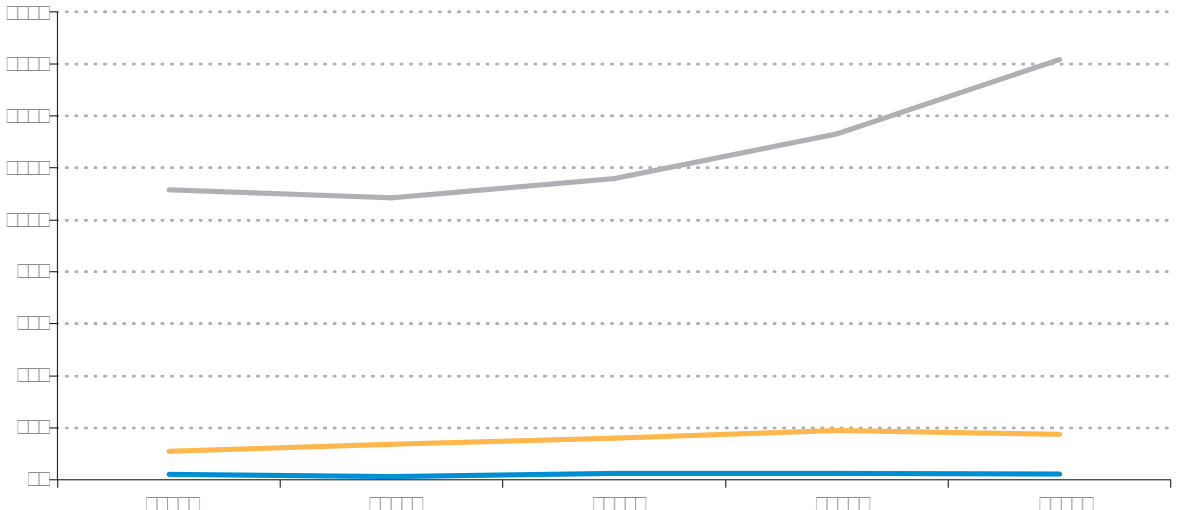
Separation Minima Infringements

Figure 54 shows the rate of 'Separation Minima Infringements' (SMI) 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. SMIs refer to occurrences in which prescribed 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, SMIs typically take the longest time to be investigated, and consequently their number may change in the future.

The SMIs classified as severity A decreased by approximately 42 % between 2009 and 2010. Thereafter this was followed by a considerable increase in 2011. The rate has remained somewhat stable with small annual decreases since. Preliminary 2013 data show a similar trend. The severity B classified SMIs indicated a rising trend in the data reported for the 2009-2012 timeframe. Based on the preliminary 2013 data, a small decrease is observed, the total number reaches a level just in between the totals for 2011 and 2012.

Figure 54: Separation Minima Infringements 2009-2013 (Occurrence per million flight hours)



Runway Incursions

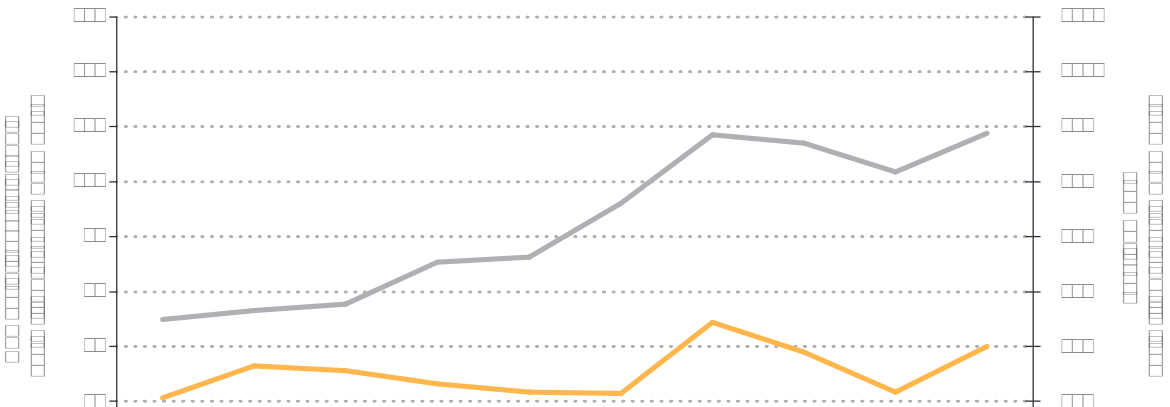
The rate of runway incursion incidents reported over time has shown an overall increasing trend as shown in Figure 55. For runway incursions it is useful to calculate the rate using the number of movements, (arrivals/departures) as this represents the frequency with which a runway is being used.

