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

ANNUAL SAFETY REVIEW 2009

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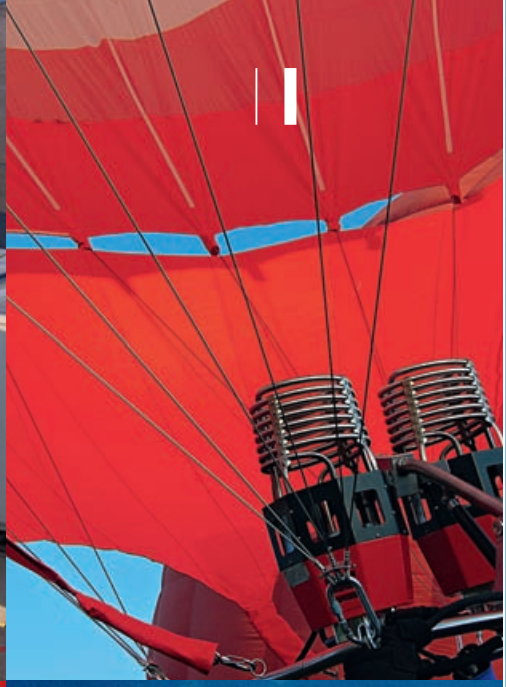


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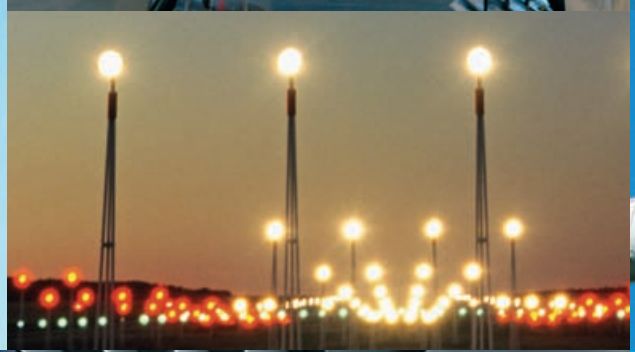
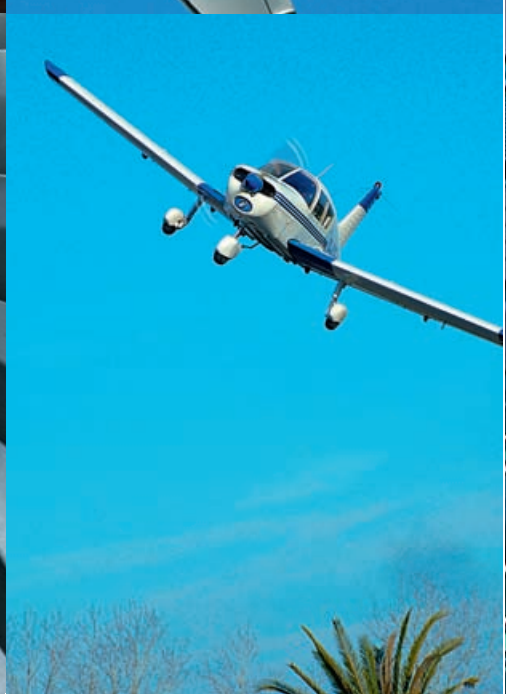




Overview and key facts 2009

Total number of accidents and fatal accidents for EASA MS operators – commercial air transports

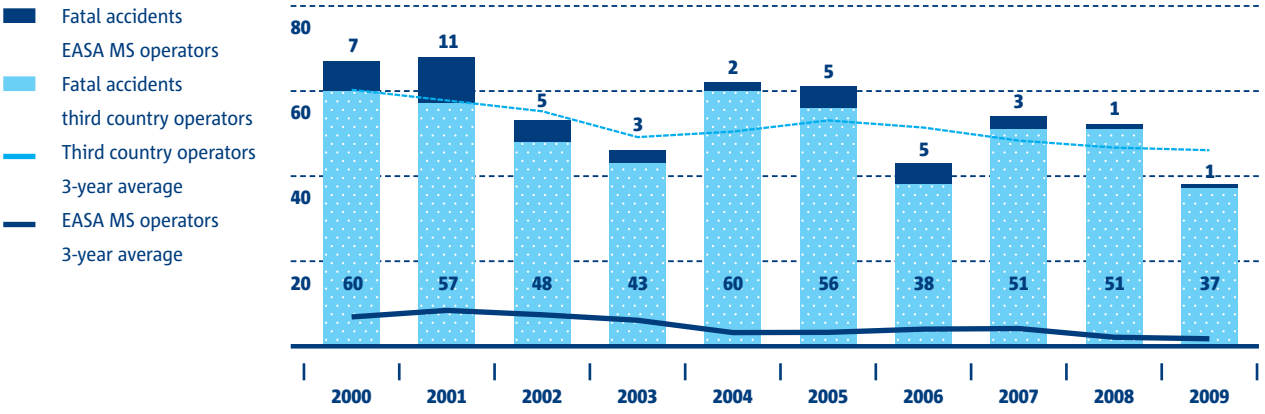
Aeroplanes

Period	Number of accidents	Fatal accidents	Fatalities on board	Ground fatalities
1998–2007 (average)	26	4	93	1
2008 (total)	31	1	154	0
2009 (total)	17	1	228	0

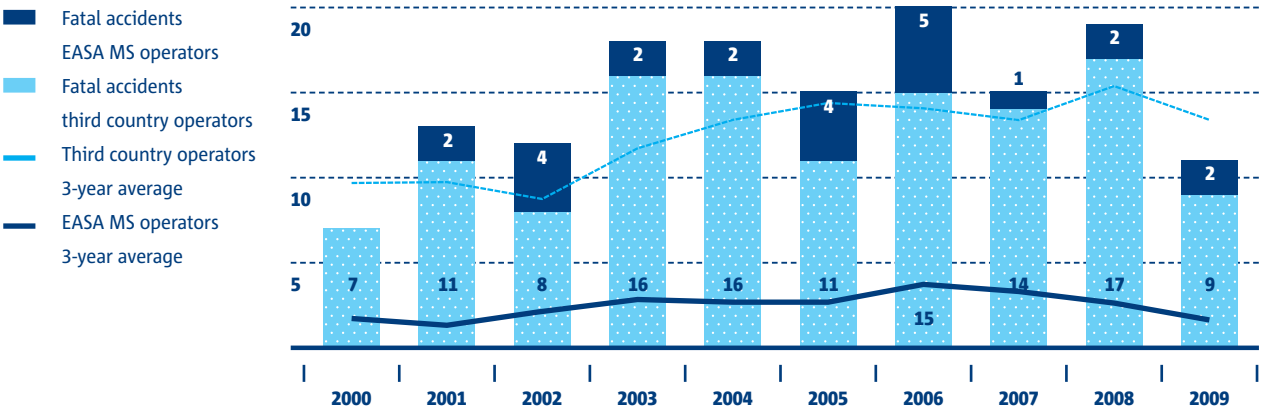
Helicopters

Period	Number of accidents	Fatal accidents	Fatalities on board	Ground fatalities
1998–2007 (average)	8	3	11	0
2008 (total)	10	2	4	0
2009 (total)	5	2	18	0

Fatal accidents in commercial air transport – EASA MS and third country operated aeroplanes



Fatal accidents in commercial air transport – EASA MS and third country operated helicopters



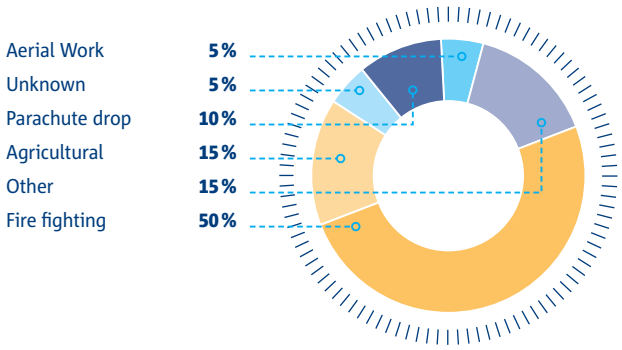
Accidents, Fatal accidents and related fatalities – Aircraft with a mass below 2 250 kg, by year and aircraft category, EASA MS

Aircraft category	Period	Number of accidents	Fatal accidents	Fatalities on board	Ground fatalities
Balloon	2006–2008	23	0	0	0
	2009	20	0	0	0
Aeroplane	2006–2008	536	63	118	1
	2009	528	62	118	2
Glider	2006–2008	186	18	19	0
	2009	213	20	25	0
Gyroplane	2006–2008	10	3	3	0
	2009	12	1	2	0
Helicopter	2006–2008	79	8	18	1
	2009	95	15	28	2
Microlight	2006–2008	211	33	48	0
	2009	225	45	60	0
Other	2006–2008	64	9	11	1
	2009	67	12	12	0
Motorgliders	2006–2008	51	10	15	0
	2009	74	8	8	0
(Average)	**2006–2008**	**1,160**	**145**	**234**	**3**
(Total)	**2009**	**1,234**	**163**	**253**	**4**
Increase (%)		**6.3%**	**12.4%**	**8.3%**	**20.0%**

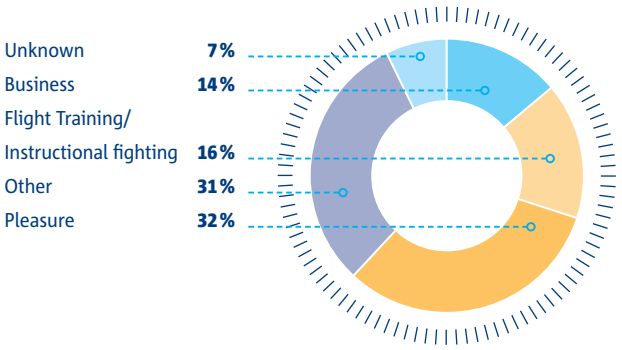
Note: Numbers for period 2006–2009 are average of three years. Data as reported to EASA.

Fatal accidents – aeroplanes over 2 250 kg – EASA MS registered

Distribution by type of Aerial Work



Distribution by type of General Aviation



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Information on the European Aviation Safety Agency is available on the Internet (**www.easa.europa.eu**).

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Executive Summary

Aviation Safety in Europe in the year 2009 was marked by an accident of an Airbus 330 over the Atlantic which involved 228 fatalities. This accident involved the largest number of fatalities in the year worldwide. Another important accident for Europe was that of a Super Puma during a helicopter offshore operation involving 16 fatalities.

The safety record showed also that the number of fatal accidents in commercial air transport dropped to 1 in 2009 and is one of the lowest in the decade. In 2009, only 2.6 percent of all fatal accidents in commercial air transport worldwide occurred with aeroplanes operated by a company from a Member State of the European Aviation Safety Agency (EASA MS). The fatal accident rate of scheduled passenger operations is significantly lower in Europe than in the rest of the world. The number of fatal accidents in helicopter commercial air transport operations in Europe was two, the same as in 2008, and equal to the ten year average of two.

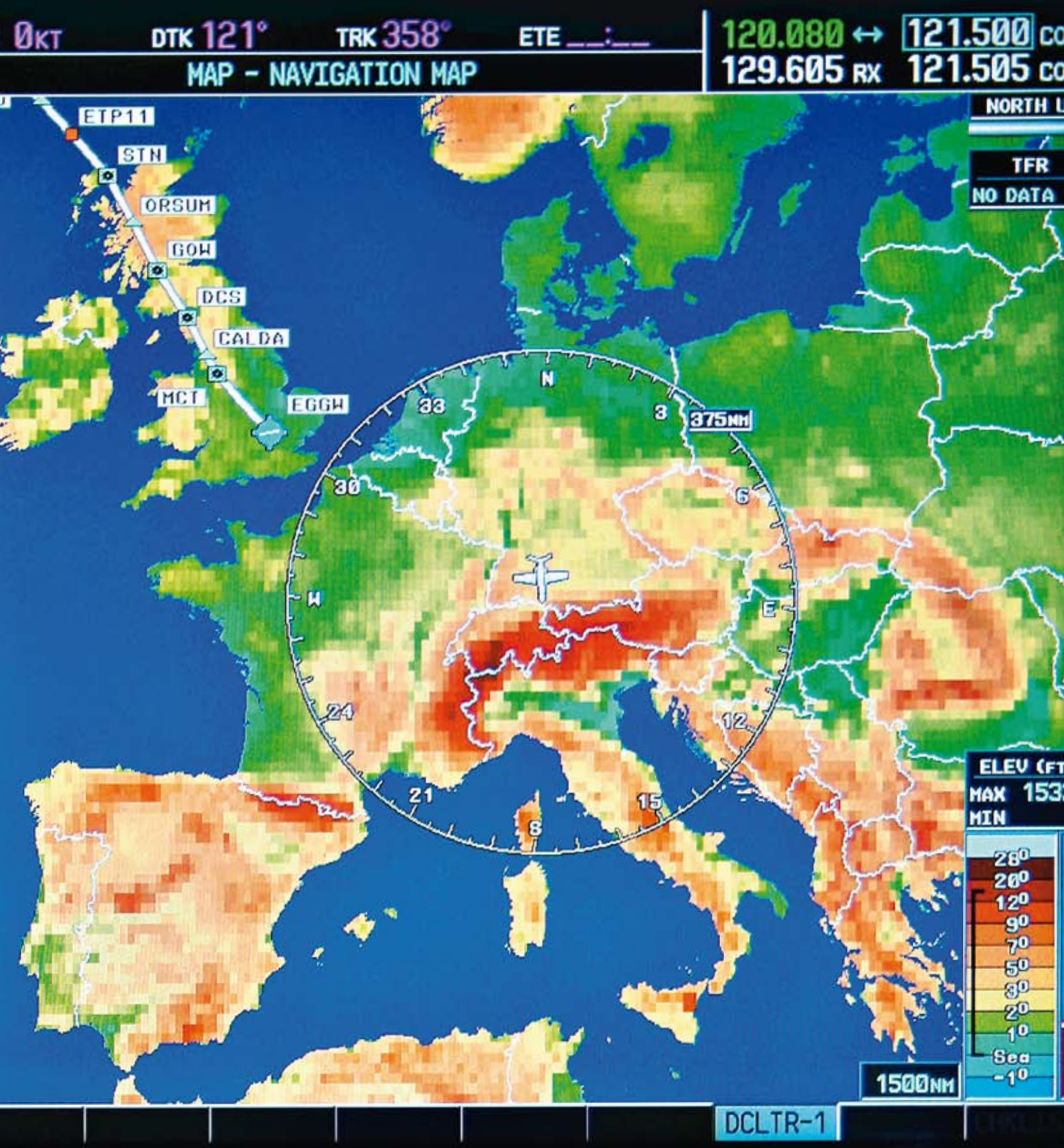
The number of fatal accidents for general aviation and aerial work operations with aeroplanes and helicopters remained relatively stable. 'Loss of control in-flight' (LOC-I) is the most frequent accident category for this type of operations. Technical issues appear to play a much smaller role.

For the fourth time, the Agency collected accident data for light aircraft (Maximum certificated Take-Off Mass (MTOM) below 2 250 kg) from EASA MS. Overall, the number of accidents in 2009 was 1,234 in this category of aircraft was above the 2006 (1,121) and 2007 (1,157) figures. The data received were not complete. Several States did not report. The Agency continues to cooperate with EASA MS to further improve harmonisation of data collection and to facilitate data sharing.

This is the first year that the Annual Safety Review provides information regarding the European Central Repository for occurrences (ECR). The number of reports and States reporting is encouraging. Challenges remain to the quality and accessibility of the data.

The ANNUAL SAFETY REVIEW also offers an overview of aviation safety measures taken in the different EASA Directorates. The Certification Directorate is responsible for the initial and continuing airworthiness of aeronautical products, parts and appliances. The Rulemaking Directorate is drafting new or amendments to existing regulations to ensure high common aviation safety standards in Europe. In the Standardisation Directorate compliance with these rules is monitored.

In 2009 the European Strategic Safety Initiative continued its activities and progress. The European Commercial Aviation Safety Team published best practice material on Safety Management Systems (SMS). The European Helicopter Safety Team published in April 2009 a preliminary analysis report of 2000–2005 European accidents. The European General Aviation Safety Team (EGAST) published safety promotion material on Loss of Control and Collision Avoidance.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15
8
NORTH
TFR
NO DATA
ELEV (FT
MAX 153
MIN
28⁰
20⁰
12⁰
9⁰
7⁰
5⁰
3⁰
2⁰
1⁰
Sea
-1⁰
1500NM
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1.0 Introduction

1.1 Background

Air transport is one of the safest forms of travel. It is essential to improve that level of safety for the benefit of the European citizens. The European Aviation Safety Agency (EASA) is the centrepiece of the European Union's strategy for aviation safety. The Agency develops common safety and environmental rules at European level. Also, it monitors the implementation of standards through inspections in the Member States and provides the necessary technical expertise, training and research. The Agency works hand in hand with the national authorities which continue to carry out many operational tasks, such as certification of individual aircraft or pilot licensing.

This document 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. Analysis of information received from oversight and enforcement activities may be published separately.

1.2 Scope

This ANNUAL SAFETY REVIEW presents statistics on European and worldwide civil aviation safety. The statistics are grouped according to type of operation, for instance commercial air transport, and aircraft category, such as aeroplanes, helicopters and gliders. The Agency had access to accident and statistical information collected by the International Civil Aviation Organisation (ICAO). States are required, according to ICAO Annex 13 'Aircraft accident and incident investigation', to report to ICAO information on accidents and serious incidents to aircraft with a maximum certificated take-off mass (MTOM) over 2 250 kg. Therefore, most statistics in this review concern aircraft above this mass. In addition to the ICAO data, a request was made to the EASA Member States (EASA MS) to obtain light aircraft accident data for the years 2006–2009. Furthermore, data on the operation of aircraft for commercial air transport was obtained from both ICAO and the NLR Air Transport Safety Institute (The Netherlands).

The ANNUAL SAFETY REVIEW (ASR) is based on the data that were available to the Agency on 23 March 2010. Any changes after that date are not included. ***Note:*** Much of the information is based on initial data. That data is updated as results of investigations become available. As investigations may take several years, data from previous years may need to be modified. This leads to differences between data reported in this ASR when compared to that of previous years.

In this review the terms 'Europe' and 'EASA Member States' are considered as the 27 EU Member States plus Iceland, Liechtenstein, Norway and Switzerland. The region is assigned based on the State of the Operator of the accident aircraft for commercial air transport operations. For all other operations, the region is assigned based on the State of Registry.

Within the statistics, special attention is given to fatal accidents. In general these accidents are internationally well documented. Figures including non-fatal accident numbers are also presented.

1.3 Content of the report

Based on feedback received, some changes have been introduced in this Annual Safety review: In **Chapter 3**, the statistics on commercial aviation are based on the State of the Operator contrary to previous years, where they were based on the State of Registry. A new chapter was added providing an initial view of data contained in the European Central Repository of occurrences (ECR). The tabulation of accidents in the Appendix now also shows the related accident categories.

Chapter 2 presents an overview of the historical development of aviation safety. Statistics on commercial air transport operations are provided in **Chapter 3. Chapter 4** provides data on general aviation and aerial work. **Chapter 5** covers light aircraft accidents in EASA MS. **Chapter 6** gives an initial review of the data in the European Central Repository of occurrences. Finally, **Chapter 7** provides an overview of aviation safety measures taken in the different EASA Directorates.

An overview of used definitions and acronyms as well as extra information on the accident categories can be found in **Appendix 2: Definitions and acronyms.**

2.0 Historical development of aviation safety

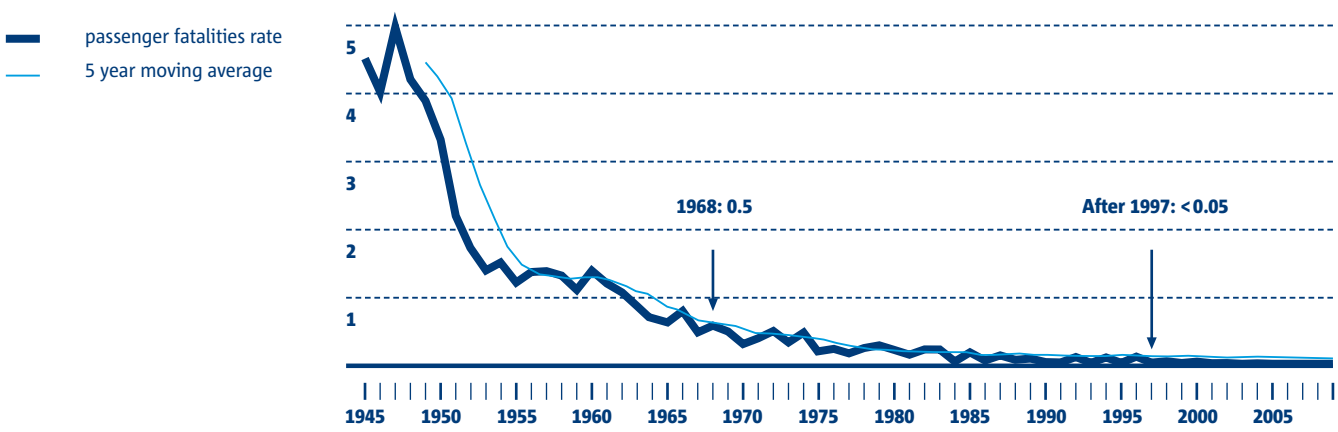
Since 1945, ICAO has been publishing accident rates for accidents involving passenger fatalities (excluding acts of unlawful interference with civil aviation) for scheduled commercial transport operations. The figures below are based on accident rates published in the ANNUAL REPORT OF THE COUNCIL of ICAO. The rates for the year 2009 are based on preliminary estimates.

The data in **FIGURE 2-1** show that the safety of aviation has improved from 1945 onwards. Based on the measure of passenger fatalities per 100 million miles flown, it took some 20 years (1948 to 1968) to achieve the first 10-fold improvement from 5 to 0.5. Another 10-fold improvement was reached in 1997, almost 30 years later, when the rate had dropped below 0.05. For the year 2009 this rate is estimated[1] to have stayed at 0.01 fatalities per 100 million miles flown.

The accident rate in this figure appears to be flat for recent years. This is the result of the scale used to reflect the high rates in the late 1940s.

FIGURE 2-1

GLOBAL PASSENGER FATALITIES PER 100 MILLION PASSENGER MILES, SCHEDULED COMMERCIAL TRANSPORT OPERATIONS, EXCLUDING ACTS OF UNLAWFUL INTERFERENCE



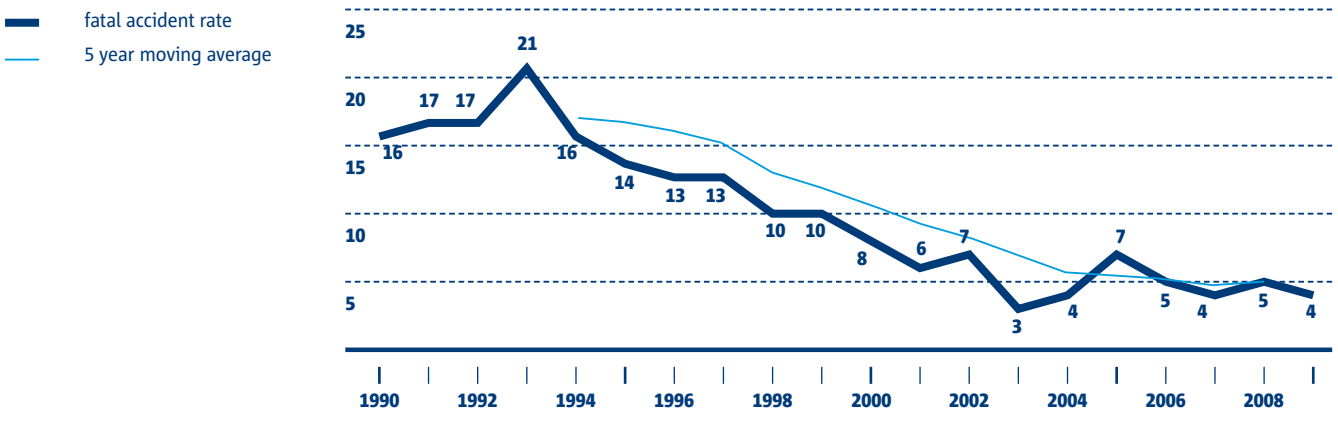
Note: [1]The number may change once details on the traffic in 2009 become available.

In the ANNUAL REPORT OF THE COUNCIL, ICAO also produces accident rates for accidents involving passenger fatalities. The progress of this rate over the past 20 years is shown in **FIGURE 2-2**.

The rate of accidents involving passenger fatalities in scheduled operations (excluding acts of unlawful interference) per 10 million flights ranged from 16 (1990) to 21 (1993) and showed no improvement from 1990 to 1993. From that year, the rate dropped continuously until 2003, where it reached its lowest value, three. After increases in 2004 and 2005, in line with the decreasing number of fatal accidents the rate dropped in 2007 to four, increased to 5 in 2008[2] to drop back to 4 (estimate) in 2009. The 5 year moving average rate has remained almost constant since 2004. It should be noted that the accident rate for scheduled operations differs significantly per world region **(FIGURE 2-3)**.

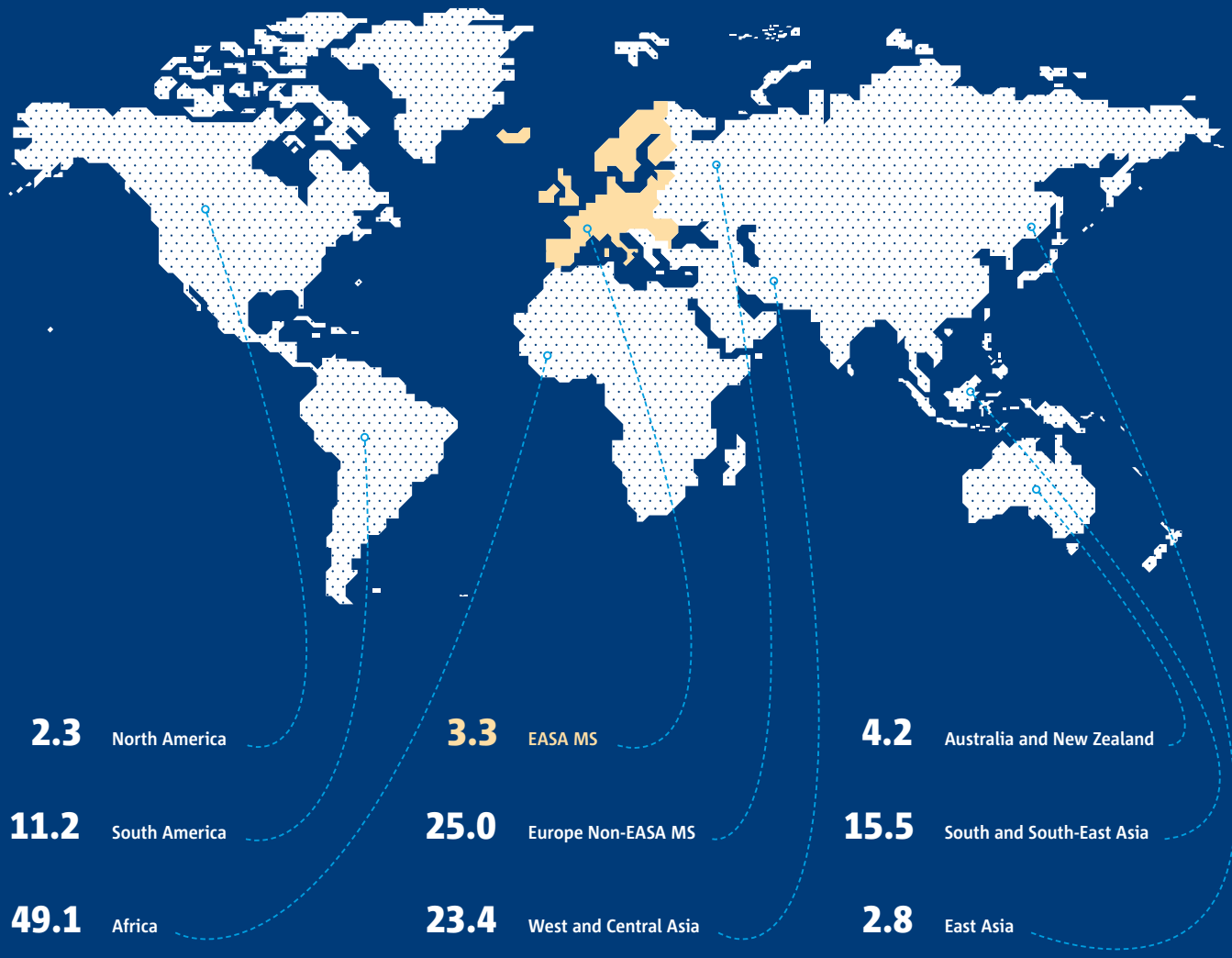
FIGURE 2-2

GLOBAL RATE OF ACCIDENTS INVOLVING PASSENGER FATALITIES PER 10 MILLION FLIGHTS, SCHEDULED COMMERCIAL AIR TRANSPORT OPERATIONS, EXCLUDING ACTS OF UNLAWFUL INTERFERENCE



Note: [2] This number was revised from the initial estimate of 4 to 5 based on the drop in traffic in 2008.

FIGURE 2-3 **RATE OF FATAL ACCIDENTS PER 10 MILLION FLIGHTS PER WORLD REGION (2000 – 2009, SCHEDULED PASSENGER AND CARGO OPERATIONS)**



The region of South America includes Central America and the Caribbean. The regions of North America, East Asia and EASA MS have the lowest rates of fatal accidents in the world.

3.0 Commercial air transport

This Chapter reviews the aviation accident data for commercial air transport operations. These operations involve the transportation of passengers, cargo and mail for remuneration or hire. The accidents concerned involved at least one aircraft with a certificated maximum take-off mass (MTOM) over 2 250 kg. Aircraft accidents were aggregated by the State in which the aircraft operator was registered in. Accidents and fatal accidents were identified as such using the definition of ICAO Annex 13 'Aircraft accident and incident investigation'.

This chapter is divided into two main sections:
One for aeroplanes and another one for helicopters.

3.1 Aeroplanes

Aircraft accidents involving a fatality are random events and one year may exhibit a very different number of fatal accidents from the previous year. The number of fatalities on board for 2009 (228 fatalities) was above the average of the decade 1998–2007 (93). A total of 228 persons were fatally injured when an Airbus A330 crashed into the Atlantic Ocean on 1st June **(Table 3-1)**.

Table 3-1 **Overview of total number of accidents and fatal accidents for EASA MS operators (aeroplanes)**

Period	Number of accidents	Fatal accidents	Fatalities on board	Ground fatalities
1998–2007 (average)	26	4	93	1
2008 (total)	31	1	154	0
2009 (total)	17	1	228	0

FIGURE 3-1

FATAL ACCIDENTS IN COMMERCIAL AIR TRANSPORT – EASA MS AND THIRD COUNTRY OPERATED AEROPLANES

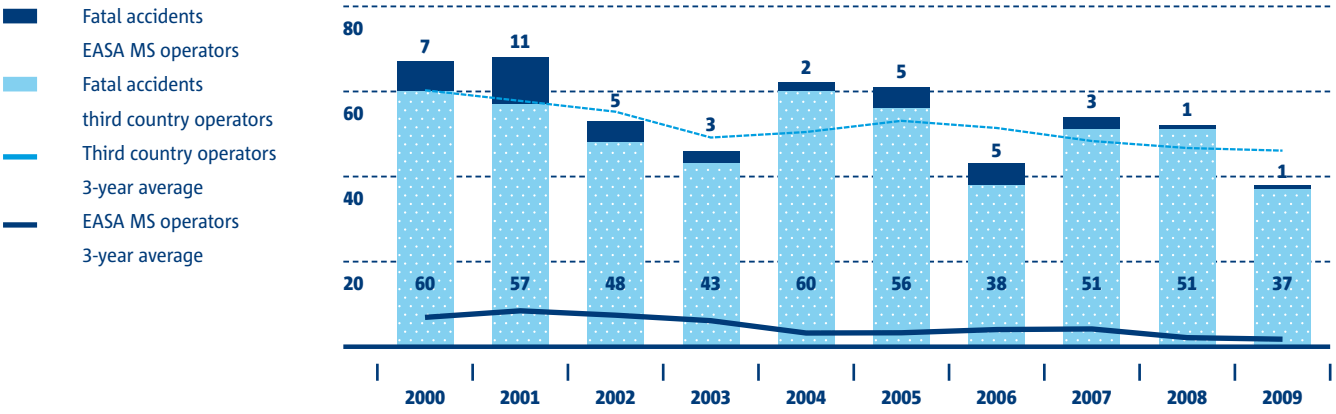


FIGURE 3-2

RATE OF FATAL ACCIDENTS IN SCHEDULED PASSENGER OPERATIONS – EASA MS AND THIRD COUNTRY OPERATED AEROPLANES (FATAL ACCIDENTS PER 10 MILLION FLIGHTS)

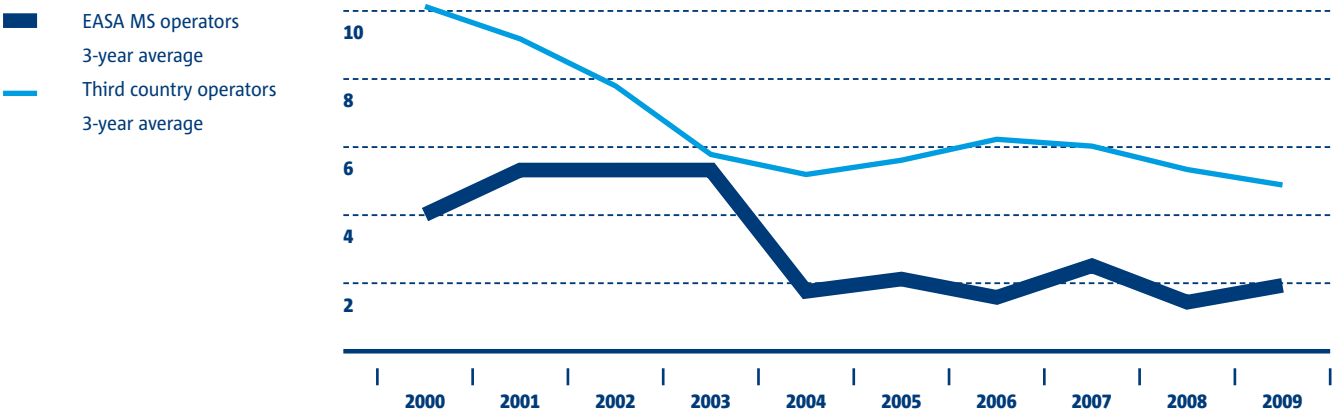


FIGURE 3-1 presents the number of accidents for aeroplanes operated by EASA MS and third country (non-EASA MS) operators within the decade 2000 to 2009. The number of fatal accidents for third country operated aeroplanes has decreased from 51 in 2008 to 37 in 2009. The trend for the decade indicates that the number of fatal accidents worldwide is declining.