The total number of runway incursions reported in Europe has increased over the years 2004-2013, with the exception of 2011 and 2012. This can be attributed to improved awareness following the publication of the European Action Plan for the Prevention of Runway Incursions in 2003 coupled with actions taken by States and other involved stakeholders. In addition, the change of the ICAO definition of runway incursion effectively enlarged the scope of occurrences included in this definition.

During the same 10 year period the rate of risk bearing runway incursions has shown quite an amount of movement. The rate of serious incidents (severity A) following a decrease in 2005 steadily increased since then peaking in 2011. Since then, small decreases have been noted and it is hoped the decrease shown in 2013 preliminary data will be continued once final figures are known.

The rate of major incidents (severity B) decreased until 2009 after which 2010 showed a considerable increase and 2011/2012 data indicated a reverse trend, the preliminary 2013 data indicates an increase to almost the same level as for 2010.

Figure 55: Rate of Runway Incursions 2004-2013 (Incidents per million aircraft movements)



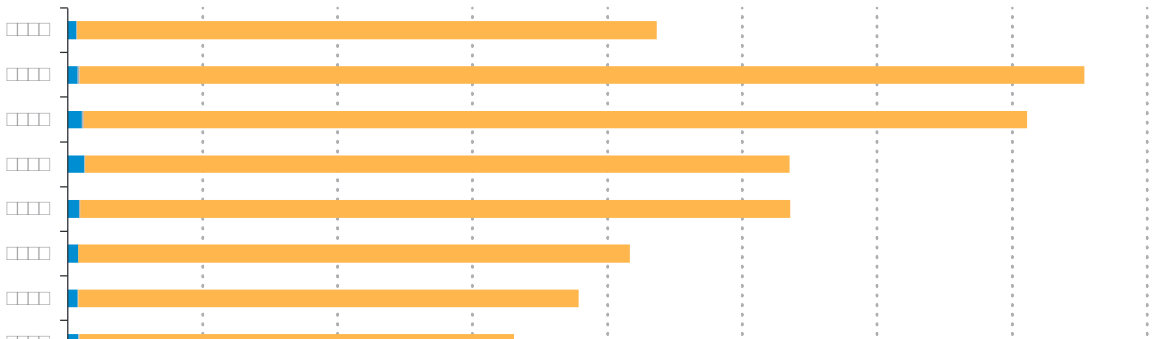
Unauthorised Penetration of Airspace (UAP)/Airspace Infringements

Another incident category that has been closely monitored in ATM for many years is the Unauthorised Penetration of Airspace (UAP) occurrences, otherwise known as Airspace Infringements.

Figure 56 shows the evolution of airspace infringements reported during the period 2004-2013 and indicates that the overall number of this type of incident has risen considerably since 2004 with aggregated increase of over 300% until 2012. In addition, the rate of severity A classified incidents is decreasing and the rate of severity B incidents has also decreased. It must be noted however that the figures for both A and B severity classified incidents when examined both on a annually and over the entire period 2004-2013 have shown modest fluctuations when compared to the growth in the number of total occurrences. That means that the major growth has been in C, D or E severity classified occurrences. Based on the preliminary data reported for 2013, there appears to be a considerable decrease in the total number of UAP incidents reported.