In 2009, the number of accidents involving aircraft operated by EASA MS airlines continued to be one of the lowest on record. The declining trend of recent years in the number of fatal accidents has continued.

3.1.1 FATAL ACCIDENT RATES

The number of accidents alone describes only part of the safety level for a given period. In order to derive more meaningful conclusions, the absolute number of accidents is combined with the number of flights. The resulting rates allow the development of safety trends, by taking into account changes in the level of traffic. **FIGURE 3-2** provides the fatal accident rate per 10 million scheduled passenger flights averaged over three-year periods for scheduled commercial air transport flights only (2009 traffic is based on estimates). Although

FIGURE 3-3

FATAL ACCIDENTS BY TYPE OF COMMERCIAL AIR TRANSPORT OPERATION – THIRD COUNTRY OPERATED AEROPLANES

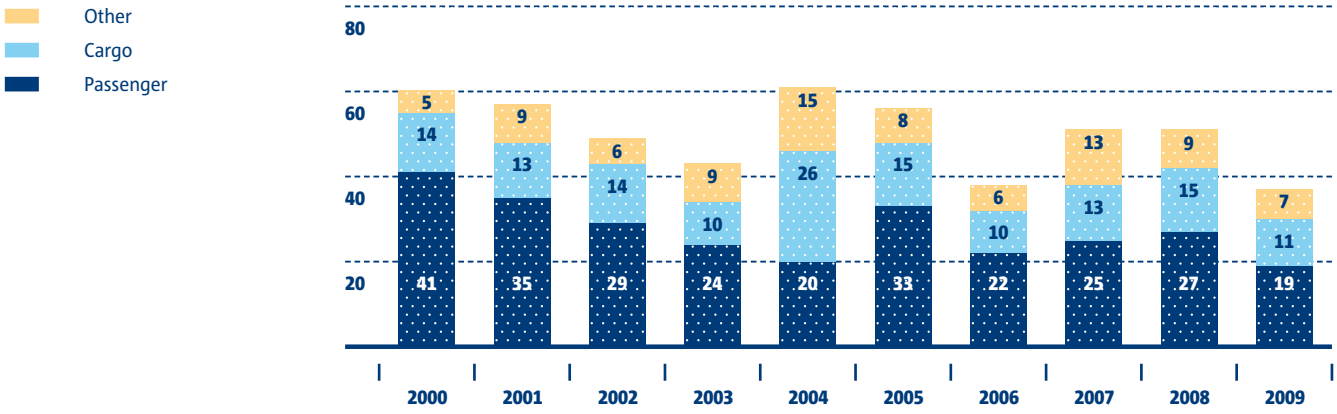
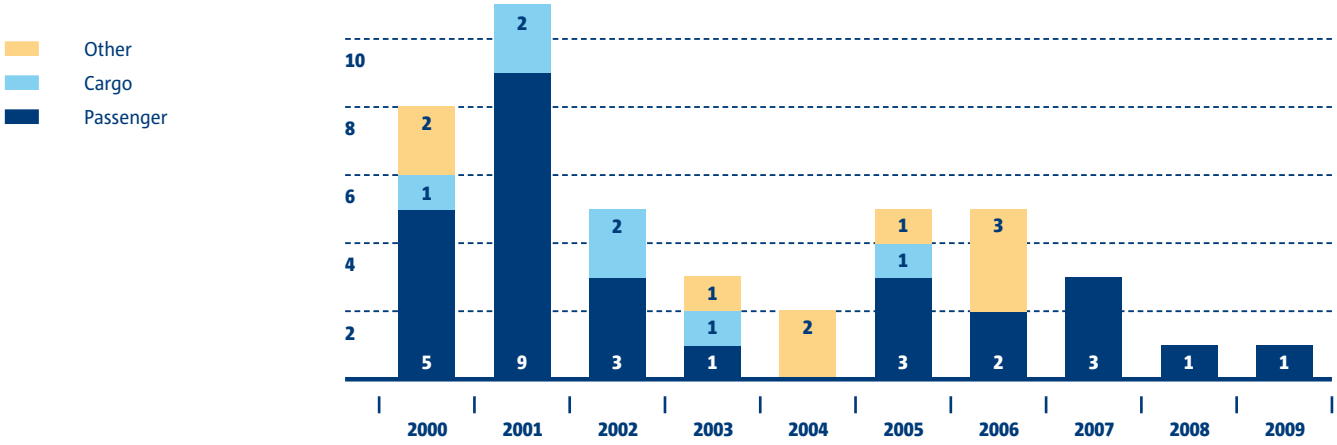


FIGURE 3-4

FATAL ACCIDENTS BY TYPE OF COMMERCIAL AIR TRANSPORT OPERATION – EASA MS OPERATED AEROPLANES



the number of fatal accidents for aircraft operated by EASA MS airlines has remained the same in recent years (one accident), the decrease in the number of flights during the years of 2008 and 2009 has led to an increase in the rate of such accidents.

3.1.2 FATAL ACCIDENTS PER TYPE OF OPERATION

More details emerge when accidents are divided by type of operation. **FIGURE 3-3** shows that worldwide (excluding EASA MS) passenger air transport operations appear to have a declining proportion of the total number of fatal accidents. Other commercial air transport operations, such as air taxi or ferry flights (category: Other) have an increasing proportion of the total. Almost a quarter of all accidents involve aircraft conducting operations under this category. It is worth noting that the proportion of accidents in this category is significantly higher than the proportion of aircraft conducting such operations. Information on the number of flights per type of operation is not available.

For EASA MS, the number of accidents per type of operation is presented in **FIGURE 3-4.** Despite the steadily decreasing number of accidents, in recent years there is an almost constant occurrence of accidents involving passenger air transport operations.

3.1.3 Accident categories

The assignment of accidents under one or multiple categories assists in identifying particular safety issues. Fatal and non-fatal accidents involving EASA MS operated aircraft which occurred during commercial air transport operations were assigned under related accident categories. These categories are based on the definitions developed by the CAST-ICAO Common Taxonomy Team (CICTT)[3]. **Figure 3-5** shows the number of accidents per category for all accidents involving aeroplanes operated by EASA MS airlines in the decade 2000 – 2009.

An accident may be assigned more than one category depending on the circumstances contributing to the accident. As described in **Figure 3-5,** the categories which included a high number of fatal accidents were, amongst others, LOC-I ('loss of control in-flight') and SCF-PP ('system or component failure or malfunction related to the engine').

Events assigned under LOC-I involve the momentary or total loss of control of the aircraft by the crew. This loss of control might be the result of reduced aircraft performance or because the aircraft was flown outside its capabilities for control. SCF-PP involves the malfunction of a single or of multiple engines which might have led to a complete or partial loss of engine power.

Additional observations can be made if the trends of these categories in the past decade are used. **Figure 3-6** presents the percentile share of each accident category in the total number of accidents. In recent years the proportion of accidents which included the categorisation of ARC ('abnormal runway contact') has increased. Such accidents usually involve long, fast or hard landings. Often during such accidents the landing gear or other parts of the aircraft are damaged. Also increasing is the percentile of accidents involving RAMP ('ground handling') events. These accidents involve damage to the aircraft by vehicles or ground equipment or the incorrect loading of an aeroplane. Accidents attributed as 'controlled flight into terrain' (CFIT) appear to have an overall decreasing trend. These accidents involve the collision or near collision of an aircraft with terrain most often under circumstances of limited or significantly reduced visibility.

Note: [3]The CICTT developed a common taxonomy for the classification of the occurrences for accident and incident reporting systems. Further information may be found in Appendix 2: Definitions and acronyms.

FIGURE 3-5

ACCIDENT CATEGORIES FOR FATAL AND NON-FATAL ACCIDENTS – NUMBER OF ACCIDENTS BY EASA MS OPERATED AEROPLANES (2000–2009)

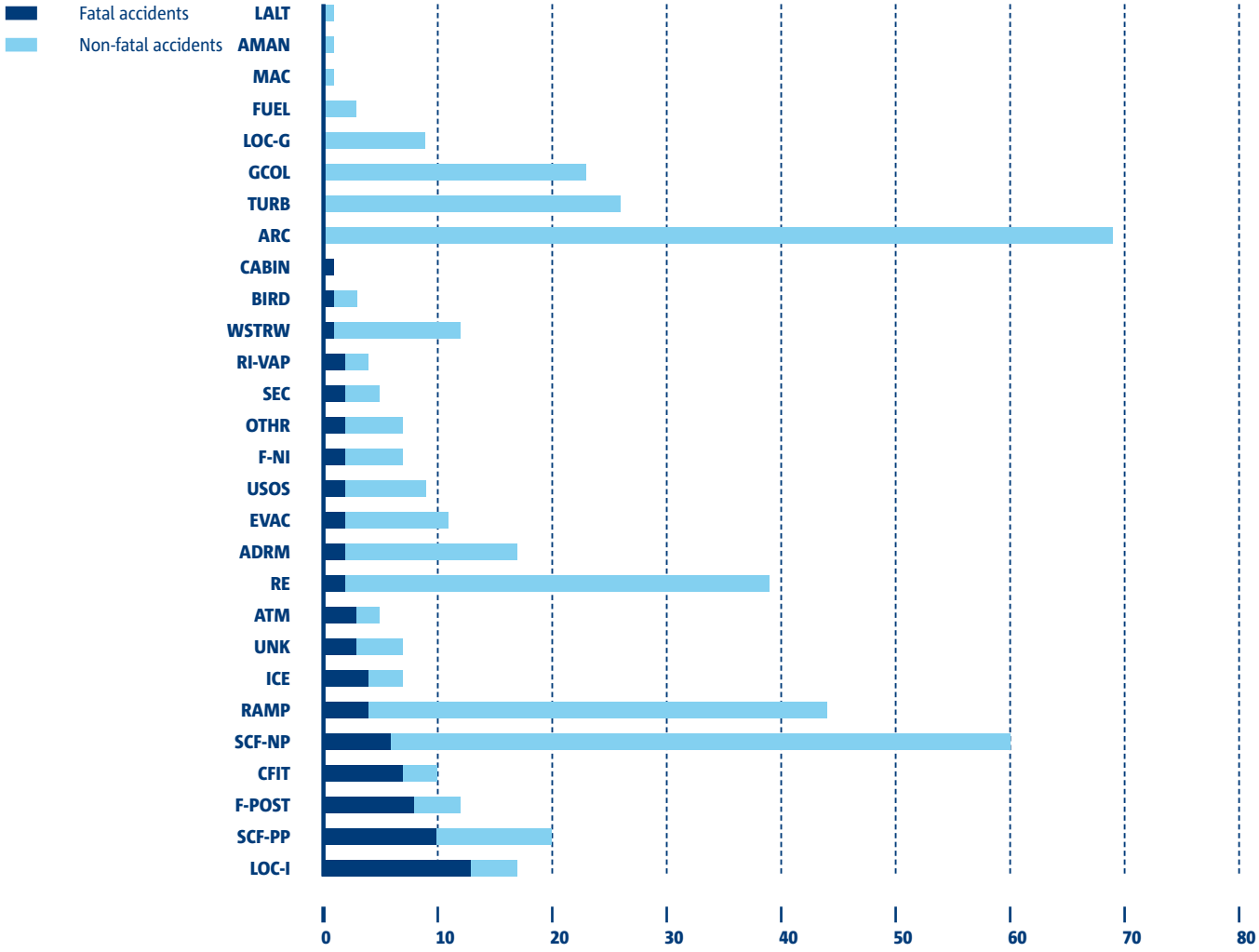
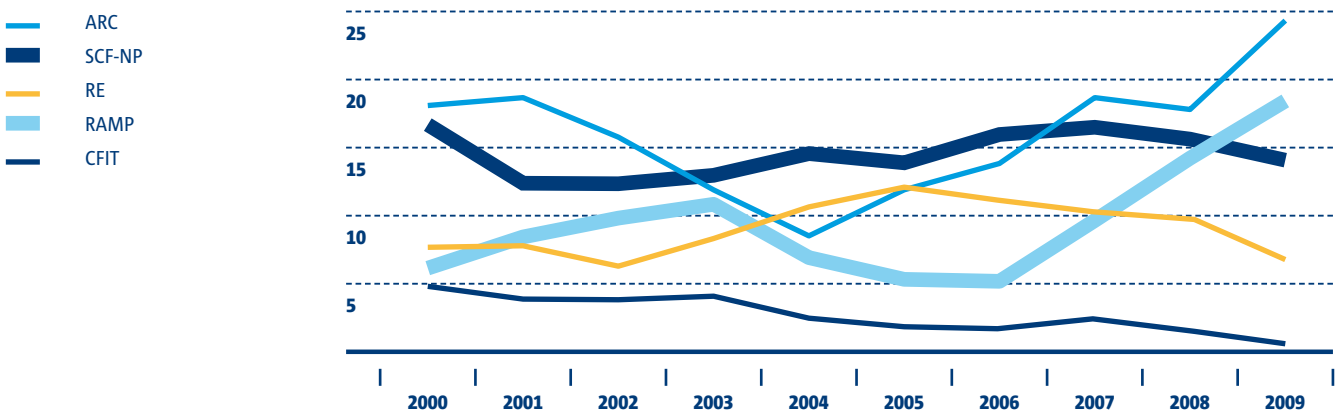


FIGURE 3-6

ANNUAL PROPORTION OF TOP FOUR ACCIDENT CATEGORIES AND CFIT CATEGORY – EASA MS OPERATED AEROPLANES (IN PERCENTILE)



3.2 HELICOPTERS

The following section provides an overview of accidents in helicopter commercial air transport operations (MTOM over 2 250 kg). Comprehensive operation data (e.g. flying hours) was not available for this report.

In general, helicopter operations differ from aeroplane operations **(TABLE 3-2)**. Helicopters often operate close to terrain and take-off or land in areas other than aerodromes, such as helipads, private landing sites and natural landing sites. Also, a helicopter has different aerodynamic and handling characteristics from aeroplanes. All this is reflected in the different accident characteristics.

TABLE 3-2 **OVERVIEW OF TOTAL NUMBER OF ACCIDENTS AND FATAL ACCIDENTS FOR EASA MS OPERATORS (HELICOPTERS)**

Period	Number of accidents	Fatal accidents	Fatalities on board	Ground fatalities
1998–2007 (average)	8	3	11	0
2008 (total)	10	2	4	0
2009 (total)	5	2	18	0

3.2.1 FATAL ACCIDENTS

FIGURE 3-7 presents the number of fatal helicopter accidents for EASA MS and third country operators. Between 2000 and 2009, 24 fatal accidents involving an EASA MS operator occurred compared to 124 fatal accidents involving helicopters operated by third country operators. Overall, fatal accidents with EASA MS operators represent 16 % of the total number of accidents worldwide. For third country operators, the number of fatal accidents in 2009 was low (9 accidents) compared to the average for the decade 2000–2009 (12 accidents).

The number of fatal accidents in 2009 involving helicopters operated by EASA MS operators has remained the same as for 2008 (two accidents) and is equal to the EASA MS average of the decade 2000–2009 (two accidents). Two people died in Poland when an emergency medical helicopter crashed. In April, sixteen people died when a Super Puma crashed during an offshore flight from an oil platform to Aberdeen, Scotland.

When looking at the three-year moving averages, it appears that the number of fatal helicopter accidents worldwide has increased in the last years while the average for EASA MS operators has remained more or less constant.