In addition the observed decreasing trend could have been influenced by the start of the implementation period of the European Action Plan for Airspace Infringement Risk Reduction in 2010 and the actions and efforts taken by the Member States together with many involved stakeholders such as Air Navigation Service Providers (ANSPs), Civil Aviation Authorities (CAAs), Military Authorities, Pilot Associations and the General Aviation (GA) community.

Figure 56: Unauthorised Penetration of Airspace 2004-2013 (Occurrences per million flight hours)



Introduction

The European Aviation Community is in a unique position. Over 20 years ago, the European Commission conceptualised a centralised aviation safety data collection supported by a common information technology system. This system is called the European Coordination Centre for Accident and Incident Reporting System (ECCAIRS). In 2012, Version 5 of ECCAIRS was released by the Joint Research Centre of the European Commission. The ECCAIRS system provides a standard format for the sharing and storage of safety occurrences sourced from the entire European Aviation Community. Not only is ECCAIRS used by Regulatory organisations and accident investigation authorities across Europe, but owing to the support of ICAO, it is also used by many organisations around the world. The existence of ECCAIRS and its use at a global level enables occurrence reports from the diverse aviation community to be shared more easily.

Most importantly, ECCAIRS enables aviation safety occurrences originating from EASA Member States to be 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 Member States to make "all relevant safety-related information" stored in their databases available to the competent authorities of other Member States and the European Commission. The Member States were also required to ensure that their databases were compatible with the ECCAIRS software. Furthermore, according to Commission Regulation (EC) No 1321/2007, Member States were obliged to integrated their occurrence data into the ECR. By the end of 2011, all of the Member States were integrating their data into the ECR.

One of the current difficulties of the ECR is that the narratives from occurrences are only available to the country who submitted the data in the first instance. However, the adoption of Regulation (EU) 376/2014 on the Reporting, Analysis and Follow-up of Occurrences in Civil Aviation will enable both EASA and the competent authorities of the Member States to have full access to the ECR. This will be a significant step forward and will have a positive effect on the use of the ECR for safety analysis purposes.

Using the ECR to Improve Safety

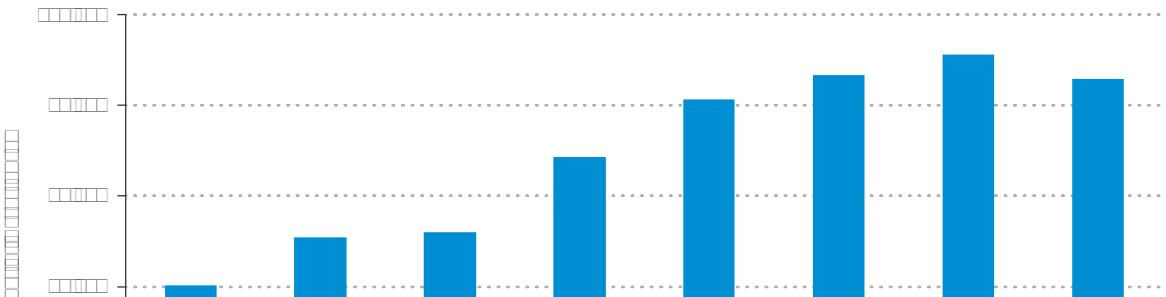
The data in the ECR is vital to the aviation safety management activity that is carried out as part of both the European Aviation Safety Plan (EASp) and the State Safety Plans (SSp) of the EASA Member States. Due to the high level of aviation safety in Europe, accidents and serious incidents are rare events and the data in the ECR provides the widest possible source of Pan-European safety data. The data in the ECR is used by EASA and the Member

is increasing every year and the data quality has improved significantly over the past few years. This means that the vision of the ECR being a vital resource for safety analysis at the 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.

The ECR at a Glance

At the end of 2013 there was a total of 800,614 occurrences in the ECR. Figure 57 provides details of the occurrences in the ECR by the date of occurrence. In the early years of the ECR, between 2006 and 2009, there was a steady increase in the number of occurrences that were made available by the Member States. Since 2009 the number of occurrences has begun to stablise in the range of 80,000 to 95,000 occurrences per year. 2013 has seen a small reduction in the number of safety occurrences provided to the ECR. The pooling of such a large number of occurrences in a single database highlights the importance of the ECR as a usable resource that is available to EASA and the Member States in their analysis. The ECR provides a far greater amount of information than would available to any single Member State alone. The challenge is to continually improve the quality of the data provided by the Member States so that the ECR 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 the work of the European Commission through Directorate General for Mobility and Transport and the Joint Research Centre (JRC), EASA, Eurocontrol and the responsible entities of the Member States via the Network of European Aviation Safety Analysts (NoA).

Figure 57: Occurrences in the ECR by Date



insufficiently coded are likely to involve Commercial Air Transport, which already account for 46% of the occurrences reported to the ECR. General Aviation accounted for 5% of the occurrences and State Flights were 1% of the occurrences, both of which are unchanged from the previous year. A smaller number of occurrences, less than 1%, involved Aerial Work.

Figure 58: Distribution of occurrences in the ECR by Type of operation

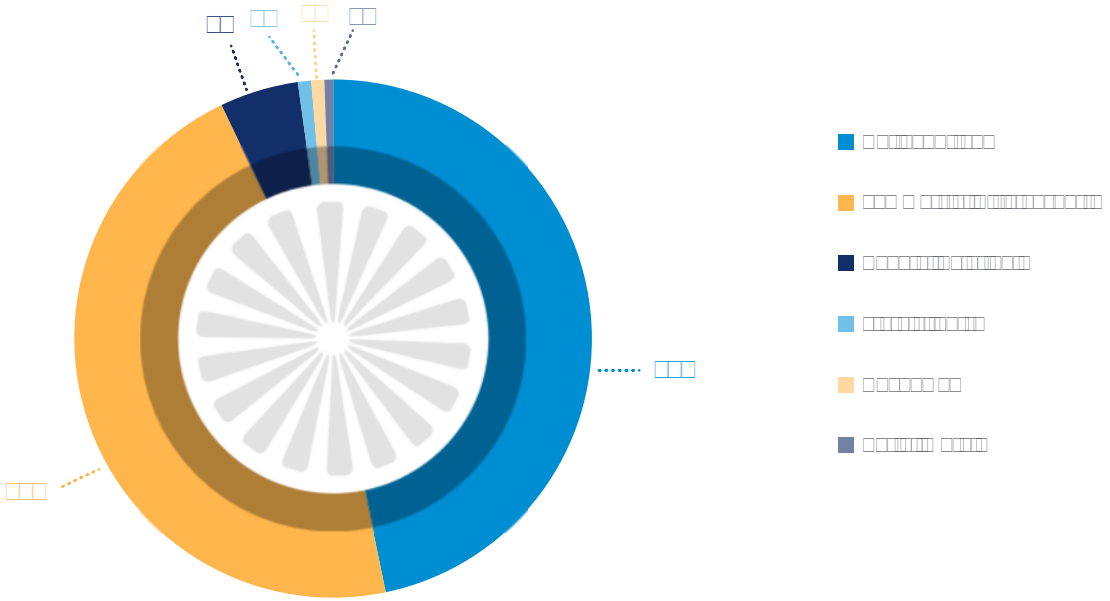


Figure 59 provides a breakdown of occurrences held in the ECR by occurrence class. The overwhelmingly largest class is Incident, which comprises 79% of the total occurrences followed by Occurrences Without Safety Effect (11%). It must be noted that Accident class occurrences comprise only 2% of the repository.

Figure 59: Distribution of occurrences in the ECR by Occurrence Class

European Network of Analysts

Analysis of the ECR at a European Level is carried out by the European Network of Safety Analysts (NoA), which brings together the safety analysis departments of the competent authorities with EASA, Eurocontrol and the European Commission, in order to support safety planning activities. The NoA uses the information in the ECR with a range of other data sources to help identify the safety risks. These risks are then reported via 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 events that are reported by the EASA MS.