3.2.2 FATAL ACCIDENTS PER TYPE OF OPERATION

FIGURE 3-8 presents the number of fatal accidents by type of operation. When reviewing the type of operation involved in fatal accidents, a difference can be observed between EASA MS and third country operators.

FIGURE 3-7

FATAL ACCIDENTS IN COMMERCIAL AIR TRANSPORT – EASA MS AND THIRD COUNTRY OPERATED HELICOPTERS

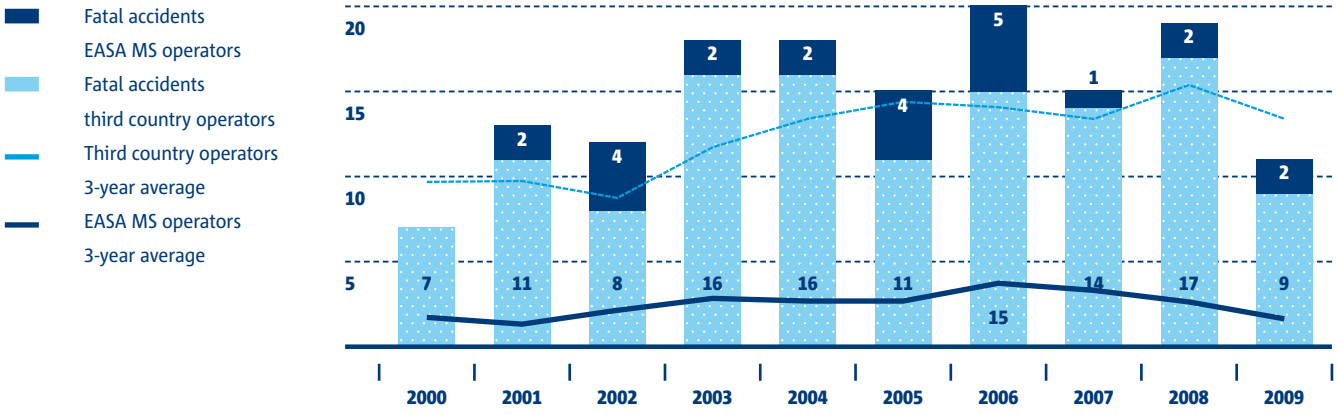
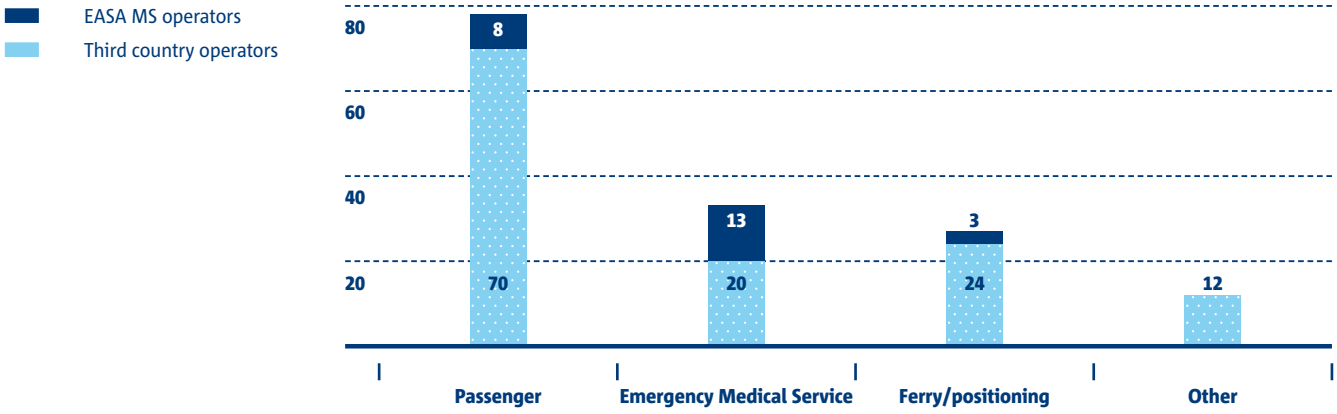


FIGURE 3-8

FATAL ACCIDENTS BY TYPE OF COMMERCIAL AIR TRANSPORT OPERATION – EASA MS AND THIRD COUNTRY OPERATED HELICOPTERS (2000 – 2009)



'Passenger' air transport operation is the main type of operation involved in fatal accidents of third country operators. Most fatal accidents of EASA MS aircraft (13) involved helicopter emergency medical services (HEMS[4]). This represents 39 % of the total number of fatal accidents for helicopter EMS operations worldwide. The category 'Other' includes cargo and air taxi operations.

In the last decade 26 helicopters involved in fatal accidents worldwide were performing an offshore flight (flights to or from an offshore installation). These accidents are included in **FIGURE 3-8**.

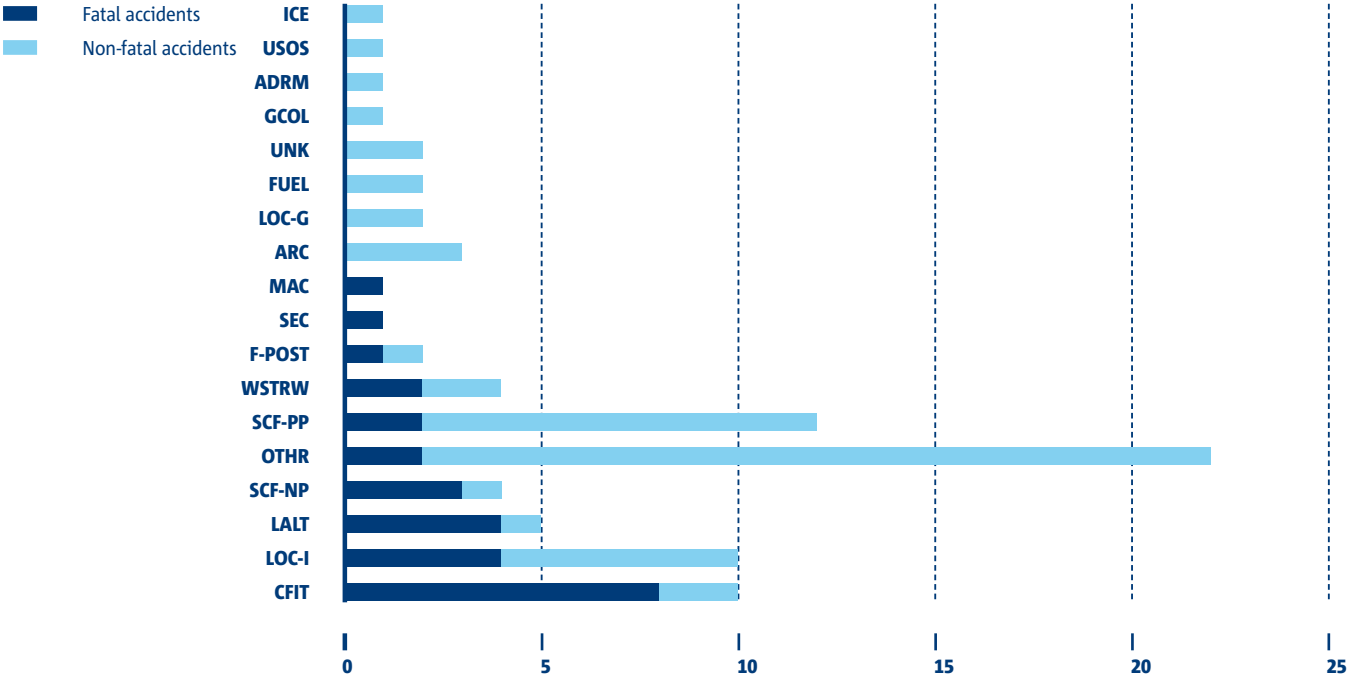
Note: [4] HEMS flights facilitate emergency medical assistance, where immediate and rapid transportation of medical personnel, medical supplies or injured persons is essential.

3.2.3 Accident categories

For this ANNUAL SAFETY REVIEW, the accident categories have also been assigned to fatal and non-fatal helicopter accidents involving EASA MS operators. An accident may be assigned more than one category.

Over the last years, the Agency has continuously attempted to reduce the share of accidents classified as 'Unknown' (UNK). An effort was made in order to obtain additional accident data. In comparison to the ANNUAL SAFETY REVIEW 2008 the number of UNK has been reduced to two accidents, see **Figure 3-9**.

Figure 3-9 **Accident categories for fatal and non-fatal accidents – number of accidents by EASA MS operated helicopters (2000–2009)**



The category with the highest number of fatal accidents assigned is CFIT ('controlled flight into terrain'). In most cases adverse weather circumstances were prevalent, such as reduced visibility due to mist or fog. Also, several flights had taken place at night or over mountainous or hilly terrain.

'Loss of control in-flight' (LOC-I) has the second highest number of fatal accidents assigned and the third highest number of total accidents assigned.

'Low altitude' (LALT) accidents are collisions with terrain and objects that occurred while intentionally flying close to the surface, excluding take-off and landing phases.

The two categories addressing system or component failures and malfunctions are SCF-NP and SCF-PP, for respectively non-powerplant and powerplant failures or malfunctions. The accidents in both categories mainly involve engine, main rotor system, tail rotor system or flight control failures or malfunctions.

The ‘Other’ (OTHR) category is assigned when the accident is not covered under another category. The accidents in this category mainly involved accidents during take-off and landing phases where the main or tail rotor collided with objects on the ground. Helicopters often operate in confined areas close to obstacles. Also, in several accidents the powerful rotor downwash resulted in serious injuries to people on the ground or caused loose objects to damage the helicopter.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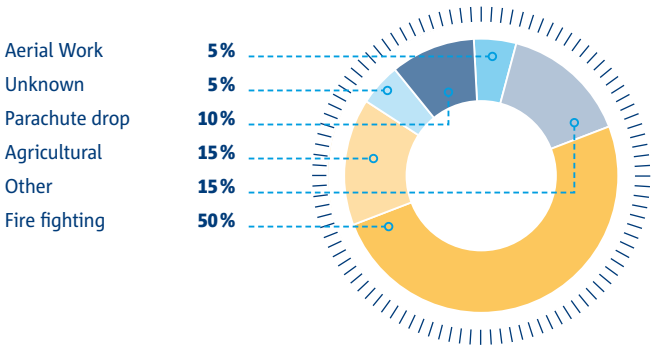
4.0 General aviation and aerial work

This chapter provides data on accidents to aircraft with MTOM over 2 250 kg involved in general aviation and aerial work operations. The information provided in this chapter is based on data obtained from ICAO.

According to ICAO definition 'Aerial work' is an aircraft operation in which an aircraft is used for specialised services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement. 'General aviation' means all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire or aerial work. The distribution of fatal accidents by type of operation is shown below for the decade 2000 – 2009.

FIGURE 4-1 **FATAL ACCIDENTS – AEROPLANES OVER 2 250 KG – EASA MS REGISTERED**

Distribution by type of Aerial Work



Distribution by type of General Aviation

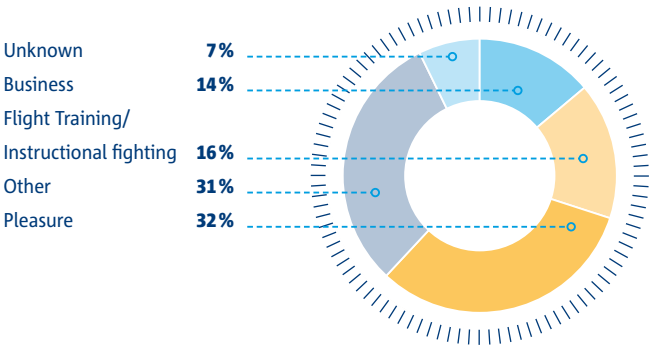
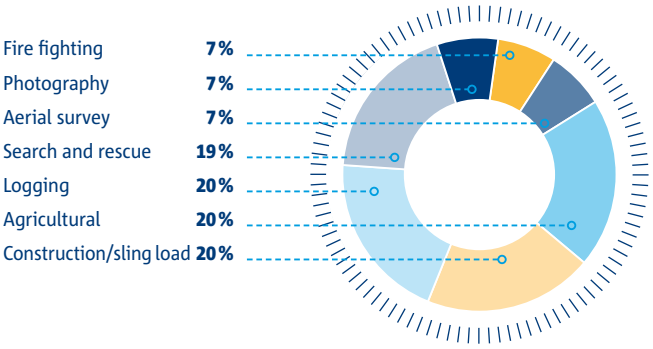
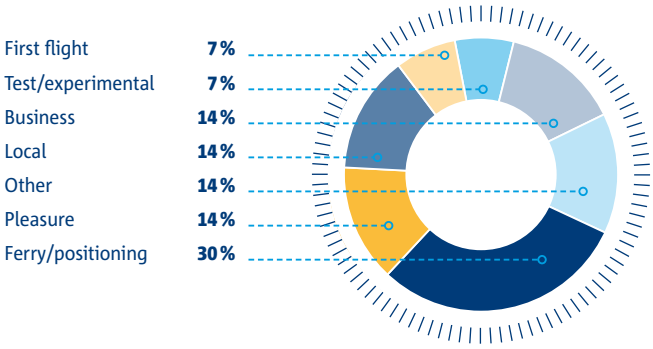


FIGURE 4-2 **FATAL ACCIDENTS – HELICOPTERS OVER 2 250 KG – EASA MS REGISTERED**

Distribution by type of Aerial Work



Distribution by type of General Aviation



In **TABLE 4-1** the time period presented extends from 1998–2009, showing the number of accidents for 2009 and 2008 as well as the average for the decade preceding these years. For the decade 1998–2007 the number of accidents in aerial work operations is similar for both aeroplanes and helicopters.

TABLE 4-1 **AIRCRAFT OVER 2 250 KG – NUMBER OF ACCIDENTS, FATAL ACCIDENTS AND FATALITIES BY TYPE OF AIRCRAFT AND TYPE OF OPERATION – AIRCRAFT REGISTERED IN EASA MS**

Aircraft category	Operation type	Period	Number of accidents	Fatal accidents	Fatalities on board	Ground fatalities
Aeroplanes	General aviation	1998–2007 (average)	16	6	25	0
		2008	19	7	18	1
		2009	12	5	9	0
Aeroplanes	Aerial work	1998–2007 (average)	6	2	4	0
		2008	7	2	3	0
		2009	3	1	2	0
Helicopters	General aviation	1998–2007 (average)	5	2	3	0
		2008[5]	1	0	0	0
		2009	2	2	3	0
Helicopters	Aerial work	1998–2007 (average)	6	2	3	0
		2008	5	1	2	0
		2009	1	1	4	0

Note: [5]Two accidents to helicopters in General aviation that occurred in 2008 were reclassified based on more recent data: one was determined to be performing commercial air transport operations, in the other accident the helicopter was operated illegally and was not registered.

4.1 Accident categories – General Aviation (aeroplanes)

It was observed that not all general aviation accidents obtained from ICAO had been classified in terms of accident categories. Consequently, the numbers presented provide a low estimate of the frequency for all accident categories. All data refer to the decade 2000–2009.

Figure 4-3 shows that 'Loss of control in-flight' is the most important category regarding fatal accidents. There were several fatal accidents with 'Unknown' accident category indicating that there was insufficient data to permit classification. 'Abnormal runway contact' and 'System component failure – non powerplant' are the most important non fatal accident categories. It means that technical issues played a role but the accident outcome was often less severe. A similar observation is made regarding 'Abnormal runway contact'.

Figure 4-3 Accident categories for fatal and non-fatal accidents – General Aviation – aeroplanes over 2 250 kg – aircraft registered in EASA MS (2000–2009)

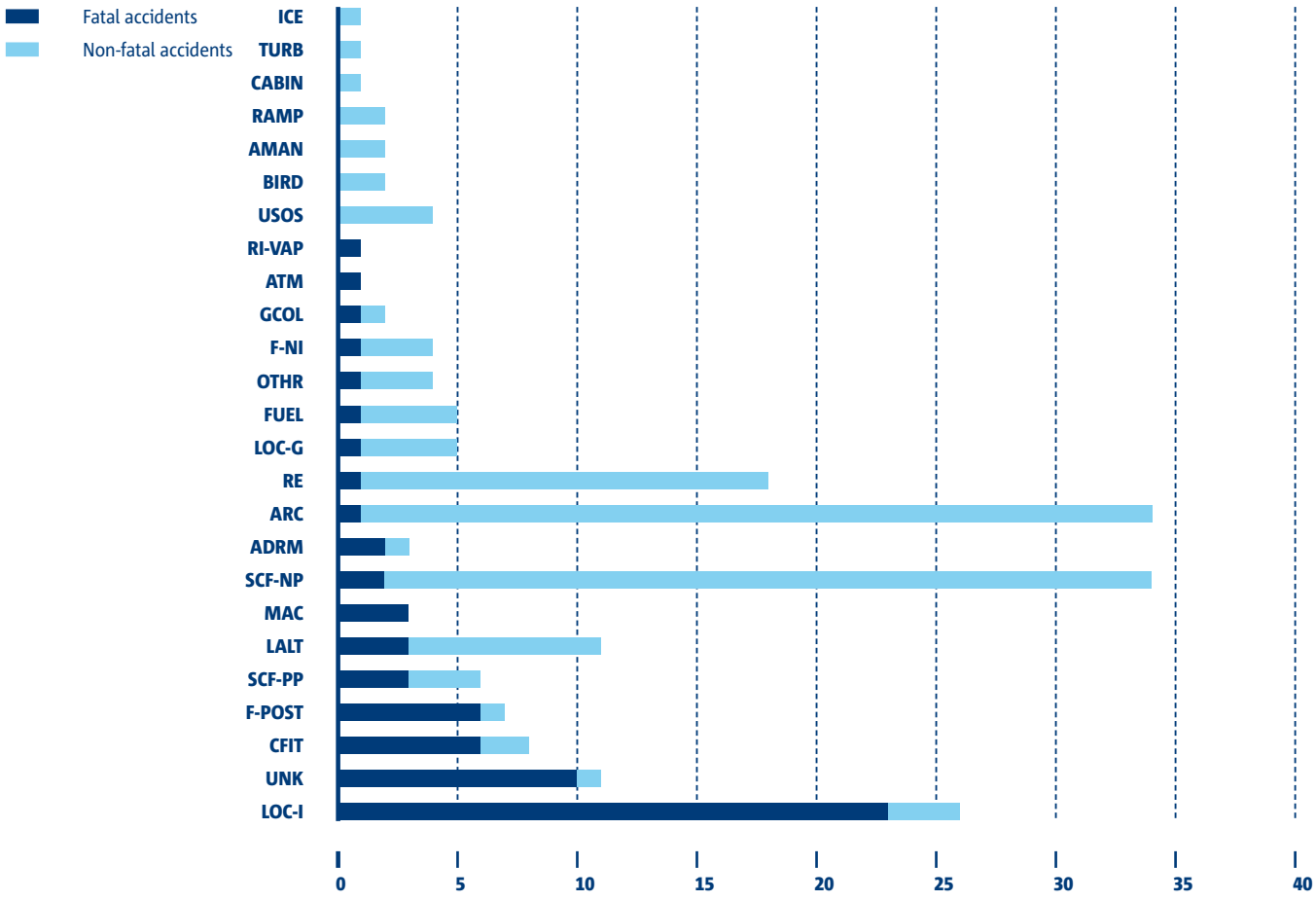
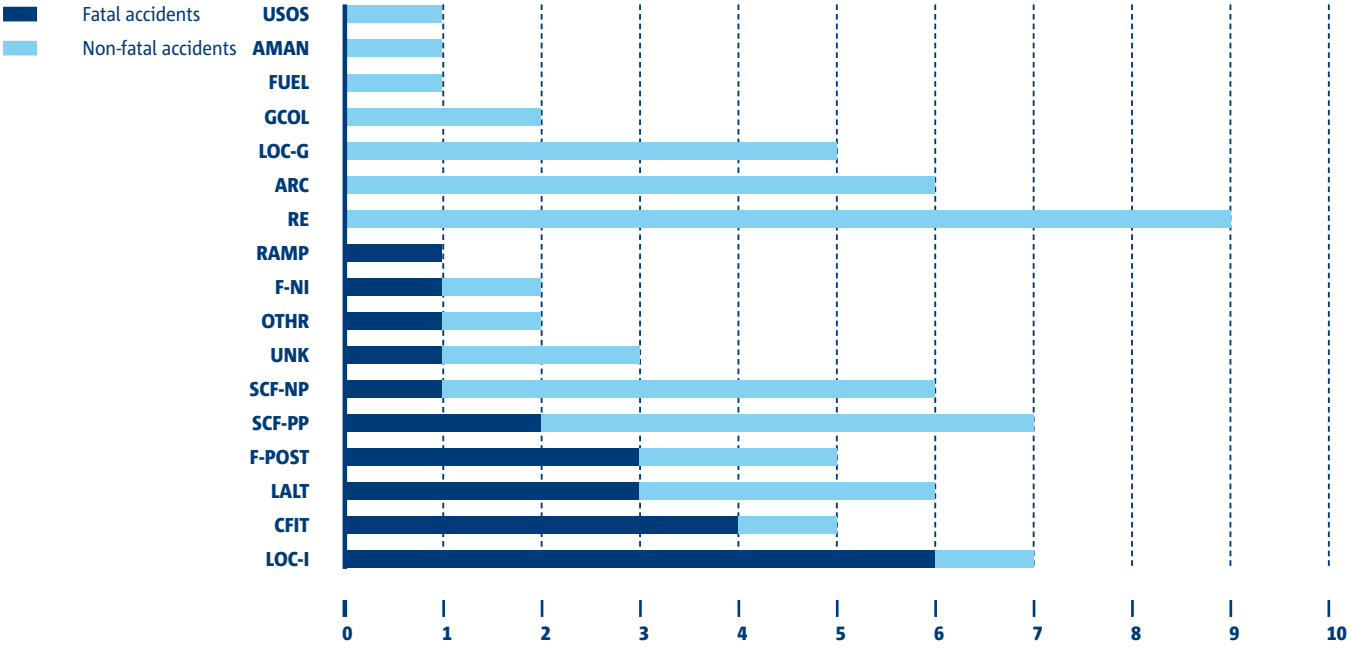


FIGURE 4-4 **ACCIDENT CATEGORIES FOR FATAL AND NON-FATAL ACCIDENTS – AERIAL WORK – AEROPLANES OVER 2 250 KG – EASA MS REGISTERED**



4.2 ACCIDENT CATEGORIES – AERIAL WORK (AEROPLANES)

There is a particular problem in obtaining data related to accidents in aerial work. One of the most hazardous types of aerial work operation in this regard is related to fire fighting. This activity may be performed by commercial operators but also by State organisations (e.g. the Air Force) as 'State flights'. 'State flights' were not included in this review.

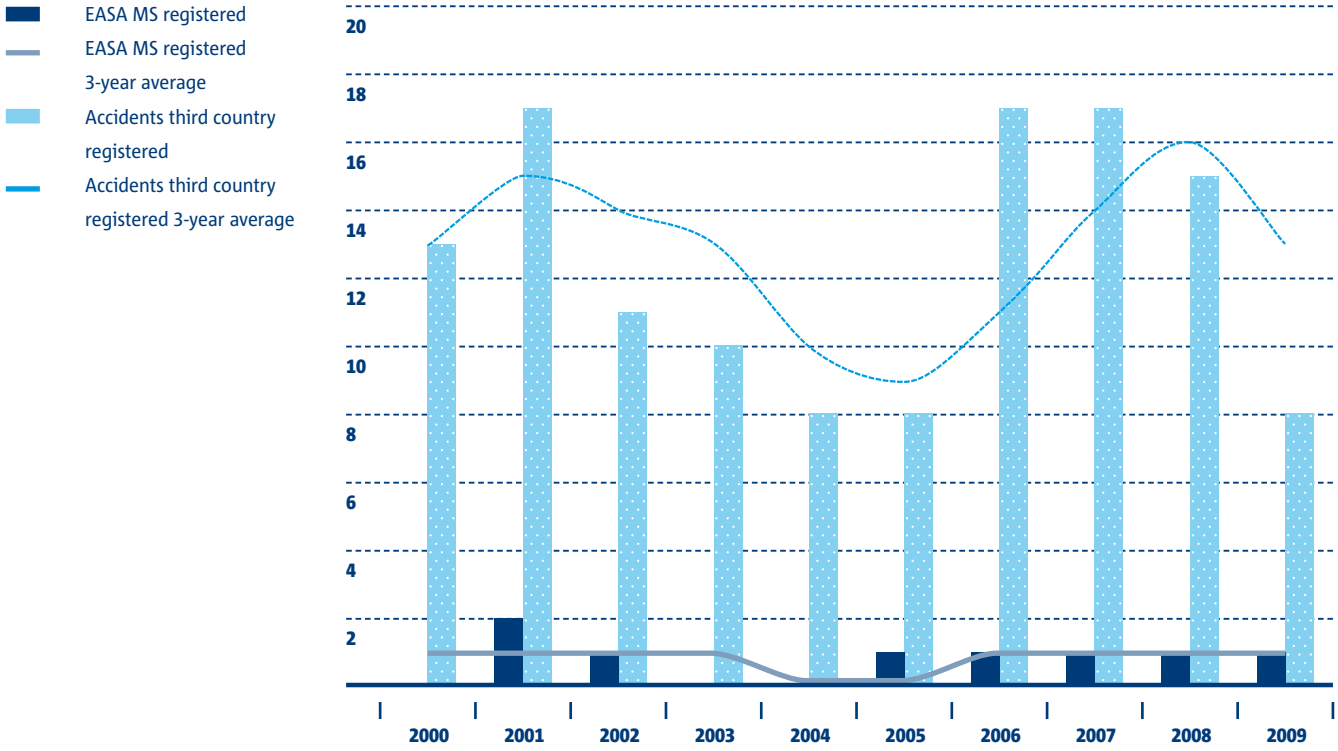
FIGURE 4-4 presents 'Loss of control in-flight' as the most important fatal accident category, which is followed by 'Controlled flight into or towards terrain', 'Low altitude operations' and 'Fire post impact'. 'Runway excursion' was the most important aerial work accident category for non fatal accidents.

4.3 BUSINESS AVIATION

According to ICAO, 'Business aviation' comprises flights with intention to carry company personnel, including corporate operations. 'Business aviation' is considered a subset of 'General aviation' operations. The data on 'Business aviation' are presented in this document in light of the importance of this sector.

In recent years, there was one accident annually in EASA MS. Worldwide the number of fatal accidents in 2009 has returned to the level of 2004 and 2005. The reasons for the reduction could not be determined.

FIGURE 4-5 **FATAL ACCIDENTS IN BUSINESS AVIATION – EASA MS AND THIRD COUNTRY REGISTERED**



5.0 Light aircraft, aircraft below 2 250 kg MTOM

EASA started requesting data on light aircraft accidents from 2006 onwards. In January 2010 the Agency requested data for accidents concerning the year 2009. The last set of data was received on the 23rd March 2010. Data were missing from Cyprus, Liechtenstein and Malta. Two countries, Latvia and Luxembourg, informed that no accidents occurred in 2009.

Some States provided some revised data for previous years; 17 provided data for 2008. Reporting by States is uneven. The basic understanding of occurrence coding varies. The level of completeness of the fields necessary for making the statistics and the level of quality of coding the accident categories, events, etc., also shows appreciable variation.

Regarding the aircraft category, some EASA MS provided data for accidents to parachutists, para-motors and hang-gliders; some used a mass limit of 1 000 pounds to delineate 'micro-light' aircraft from 'normal' aeroplanes, but the majority did not. The use of the limits set in Regulation (EC) 216/2008 Annex II paragraph (e) would have mitigated this uneven classification. Basic data like the aircraft mass group or the injury level was missing and in other cases it was wrongly allocated.

In total, the States reported 1 234 accidents in 2009, 163 of them were fatal. The number of fatalities was reported as being 253, which is shown in **TABLE 5-1**. The figures have been averaged for the period 2006–2008 to compare with the data pertaining to 2009.

It can be observed that all the figures in 2009 are of the same order of magnitude as the average of the three previous years. The number of accidents, fatal accidents and fatalities all increased in 2009; the small decrease in balloons and aeroplanes was more than compensated by the increase in the remaining aircraft categories. In sum, accidents increased in 2009 by about 6 %, fatal accidents by 12 % and fatalities on board aircraft by 8 % (approximately). The increase may be partly explained by the fact that data for a larger State had not been reported for the year 2008 ASR.

TABLE 5-1 **ACCIDENTS, FATAL ACCIDENTS AND RELATED FATALITIES – AIRCRAFT WITH A MASS BELOW 2 250 KG, BY YEAR AND AIRCRAFT CATEGORY, EASA MS REGISTERED**

Aircraft category	Period	Number of accidents	Fatal accidents	Fatalities on board	Ground fatalities
Balloon	2006–2008	23	0	0	0
	2009	20	0	0	0
Aeroplane	2006–2008	536	63	118	1
	2009	528	62	118	2
Glider	2006–2008	186	18	19	0
	2009	213	20	25	0
Gyroplane	2006–2008	10	3	3	0
	2009	12	1	2	0
Helicopter	2006–2008	79	8	18	1
	2009	95	15	28	2
Microlight	2006–2008	211	33	48	0
	2009	225	45	60	0
Other	2006–2008	64	9	11	1
	2009	67	12	12	0
Motorgliders	2006–2008	51	10	15	0
	2009	74	8	8	0
(Average)	**2006–2008**	**1,160**	**145**	**234**	**3**
(Total)	**2009**	**1,234**	**163**	**253**	**4**
Increase (%)		**6.3 %**	**12.4 %**	**8.3 %**	**20.0 %**

Note: Numbers for period 2006–2009 are average of three years. Data as reported to EASA.

5.1 Fatal accidents

The great majority of accidents reported occurred in General aviation. The vast majority of the light aircraft in EASA MS is involved in General aviation **(Figure 5-1)**. Some of them, in particular light helicopters, are also involved in Aerial work, (e.g. aerial observation activities) and a very small proportion, in commercial air transport. In respect to the type of operations, around 4 % of the fatal accidents were not coded by the States but it was observed by sampling that they concerned mostly General aviation.

The majority (42 %) of light aircraft involved in fatal accidents during the period 2006–2009 are aeroplanes **(Figure 5-2)**. Microlights are involved in half as much, with 24 %. Balloons are very seldom represented in fatal accidents; in fact there is just one case in the four years covered in this study. The non-uniform categories assigned to the aircraft (e.g. microlight, aeroplane or gyroplane) may have caused a slight distortion in the grouping; this is due to differences in the classification applied by the States and sometimes may have been caused by a misclassification.

Figure 5-1 Fatal accidents by type of operation – Aircraft below 2 250 kg, EASA MS registered (2006–2009)

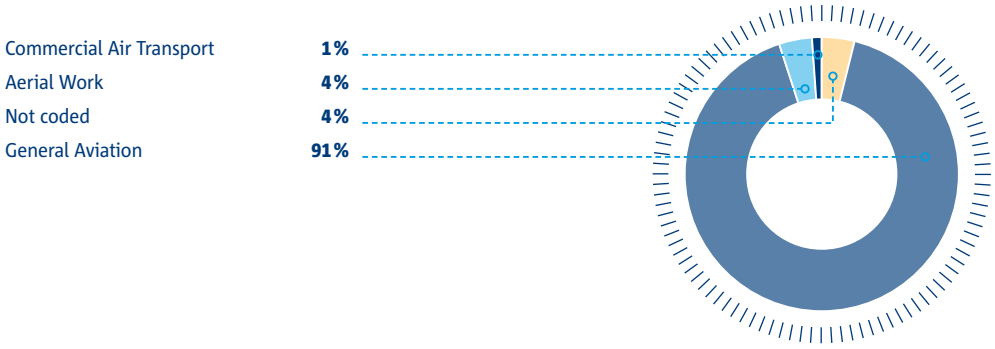
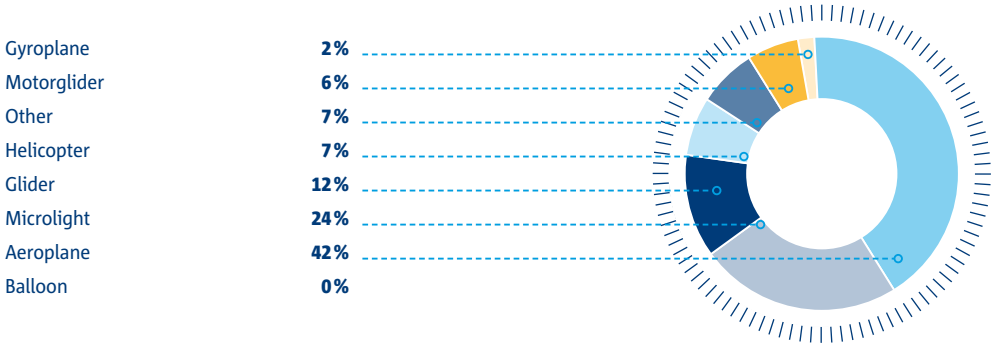


Figure 5-2 Fatal accidents by aircraft category – Aircraft below 2 250 kg, EASA MS registered (2006–2009)