Figure 60 provides details of the Top 10 Occurrence Categories within the ECR. The largest number of occurrences was classified as “Other”, which is the same situation as last year. Work has recently been carried out to analyse occurrences classified as “Other”. This work has identified that a large number of these pertain to Medical situations involving either crew members or passengers. As a consequence, a new Occurrence Category covering this type of occurrence will be introduced during 2014. The subsequent most numerous Occurrence Categories in decreasing ranked order were ATM/ CNS, System/ Component Failure Non-Powerplant (SCF-NP), Ramp and Birdstrikes. It is interesting to note that Runway Incursion has dropped from the Top 10 and has been replaced by Cabin Safety Events.

Figure 60: Top 10 Occurrence Categories in the ECR.

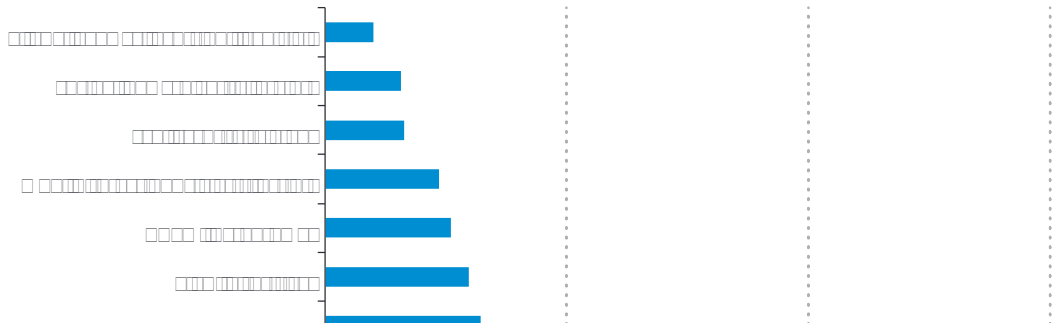
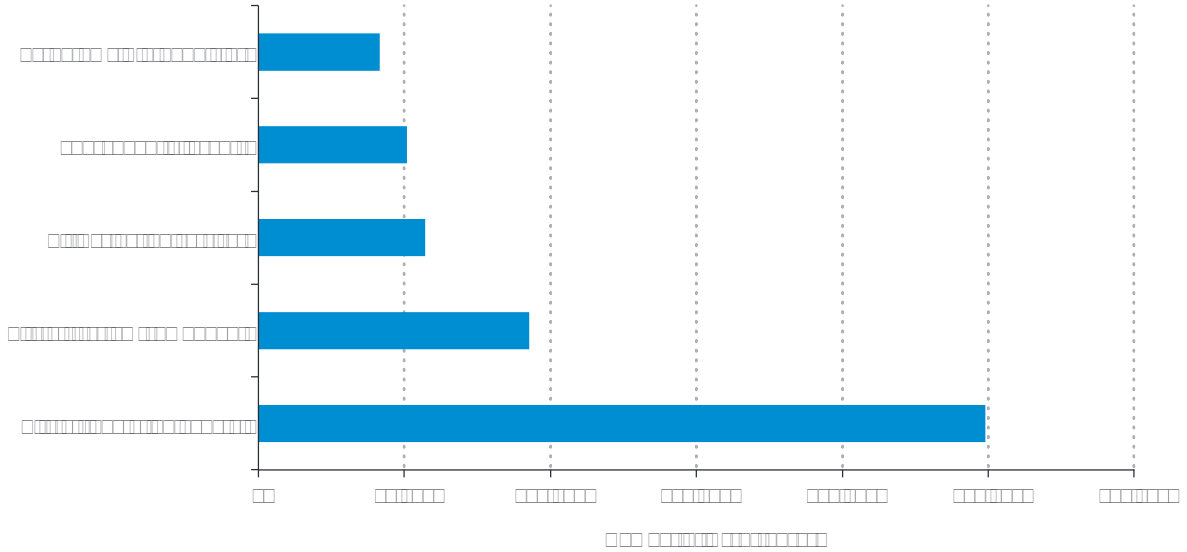