5.2 Accident categories

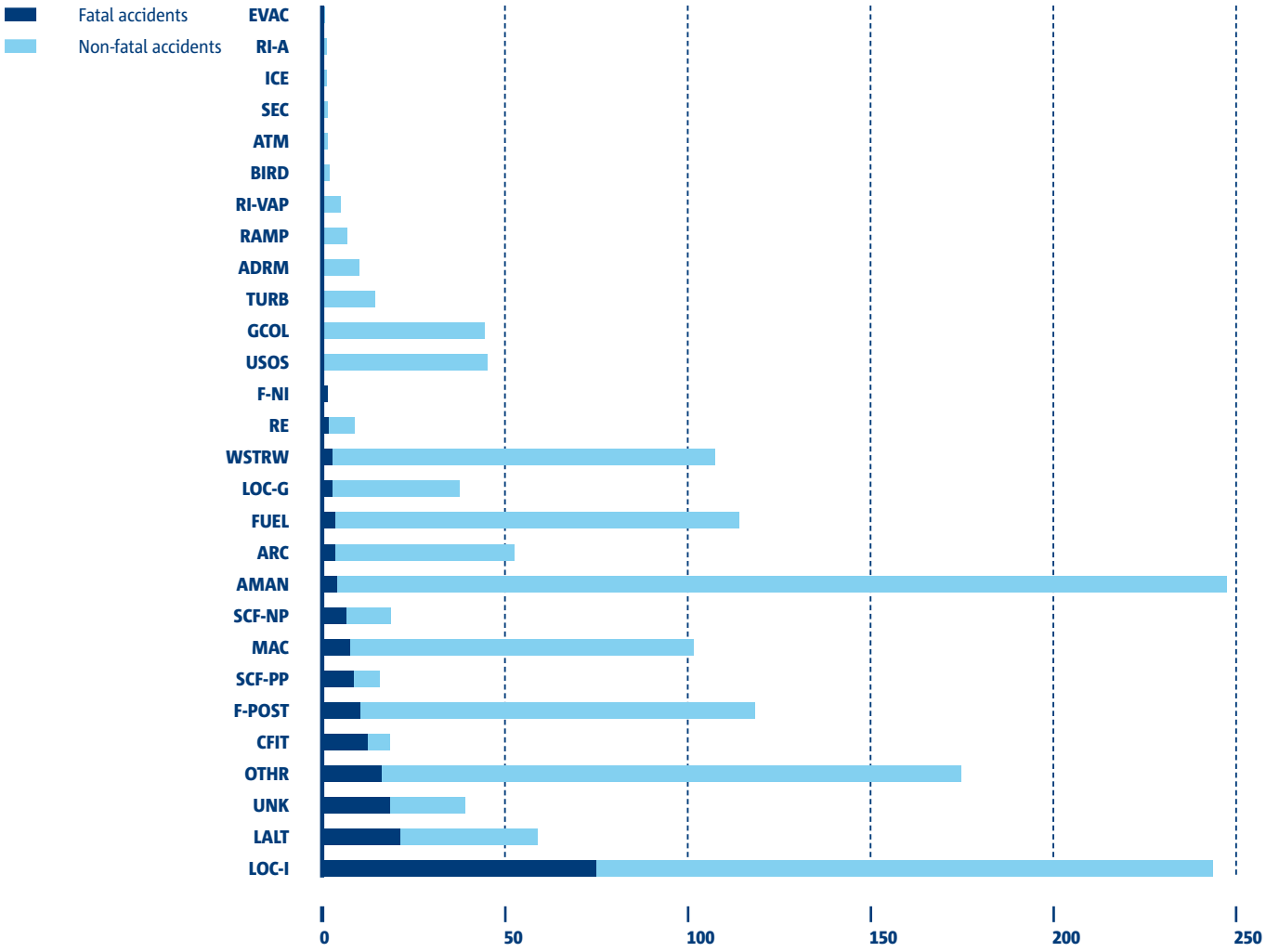
The CAST-ICAO Common Taxonomy Team (CICTT) accident categories were applied by the reporting States to the set of light aircraft data accidents for the period 2006–2009.

Analysis was based on data received for the years 2006 to 2009. The results, as already mentioned, might suffer from the non-uniform coding of occurrences by the States.

The highest number of fatal accidents were classified as LOC-I 'Loss of control in-flight' and LALT 'Low altitude'. LOC-I is also one of the most significant categories in non-fatal occurrences. These LOC-I and LALT categories also show a high proportion of fatal accidents relative to number of total accidents in the respective category.

The UNK 'Unknown' category is the third most frequent in fatal accidents. In this analysis it may mean that, as per definition, the category could not be determined during the investigation; in many cases it means that it was not provided by the State because the

Figure 5-3 **Distribution of accident categories – Aircraft below 2 250 kg, EASA MS registered (2006–2009)**



investigation was not finished. The UNK category represents about 10 % of the fatal accidents, which could be reduced if the investigations were carried on to the end.

The fourth most important category is OTHR 'Other'. This results from the incomplete coverage given by the taxonomy to light aircraft, in particular in aircraft categories 'Gliders' and 'Balloons', where the classification in an existing category is often impossible.

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 in the great majority of the States. Data regarding gliders, balloons and aircraft like the so-called 'homebuilt' are also not recorded, or, in several countries, entrusted to associative organizations and not retrieved by the Member States. Data for microlight (including microlight aeroplanes, helicopters, gyroplanes and gliders) are usually entrusted to the aircraft owner, who very seldom provides it to the authorities.

An accurate estimate of flight hours or movements is needed to allow a more meaningful analysis of data, than the number of accidents alone can provide. This has been possible for many years for large aircraft.

With only four years of data available no trend could be developed. Further, analysis of the causes was limited by the lack of related data from States. Many records regarding the period 2006–2008 were not revised by the States and the data that was incomplete in previous years remains so. Timely availability of complete data is essential for the Agency to be able to provide a complete picture of all aspects of aviation safety in Europe.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6.0 The European central repository

The centralised database – the European Central Repository for occurrences (ECR) has been established by the Joint Research Centre of the European Commission as part of the ECCAIRS project in order to collect information on safety related occurrences collected in EASA States in accordance with Directive 42/2003. EASA Member States are obliged to integrate these occurrence data into the ECR according to Commission Regulation (EC) No 1321/2007.

Table 6-1 **The States integrating their data in the ECR in alphabetical order – situation at the end of 2009**

BELGIUM	FINLAND	ICELAND	POLAND
BULGARIA	FRANCE	LATVIA	SLOVAKIA
CYPRUS	GERMANY	LITHUANIA	SPAIN
DENMARK	GREECE	THE NETHERLANDS	SWEDEN
ESTONIA	HUNGARY	NORWAY	UNITED KINGDOM

The first EASA Member State which started integrating its data into the ECR was Iceland in January 2008. At the end of 2009, twenty States integrated their data **(Table 6-1)**.

6.1 THE ECR AT A GLANCE

By the end of 2009 the ECR contained 275 646[6] occurrences. The distribution of occurrences per year is presented in **FIGURE 6-1** for the growing number of occurrences as the result of additional States integrating their occurrence data into the ECR. Some States have provided their historical data[7] while others are integrating only the occurrence data reported after the date the integration was started.

According to the **FIGURE 6-2**, the majority of the occurrences were reported for Commercial air transport operations. 57 % of records have no information regarding operation type. According to **FIGURE 6-3**, most reports where this information was provided concern aeroplanes. The white slice indicates that for 65 % of records the category of aircraft was not reported.

The majority of occurrences, where the mass of the aircraft was reported, were reported for aircraft belonging to the 27 001 to 272 000 kg mass group. In 71 % of records the mass group was not reported **(FIGURE 6-4)**.

FIGURE 6-1 DISTRIBUTION OF OCCURRENCES PER YEAR – ECR

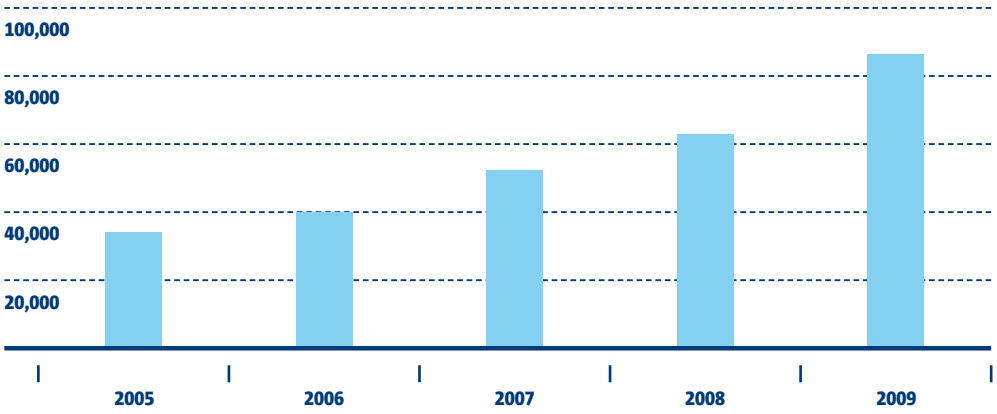
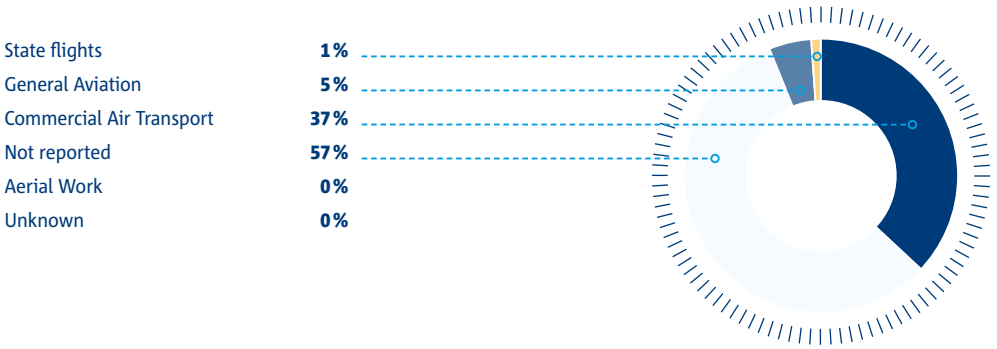


FIGURE 6-2 DISTRIBUTION BY OPERATION TYPE – ECR



Note: [6] This figure is indicative and it may change after the rest of States will commence data integration process.
[7] The date of occurrence is before the actual date of the commencement of the data integration process.

FIGURE 6-3 **DISTRIBUTION BY AIRCRAFT CATEGORY – ECR**

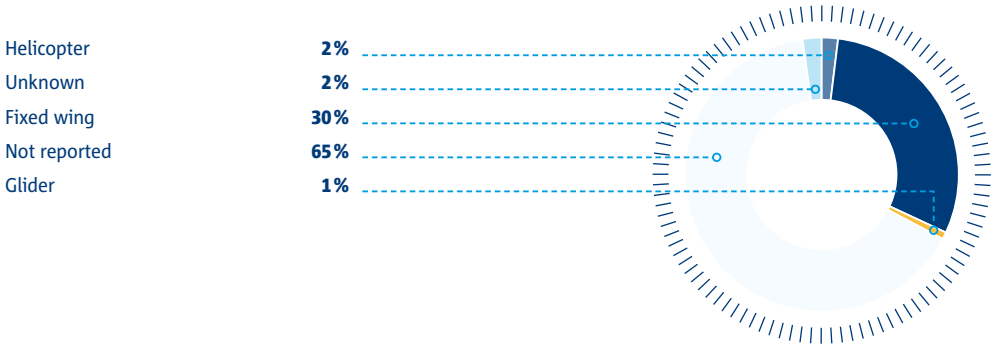


FIGURE 6-4 **DISTRIBUTION BY MASS GROUP – ECR**

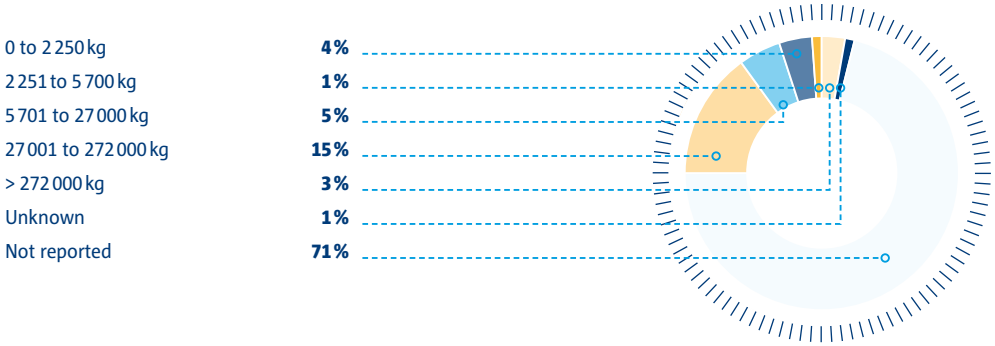


FIGURE 6-5 **DISTRIBUTION OF OCCURRENCES BY SEVERITY – ECR**

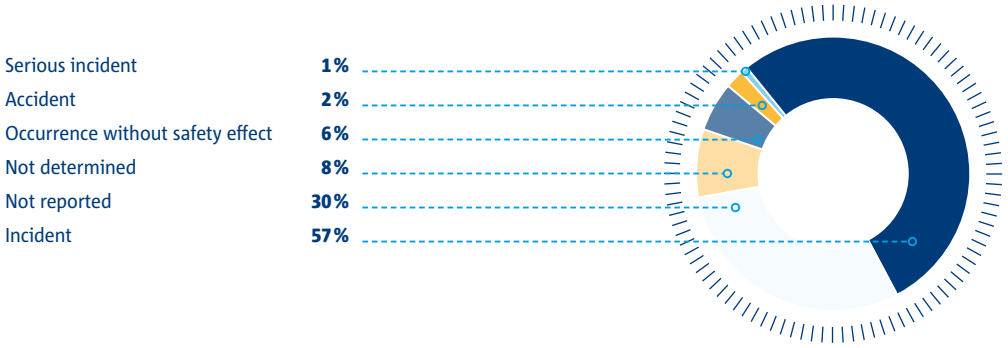


FIGURE 6-5 depicts the distribution of occurrences by the severity of the occurrence. Most of occurrences where the severity was reported, have been classified as incidents. In 30 % of the reports, the severity of the occurrence was not reported.

FIGURE 6-6 presents the top 10 accident categories according to the ECR data. The majority of occurrences were categorised as 'ATM/CNS', 'Other', and 'System/component failure' or 'malfunction [non-powerplant]'. The occurrence category was reported in 55 % of all records in the repository.

Critical events during the occurrence are coded based on the event type. Events are reported in chronological order. Distribution by the first event is shown in **FIGURE 6-7**. In most cases, the first event types are 'Aircraft operation general', 'Aircraft/system/component', and 'Air Navigation services'. There are 51 % of records, where event information was not reported.