Figure 61: Top 5 Level 1 Event Types in the ECR

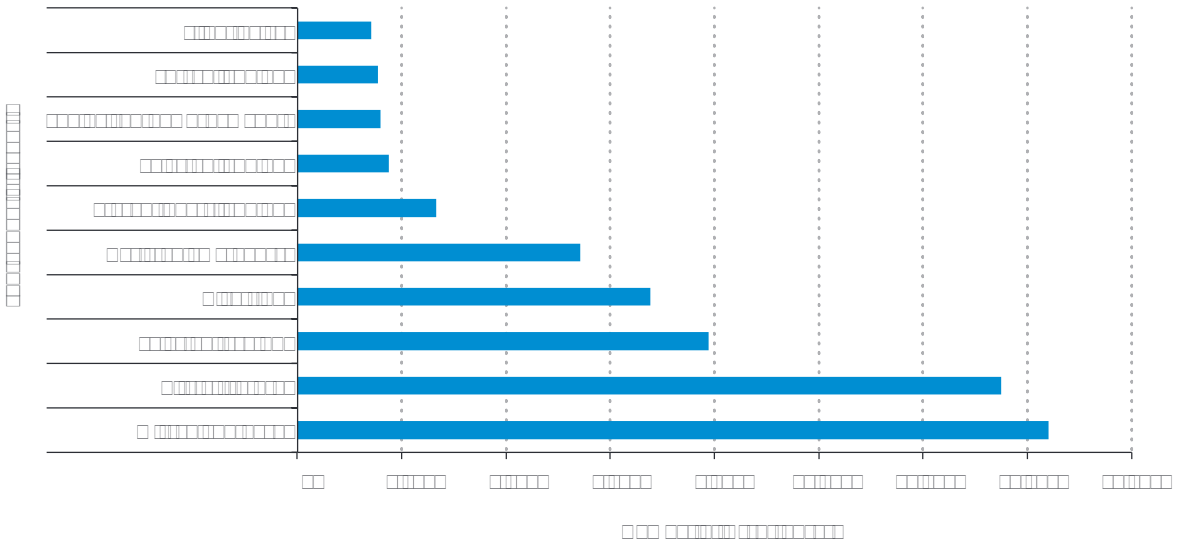


A more detailed analysis of the Event Types is shown in Figure 62, which has information on the Top 10 Level 2 Event Types. The most numerous Level 2 Event Type is Flight Crew/ ANS, which involves interaction between the Flight Crew of an aircraft and the Air Navigation Services. This is followed by Aircraft – Collision with Obstacle/ Terrain/ Aircraft, which is often used to classify occurrences where there has been a near collision event. Therefore the recorded incidence of this occurrence type is not necessarily indicative of the number of actual collisions. Compared to last year's analysis, it is interesting to note that Landing Gear and Flight Crew related events have dropped out of the Top 10 and have been replaced with Incursions and the Triggering of Warning Systems. The latter is considered to be due to the increasing amount of warning systems on more modern aircraft.

Figure 62: Top 10 Level 2 Event Types in the ECR

Information on the Consequential Events of occurrences in the ECR is shown in Figure 63. Consequential Events are used to describe the effects of the occurrence on the operation of the aircraft. The most frequent consequence of occurrences in the ECR was a Missed Approach, which has displaced Aircraft Return as the Number 1 consequential event, and involves the aircraft returning to its original departure point following the occurrence. There were also occurrences involving Rejected Take-Offs and Diversions where the aircraft was forced to divert from its planned destination to another airport. In addition, just over 5,400 occurrences involved a flight crew having declared an emergency.

Figure 63: Top 10 Consequential Events in the ECR



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 in providing the best possible knowledge of the key risks to aviation in Europe.

Apendices

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.
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.