FIGURE 6-6 THE TOP 10 ACCIDENT CATEGORIES – ECR

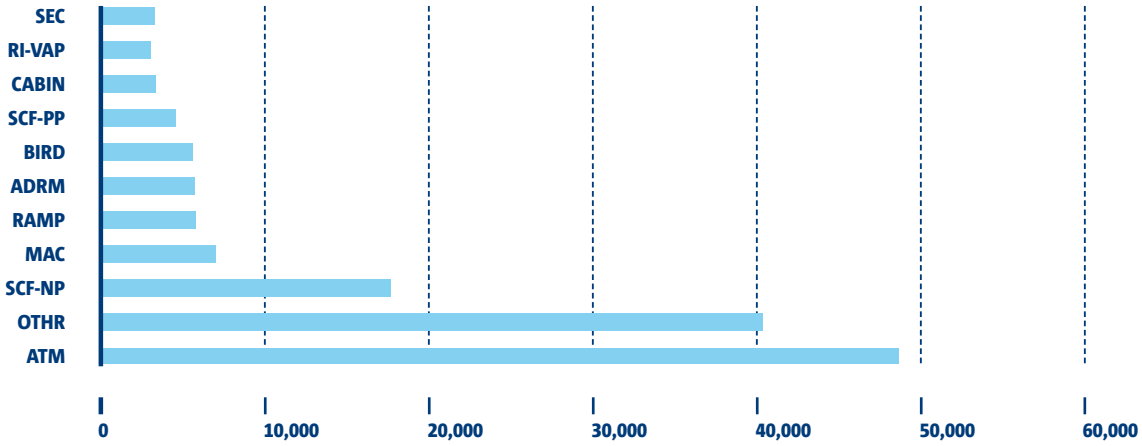


FIGURE 6-7 DISTRIBUTION BY THE FIRST EVENT – ECR

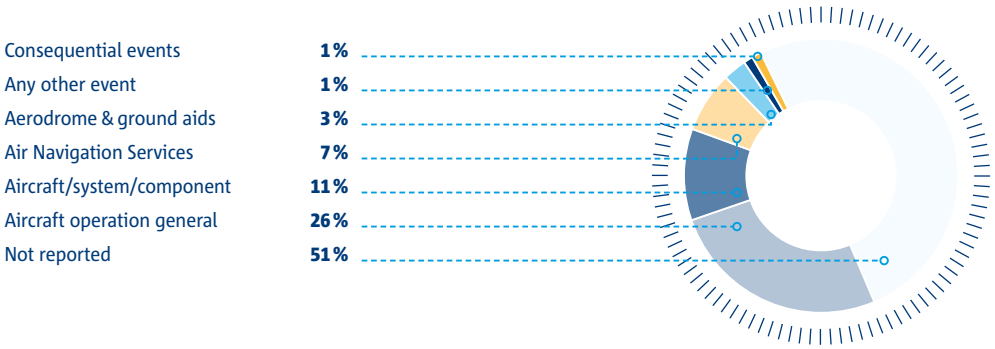


FIGURE 6-8 **DISTRIBUTION BY MASS GROUP PER ACCIDENT CATEGORY – ECR**

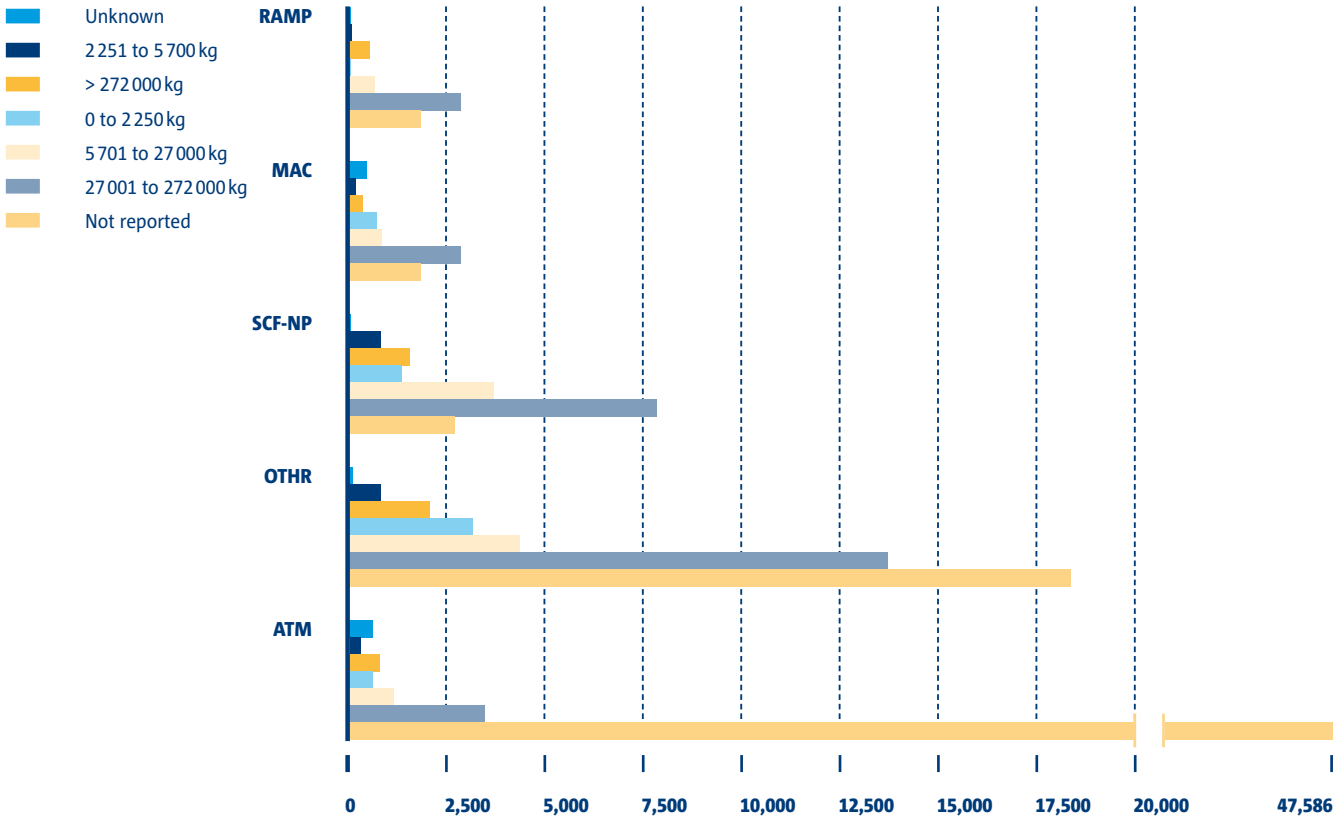


FIGURE 6-8 represents the top 5 accident categories divided by aircraft mass group. The white bars indicate the records with mass group information not reported. It would appear that there is a systematic problem related to the reporting of the aircraft mass group in conjunction with occurrences classified as 'ATM/CNS' .

6.2 CONCLUSIONS

This is the first time that data from Europe on occurrences could be reviewed. Thus, the efforts to set up the system to collect data on a wide scale start to show results. Nevertheless, challenges remain. The ECR can be compared to a large mosaic made from small pieces (occurrences) supplied by the reporters. If a significant number of pieces are left blank or are wrong there can be no clear indication of the overall status of safety.

For instance the event type is not reported for 51% of the ECR records, the aircraft category is not mentioned 65% of records, the mass group of aircraft is not listed in 71% of records, and the type of operation is not reported for 57% of records.

Efforts will have to be made at all levels to enhance the data quality.

The effective use of the data is hindered by restrictions to access them: narratives and notes are not available, preventing the verification of the accident categories and event types assigned. Registrations of aircraft are missing preventing a verification of the aircraft types and characteristics reported.

7.0 Agency's safety actions

7.1 Approvals and Standardisation

The Agency's standardisation inspections performed during 2009 further confirmed the maturity of the standardisation process for the areas of Initial and Continuing Airworthiness where Commission Regulation (EC) No 736/2006 provides a robust framework for the monitoring of Member States' implementation of the EASA Basic Regulation (EEC) No 216/2008 and related Implementing Rules (Regulations 2042/2003 and 1702/2003). However, the experience gathered during recent years indicates a need for a revision of the Commission Regulation (EC) No 736/2006 not only to streamline the process but also to cover the introduction of the second and third extension of the Agency's remit.

In the areas of Flight Crew Licensing, Air Operations and Flight Synthetic Training Devices where Implementing Rules have not yet been issued, EASA continued JAA's standardisation activities in accordance with the FUJA II report. After disbandment of JAA on 30th June 2009, in the case of the EASA States (EU Member States, Iceland, Norway, Switzerland and Liechtenstein), standardisation inspections were performed by the Agency, based on a signed agreement between the European Commission and EASA. This agreement suggests the use of some working methods used under Commission Regulation (EC) No 736/2006. With several other Civil Aviation Authorities, i.e. those of ECAA countries and other former JAA Member States, EASA signed working arrangements aiming, amongst other things, for the continuation of standardisation activities based on the principles established under Commission Regulation (EC) No 736/2006.

In the areas of Initial (IAW) and Continuing Airworthiness (CAW) the number of inspections has remained stable (IAW: 13 versus 13) or increased compared to 2008 (CAW: 32 against 26). The IAW domain confirms the status of the previous years, showing a satisfactory and uniform level of understanding and implementation in all countries involved. In the CAW domain, where all Member States exercise their competences, the uniform and proper implementation of the rules still needs further efforts.

Whilst the number of non-conformity findings per number of inspection has slightly decreased in IAW, it has increased in CAW. This is mainly due to specific regulatory opt-out provisions which expired in September 2008 and in September 2009, causing some ill prepared Member States to become non-compliant.

In 2009 EASA started to put more emphasis on a pro-active standardisation approach. In this regard the direct involvement of national experts in EASA standardisation inspections has been further promoted. Most of the competent authorities, including those of the newly associated states, supported actively the process in its execution and in providing EASA with resources for the standardisation teams. Another initiative by the Agency in support of a pro-active standardisation approach was the organisation of Standardisation Meetings in each area. The overall experience with these meetings was very positive.

A new concept, called 'Continuous Monitoring Approach (CMA)', entailing a risk based planning tool is under development that would allow to tailor the size of the teams, the scope, the depth and the interval of standardisation inspection visits to identified risks, thereby optimizing the process and use of resources.

In the domain of training, EASA has launched an initiative open to all training managers of the NAA to identify common qualification criteria and to satisfy common training needs for all types of inspectors. This initiative is now consolidated in a permanent group, which meets at regular intervals. The Agency is continuing to open its courses on EU regulations to all NAA and to third countries' authorities, in coordination with the International Cooperation department of Rulemaking.

The organisation approvals activity in the domain of Design Organisations (DOA), Continuing Airworthiness (- Maintenance) Organisations (CAO) and Production Organisations (POA) has developed further in 2009. Despite of the global economic crisis, the number of initial approvals has increased: the Agency now ensures surveillance of 254 Design Organisations and 223 Holders of Alternative Procedures to DOA inside and outside of Europe, 254 Maintenance Organisations and 33 Maintenance Training Organisations outside Europe, 16 Production Organisations outside Europe and the EASA Single Production Organisation Approval of Airbus in Europe and China. All the listed activities have been performed by EASA staff, supported by contracted European NAAs and partially seconded NAA staff in the DOA and POA domain. In addition the Agency ensures the continued validity of 1303 EASA Maintenance Organisations in the US and 148 EASA Maintenance Organisations in Canada, based on the continuing surveillance of the FAA and Transport Canada.

The SAFA (Safety Assessment of Foreign Aircraft) activity was inherited from the JAA on 1 January 2007. The activity to be carried out by the Agency is a coordination function, comprising the following elements: Maintaining the database of reports from SAFA ramp inspections; providing analysis and reports on the collected data; fostering the organization and implementation of training courses; providing proposals for manuals and procedures; performing the standardization of SAFA activity.

In accordance with the established schedule (every 4 months), the Agency has performed the SAFA quality review and the regular SAFA analysis which was distributed to all SAFA participating states and the European Commission. In addition, on request of the European Commission several ad-hoc analyses were conducted supporting various individual cases. Following the SAFA regular analysis prioritization lists were compiled and distributed to all National Coordinators in the SAFA participating states. The analysis of the SAFA data has been delivering important indicators concerning the overall safety level of airlines operating in Europe, which helps identifying potential risk factors and direct qualitative targeting. The SAFA Standardisation Programme was initiated in 2009 following the methodology of Commission Regulation 736/2006 for conducting standardisation inspections. Together with detailed guidance material for SAFA Ramp Inspections published also in 2009, this ensures a high degree of harmonization among the participating States.

7.2 Certification

The Certification Directorate directly contributes to aviation safety by conducting certification activities leading to the EU-wide approval of aeronautical products, parts and appliances on the highest possible safety level. In this respect, an aeronautical product can only receive its design approval when it complies with all applicable safety requirements. In total, the Agency issued 4409 design-related certificates in 2009.

Following the initial certification, another main task for the Certification Directorate is to actively monitor the continuing airworthiness of aeronautical products, parts and appliances during their entire lifecycle. The Certification Directorate has therefore established a thorough continuing airworthiness process, aiming at preventing unsafe conditions and accidents. This process is based on data provided through occurrence reporting, accident or incident

investigations, type design reviews and various other activities. As an example, the AF 447 accident in June 2009 triggered intense continuing airworthiness activities, including test series and other actions in close cooperation with the concerned design organisations.

On the basis of the investigation and analysis of the Certificate Holder, or of on any other relevant information, EASA defines appropriate actions that may lead, in case of determination of an unsafe condition, to issuance of Airworthiness Directives (AD's) to mandate appropriate corrective actions.

In 2009, the Agency mandated 304 ADs including 60 Emergency ADs. The "Airworthiness Directives, Safety Management & Research" Section within the Certification Directorate provides for consistency of the continuing airworthiness process.

Additional actions are performed, such as the implementation of Airworthiness Information Networks with Civil Aviation Authorities which have validated EASA certificates for major European products. Regular continuing airworthiness meetings with manufactures and foreign authorities take place addressing potential safety issues. All this is part of the Agency's and Certification Directorate's approach to closely cooperate with European and non-European stakeholders.

Regular audits by independent parties (such as ICAO) confirmed that the Certification Directorate and the Agency as a whole are on the right track towards fulfilling their obligations and providing a high level of aviation safety.

7.3 Rulemaking

The Agency's Rulemaking Directorate contributes to the production of all EU legislation and implementation material related to the regulation of civil aviation safety and environmental compatibility. It submits opinions to the European Commission and must be consulted by the Commission on any technical question in its field of competence. It is also in charge of the related international co-operation. The **Table 7-1** identifies the current rulemaking tasks with a direct impact on the identified accident and incident category.

Table 7-1 **EASA rulemaking tasks sorted by impact on accident category**

Accident Category	Rulemaking task
ARC (Abnormal runway contact)	OPS.012 (Unexpected runway changes task transferred from the JAA OPSG): TBD
	25.026 (Electronic checklist, smart alerting and automated altitude call out): 2012–2014
	25.027(Aircraft design): 2012–2014
	AWO.006 (GNSS landing system): 2013–2014
	ATM.001 (Requirements on ANSP's)
RE (Runway excursion)	OPS.012 (Unexpected runway changes task transferred from the JAA OPSG): TBD
	25.026 (Electronic checklist, smart alerting and automated altitude call out): 2012–2014
	25.027 (Aircraft design): 2012–2014
	AWO.006 (GNSS landing system): 2013–2014
	ATM.001 (Requirements on ANSP's)
	ADR.002 (Aerodrome operations)
	ADR.003 (Aerodrome design)
LATL (Low altitude operations)	OPS.054 (Helicopter radio-altimeters; review of implementing rule TBD due to implementation/ interpretation problems):
CFIT (Controlled flight into terrain)	OPS.057 (Transposition of JAA TGL-43 HEMS mountain operations): TBD
	20.003 (Required navigation performance/ area navigation): 2009
	20.006 (APV/LPV RNAV): 2010
	25.026 (Electronic checklist, smart alerting and automated altitude call out): 2012–2014
	25.027 (Aircraft design): 2012–2014
	ATM.001 (Requirements on ANSP's)
ATM/CNS (Air traffic management/ Communication navigation surveillance	20.003 (Required navigation performance/ area navigation): 2009
	20.006 (APV/LPV RNAV): 2010
	AWO.006 (GNSS landing system): 2012–2014
	ATM.001 (Requirements on ANSP's)
F-NI (Fire/smoke (non-impact))	25.006 (Thermal acoustic insulation material): closed
	MDM.002 (Electrical wiring interconnection systems): closed
	25.028 (protection form debris impact and fire): started–2013
	26.003 (Class D to class C cargo compartment): 2010–2012
	26.004 (Thermal acoustic insulation material): 2010–2013
	26.005 (Class B/ F cargo compartment): 2012–2014
	25.056(b) (Flammability reduction/ fuel tank safety): 2009

Accident Category	Rulemaking task
F-POST (Fire/ smoke (post-impact))	25.006 (Thermal acoustic insulation material): closed
EVAC (Evacuation)	25.004
	25.039 (Type and number of passenger emergency exits): 2009–2012
	26.001 (Type III exit: access and ease of operation): started–2012
	27/29.008 ((Ditching occupant survivability): 2012–2015
	ADR.002 (Aerodrome operations)
SCF-NP (System/component failure or malfunction (non-powerplant))	25.056(b) (Flammability reduction/ fuel tank safety): closed
	MDM.002 (Electrical wiring interconnection systems): closed
	25.055 (Fuel low level indication/ fuel exhaustion): 2009–2012
	25.027 (25.027 (Aircraft design): 2012–2014
	25.028 (protection form debris impact and fire): started–2013
	27/29.002 (Damage tolerance and fatigue evaluation): 2009–2011
	MDM.028 (Aging aircraft structures): started–2014
SCF-PP (System/ component failure or malfunction (powerplant))	25.055 (Fuel low level indication/ fuel exhaustion): 2009–2012
	E.009 (Ice protection): started–2012
	E.011 (Propulsion lubricating oil): 2013–2014
	E.014 (Engine core lock): 2012–2014
LOC-I (Loss of control in-flight)	23.010 (Consideration of the spin resistant in CS-23): 2014–2016
	25.028 (protection form debris impact and fire): started–2013
	27/29.003 (Yawing conditions): started–2012
	21.039 (OSC): started –2011
USOS (Undershoot/ overshoot)	25.026 (Electronic checklist, smart alerting and automated altitude call out): 2012–2014
	25.027 (Aircraft design): 2012–2014
	AWO.006 (GNSS landing system): 2013–2014
	ATM.001 (Requirements on ANSP's)
	ADR.003 (Aerodrome design)
ADRM (Aerodrome)	ADR.001 (Aerodrome operators)
	ADR.002 (Aerodrome operations)
	ADR.003 (Aerodrome design)
CABIN (Cabin safety events)	25.035 (Cabin environment-air quality-ANPA): started–2010
	26.002 (Dynamic seat testing (16g): 2009–2012
	27/29.008 ((Ditching occupant survivability): 2012–2015
FUEL (Fuel related)	25.055 (Fuel low level indication/ fuel exhaustion): 2009–2012
	ADR.002 (Aerodrome operations)
SEC (Security related)	25.057 (Security): 2009–2011
	26.006 (Re-enforced cockpit doors-double incapacitation): 2013–2016
ICE (Icing)	MDM.054 (AMC for maintenance organisations following ANPA 2007-13): 2009–2011
	25.022 Ice protection Systems: closed
	Update of ETSO C-16 for Pitot Tubes (first step: adoption of FAA TSO): closed
	25.058 Ice protection and appendix C:2010–2012
	ADR.002 (Aerodrome operations)

7.4 The European Strategic Safety Initiative (ESSI)

The European Strategic Safety Initiative (ESSI) is a voluntary, privately funded and non legally binding aviation safety partnership aiming to further enhance aviation safety in Europe and for citizens worldwide. Facilitated but not owned by EASA, it brings together aviation authorities, operators, manufacturers, associations, research laboratories, EUROCONTROL, other European stakeholders, ICAO and the FAA.