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.
FIR	Flight Information Region
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
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 occurrences at a high-level to permit analysis of the data. The

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

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

CLR	Deviation of ATC Clearance

Appendix 2 List of Figures and Tables

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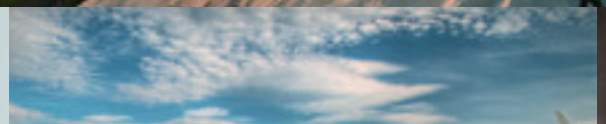
Appendix 3 List of Fatal Accidents in 2013

This list only includes 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
04/01/2013	Venezuela	BRITTEN NORMAN BN2A-26	Passenger	6	0	UNK: Unknown or undetermined
15/01/2013	United States	CESSNA 208	Cargo	1	0	UNK: Unknown or undetermined
23/01/2013	Antarctica	DE HAVILLAND DHC6	Ferry/ positioning	3	0	CFIT: Controlled flight into or toward terrain
29/01/2013	Kazakhstan	CANADAIR CL600	Passenger	21	0	CFIT: Controlled flight into or toward terrain
13/02/2013	Ukraine	ANTONOV AN24	Passenger	5	0	ARC: Abnormal runway contact F-POST: Fire/smoke (post-impact)
04/03/2013	Congo, the Democratic Republic of	FOKKER F27	Cargo	7	0	UNK: Unknown or undetermined
06/03/2013	Peru	BEECH 200	Passenger	9	0	UNK: Unknown or undetermined
08/03/2013	United States	BEECH 1900	Cargo	2	0	CFIT: Controlled flight into or toward terrain
12/03/2013	Brazil	PIPER PA31	Passenger	10	0	UNK: Unknown or undetermined
29/04/2013	Afghanistan	BOEING 747-400	Cargo	7	0	LOC-I: Loss of control - inflight SCF-NP: System/ component failure or malfunction non-powerplant
29/06/2013	Botswana	EMBRAER EMB110	Cargo	2	0	CFIT: Controlled flight into or toward terrain
						USOS: Undershoot/overshoot

Local Date	State of Occurrence	Aircraft Type	Operation Type	Fatalities on Board	Ground Fatalities	Occurrence Categories
06/10/2013	Puerto Rico	BRITTEN NORMAN BN2A	Cargo	1	0	UNK: Unknown or undetermined
10/10/2013	Malaysia	DE HAVILLAND DHC6	Passenger	2	0	USOS: Undershoot/overshoot
14/10/2013	Mexico	CESSNA 208	Passenger	14	0	UNK: Unknown or undetermined
16/10/2013	Lao Peoples Democratic Republic	ATR72	Passenger	49	0	LOC-I: Loss of control - inflight
03/11/2013	Bolivia	SWEARINGEN SA-227	Passenger	8	0	RE: Runway excursion F-POST: Fire/smoke (post-impact)
10/11/2013	Ontario	SWEARINGEN SA-227	Passenger	5	0	CTOL: Collision with obstacle(s) during take-off and landing F-POST: Fire/smoke (post-impact)
17/11/2013	Russian Federation	BOEING 737-500	Passenger	50	0	AMAN: Abrupt maneuvre LOC-I: Loss of control - inflight F-POST: Fire/smoke (post-impact)
19/11/2013	United States	LEARJET 35	Ferry/ positioning	4	0	SCF-PP: powerplant failure or malfunction
25/11/2013	Papua New Guinea	CESSNA 208	Passenger	3	0	SCF-PP: powerplant failure or malfunction
29/11/2013	Namibia	EMBRAER ERJ190	Passenger	33	0	UNK: Unknown or undetermined F-POST: Fire/smoke (post-impact)
29/11/2013	United States	CESSNA 208	Passenger	4	0	LOC-I: Loss of control - inflight
02/12/2013	Puerto Rico	SWEARINGEN SA-226	Cargo	2	0	SCF-NP: System/component failure or malfunction
26/12/2013	Russian Federation	ANTONOV AN12	Cargo	9	0	UNK: Unknown or undetermined



EASA

European Aviation Safety Agency