Launched in 2006 by EASA as the successor of the Joint Safety Strategy Initiative (JSSI) of the Joint Aviation Authorities (JAA), the ESSI has revitalised cooperative safety efforts in Europe. The ESSI fits naturally within the Global Aviation Safety Road Map developed in 2006 for ICAO by the Industry Safety Strategy Group led by IATA. As encouraged by the road map, ESSI provides a mechanism for coordinating safety initiatives within Europe and between Europe and the rest of the world, seeking for global alignment and non duplication of efforts. More than 150 organisations take part in the initiative.

For background information, the terms of reference, and the list of the participating organisations, please visit the ESSI website **www.easa.europa.eu/essi.**

ESSI is a member of the European Aviation Research Partnership Group (EARPG) led by EASA, where it may provide proposals for research projects and participate in project review boards. In 2009 the ESSI became a partner and a member of the editorial board of SKYbrary, the reference documentation and knowledge management centre developed by EUROCONTROL in cooperation with ICAO, Flight Safety Foundation, UK Flight Safety Committee (FSC), and the International Federation of Airworthiness (IFA).

ESSI has three safety teams:
– European Commercial Aviation Safety Team (ECAST),
– European Helicopter Safety Team (EHEST), and
– European General Aviation Safety Team (EGAST).

7.5 European Commercial Aviation Safety Team (ECAST)

ECAST is the fixed wing Commercial Air Transport (CAT) component of ESSI. Launched in October 2006, it counts more than 75 organisations and is co-chaired by IATA and EASA.

Like CAST in the US, ECAST is based on the principle that industry can complement regulatory action by voluntary commitment to costs effective safety enhancements. The partnership is sealed by a pledge by which organisations commit to be equal partners, provide reasonable resources to ensure effectiveness, and take reasonable actions as a result of recommendations, guidance and solutions developed within the initiative.
ECAST cooperates with US CAST and other major safety initiatives worldwide such as COSCAP by ICAO, EUROCONTROL Safety Initiatives, Runway Safety Initiative by Flight Safety Foundation, IATA Safety Audit programme for Ground Operations (ISAGO), and the UK Ground Handling Operations Safety Team (GHOST).

ECAST work priorities were established in 2007 on the basis of three criteria: safety importance, coverage (the extent to which the subjects are already covered in other safety initiatives and safety work), and high-level costs benefits considerations. From the combination of these criteria, the top three subjects identified were Ground Safety, Runway Safety, and Safety Management Systems (SMS).

Created in 2008, the ECAST Ground Safety Working Group developed in 2009 (non mandatory) minimum standard training concepts and syllabus for ground handling personnel, and researched the effect of human factors in ramp safety (study performed by the NLR for the

Dutch CAA). Intermediate results were presented in two main International Conferences: GHI 2009 and ACI 2009.

Runway Safety was indirectly addressed through participation in the Runway Safety Initiative led by the Flight Safety Foundation.

Concerning SMS, a Working Group was tasked in 2008 to develop (non mandatory) best practice material to help stakeholders comply with ICAO standards and future EASA rules relevant to safety management. This material was published in April 2009 on the ESSI website and on SKYbrary. With regard to risk assessment, (a central concept for SMS), ECAST promotes the methodology developed by the Airlines Risk Management Solutions (ARMS) Team.

ECAST also monitors implementation of the action plans inherited from the JSSI. These plans address the reduction of the risks of controlled flight into terrain (CFIT), approach and landing, and loss of control accidents. In addition, ECAST launched in 2009 preliminary work in view of implementing in Europe a selection of action plans developed by US CAST on subjects such as cargo, icing, maintenance and systems, wrong runway departure, and runway confusion and incursion.

In parallel, the ECAST Safety Analysis Team developed a new methodology for accident risk identification usable among other to redefine in the years to come the list of ECAST priorities. ECAST work progress was presented in two high-profile international Conferences: EASS and IASS 2009.

For further information, please refer to **www.easa.europa.eu/essi/ecastEN.html**.

7.6 European Helicopter Safety Team (EHEST)

EHEST is the helicopter component of the ESSI. Co-chaired by EASA, Eurocopter, and the European Helicopter Operators Committee (EHOC), EHEST brings together helicopter manufacturers, operators, regulators, helicopter and pilot associations, research organisations, accident investigators, representatives from the General Aviation community and a few military operators from across Europe. The EHEST counts more than 50 participating organisations, of which around 30 are involved in analysis and implementation activities.

EHEST is also the European component of the International Helicopter Safety Team (IHST), a combined government and industry effort launched in 2005 to reduce the helicopter accident rates by 80 % by 2016 worldwide.

In 2008, the European Helicopter Safety Analysis Team (the analysis team of EHEST), has performed an analysis of 186 accidents where a final investigation report from the Accident Investigation Board has been issued. This represents some 58 % of the entire set for this timeframe. To tackle the variety of languages used in accident reports and optimise resource use, EHSAT has established nine regional analysis teams across Europe. Regional analyses were then consolidated at European level. This initiative is unique in its efforts to conduct a European wide analysis of helicopter accidents.

EHEST published in April 2009 a preliminary analysis report presenting the main results of this analysis. Intermediate results based on 303 accidents were presented in IHSS 2009 in Montreal in October and in the 3rd EASA Rotorcraft Symposium in Cologne in December.

The top three areas identified from the analysis are 'Pilot judgement and actions', 'Safety Management and Safety Culture', and 'Pilot situation awareness'. Different patterns and accident scenarios were observed for Commercial Air Transport, Aerial Work and General Aviation.

To address these high priority topics, three Specialist Teams were set up under the European Helicopter Safety Implementation Team (the implementation team of EHEST) on Operations and SMS, Training, and Regulatory matters. Deliverables are due in 2010-2012 and plans will be presented at IHSS 2010 in October in Cascais, Portugal. Cooperation within the International Helicopter Safety Team (IHST) was reinforced both at executive and technical levels.

For further information, please refer to **www.easa.europa.eu/essi/ehestEN.html** and to **www.ihst.org.**

7.7 European General Aviation Safety Team (EGAST)

EGAST is the third component of the ESSI. The foundation meeting took place at EASA in October 2007 and was attended by over 60 representatives of the general aviation (GA) community from across Europe.

EGAST responds to the need for a coordinated effort to improve GA safety in Europe. Building on existing initiatives at national level or within GA organisations, it is co-chaired by EASA, the European Business Aviation Association (EBAA), the European Airshow Council (EAC) and the European Council for General Aviation Support (ECOGAS).

EGAST is composed of representatives of associations, manufacturers, regulators, aero-clubs, accident investigators, research organisations, and other GA stakeholders. It is organised in three layers representing different levels of involvement: EGAST Level 1 is the core team that runs the initiative. It is composed of around 20 organisations reflecting the different GA sectors. Level 2 is composed of around 60 organisations involved in the initiative without running it, and EGAST Level 3 is the global European GA community.

ECAST got organised around three main activities: Safety Promotion, Data Collection and Analysis, and Prospective Safety.

In 2009, EGAST has published safety promotion leaflets and videos on Loss of Control and Collision Avoidance in cooperation with UK CAA and the Institut pour l'Amélioration de la Sécurité Aérienne (IASA), France, and contacts were established with the FAA Safety Team (FAAST) in the US.

Preliminary work was performed on aggregation of fleet and exposure data, which are necessary to calculate accident rates at European level. Working Group was launched on Proactive Safety. In 2009, this WG has developed a method to identify emerging and future risks to GA. based on the Future Aviation Safety Team (FAST) methodology documented on SKYbrary. The method will be applied in 2010 to produce safety leaflets on selected topics.

Beside these three core activities, EGAST has also an interest on research. In 2009, it has cooperated with the European Aviation Research Partnership Group (EARPG) on two EASA funded research projects on 'Safety Spin Resistance Concept' and 'Safety Implications of Biofuels in GA'.

For further information, please refer to the EGAST website: **www.easa.europa.eu/essi/egastEN.html**.

Appendix 1: General remarks on data collection and quality

The data presented is not complete. For light aircraft, information from some Member States is missing. Without prompt availability of investigation results and without complete or timely provision of data by States, the Agency cannot present a complete picture of all aspects of the safety of civil aviation in Europe.

The Agency will continue to make efforts to obtain light aircraft accident data for future annual safety reviews and expects better data coverage as the reporting systems and awareness of lack of data matures in EASA MS.

Work with the data shows that the CICTT accident categories have limited usefulness when applied to helicopters, light aircraft and other aviation activities such as hang-gliding or parachuting. To this end, new approaches have been developed to better trace the safety concerns in this segment of the aviation system. Related changes already made by to the CICTT accident category taxonomy could not be applied in this year's accidents as the authorities will begin using the new classification scheme from 2010 and onwards.

For larger aircraft, the data is as complete as States have reported accident data to ICAO in accordance with Annex 13. Checks have revealed that not all States report in full and in time to ICAO.

Appendix 2: Definitions and acronyms

A2-1: General

AD	Airworthiness directive: a notification to aircraft owners and operators of a known safety issues with a particular model of aircraft, engine, avionics or other system.
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.
ATM	Air Traffic Management
COMMERCIAL AIR TRANSPORT (CAT)	An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.
CAST	Commercial Aviation Safety Team. ECAST is the European initiative.
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.
ECAST	European Commercial Aviation Safety Team
ECR	European Central Repository for occurrences
EGAST	European General Aviation Safety Team
EHEST	European Helicopter Safety Team
EMS	Emergency Medical Service
ESSI	European Strategic Safety Initiative
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)
GENERAL AVIATION (GA)	An aircraft operation other than a commercial air transport operation or an aerial work operation.
ICAO	International Civil Aviation Organisation
IHST	International Helicopter Safety team
LIGHT AIRCRAFT	Aircraft with a maximum certificated take-off mass below 2 251 kg.
MTOM	Maximum certificated take-off mass
SAFA	Safety assessment of foreign aircraft
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.
SMS	Safety Management System
THIRD COUNTRY OPERATED AIRCRAFT	An aircraft which is not used or operated under control of a competent authority of an EU Member State.

Appendix 2: Definitions and acronyms

A2-2: Accident categories acronyms

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 events
CFIT	Controlled flight into or toward terrain
EVAC	Evacuation
F-NI	Fire / smoke (non-impact)
F-POST	Fire / smoke (post-impact)
FUEL	Fuel related
GCOL	Ground collision
RAMP	Ground handling
ICE	Icing
LOC-G	Loss of control — Ground
LOC-I	Loss of control — In-flight
LALT	Low altitude operations
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
USOS	Undershoot / overshoot
UNK	Unknown or undetermined
WSTRW	Windshear or thunderstorm

Accident categories can be used to classify occurrence 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 see the website **(http://intlaviationstandards.org/index.html)**.

Appendix 3: List of figures and tables

A3-1: List of figures

Appendix 3: List of figures and tables

A3-2: List of tables

Appendix 4: Listing of fatal accidents (2009)

The following tables contain a listing of fatal accidents in 2009 with commercial air transport operations with aeroplanes over 2 250 kg maximum certificated take-off mass.

Aircraft operated by EASA MS operators

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities	Accident categories
01/06/2009	South Atlantic Ocean	A330-200	Passenger	228		UNK : Unknown or undetermined

Note: [6] The occurrence category 'Unknown' has been assigned to those accidents where there is either insufficient information available to categorize the accident or where, in the eyes of the Safety Indicator Study Group, additional information resulting from the investigation is likely to suggest that additional accident categories may have to be assigned.

Aircraft operated by third country operators

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities	Accident categories
07/02/2009	Brazil	110 BANDEIRANTE	Passenger	24		SCF-PP: Powerplant failure or malfunction
12/02/2009	United States	DHC8	Passenger	49	1	F-POST: Fire/smoke (post-impact)
						LOC-I: Loss of control in-flight
20/02/2009	Egypt	AN-12	Ferry/positioning	5		F-NI: Fire/smoke (non-impact)
						FUEL: Fuel related
						UNK: Unknown or undetermined
25/02/2009	The Netherlands	737-800	Passenger	9		LOC-I: Loss of control in-flight
						SCF-NP: System/component failure or malfunction (non-powerplant)
						UNK: Unknown or undetermined

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities	Accident categories
09/03/2009	Uganda	IL-76	Cargo	11		UNK: Unknown or undetermined
22/03/2009	United States	PC-12	Passenger	14		UNK: Unknown or undetermined
23/03/2009	Japan	MD-11	Cargo	2		ARC: Abnormal runway contact
						F-POST: Fire/smoke (post-impact)
						RE: Runway excursion
						WSTRW: Windshear or thunderstorm.
02/04/2009	Philippines	BN-2A ISLANDER	Passenger	7		UNK: Unknown or undetermined
09/04/2009	Indonesia	146-300	Cargo	6		CFIT: Controlled flight into or toward terrain
17/04/2009	Indonesia	PC-6B TURBO-PORTER	Passenger	11		UNK: Unknown or undetermined
17/04/2009	Venezuela	208 CARAVAN I	Passenger	1		SCF-PP: Powerplant failure or malfunction
25/04/2009	United States	HARPOON/PV-2	Ferry/positioning	3		CFIT: Controlled flight into or toward terrain
29/04/2009	Congo, the Democratic Republic of	737-200	Ferry/positioning	7		UNK: Unknown or undetermined
30/04/2009	Russian Federation	AN-2	Cargo	3		CFIT: Controlled flight into or toward terrain
26/05/2009	Congo, the Democratic Republic of	AN-26/AN-26B	Cargo	3		CFIT: Controlled flight into or toward terrain
07/06/2009	Canada	BN-2A ISLANDER	Emergency Medical Service	1		UNK: Unknown or undetermined
29/06/2009	Indonesia	DHC6 TWIN OTTER	Passenger	3		CFIT: Controlled flight into or toward terrain
						UNK: Unknown or undetermined
30/06/2009	Comoros	A310	Passenger	152		UNK: Unknown or undetermined
09/07/2009	Canada	PA-31P-350 (MOJAVE)	Cargo	2		UNK: Unknown or undetermined
15/07/2009	Iran, Islamic Republic of	TU-154M/TU-164	Passenger	168		F-NI: Fire/smoke (non-impact)
						UNK: Unknown or undetermined
24/07/2009	Iran, Islamic Republic of	IL-62M/IL-62K	Passenger	16		ARC: Abnormal runway contact
						RE: Runway excursion
						UNK: Unknown or undetermined
02/08/2009	Indonesia	DHC6-300	Passenger	16		CFIT: Controlled flight into or toward terrain
						UNK: Unknown or undetermined

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities	Accident categories
04/08/2009	Thailand	ATR 72-200	Passenger	1		RE: Runway excursion
						ADRM: Aerodrome
						UNK: Unknown or undetermined
11/08/2009	Papua New Guinea	DHC6 TWIN OTTER	Passenger	13		UNK: Unknown or undetermined
26/08/2009	Congo, the Democratic Republic of	AN-12	Cargo	6		UNK: Unknown or undetermined
24/09/2009	South Africa	BAE-4100 JETSREAM 41	Ferry/positioning	1		SCF-PP: Powerplant failure or malfunction
17/10/2009	Philippines	DC-3 DAKOTA/C-47	Cargo	4		SCF-PP: Powerplant failure or malfunction
21/10/2009	United Arab Emirates	707-300	Cargo	6		SCF-NP: System/component failure or malfunction (non-powerplant)
						UNK: Unknown or undetermined
22/10/2009	Netherlands, Antilles	BN-2A ISLANDER	Passenger	1		SCF-PP: Powerplant failure or malfunction
06/11/2009	Canada	310	Air taxi	3		UNK: Unknown or undetermined
09/11/2009	Kenya	1900	Cargo	2		UNK: Unknown or undetermined
12/11/2009	Rwanda	REGIONAL JET SERIES 100/200	Passenger	1		GCOL: Ground Collision
						SCF-PP: Powerplant failure or malfunction
15/11/2009	Namibia	208 CARAVAN I	Passenger	3		RAMP: Ground Handling
						LOC-I: Loss of control in-flight
28/11/2009	China	MD-11	Cargo	3		ARC: Abnormal runway contact
						F-POST: Fire/smoke (post-impact)
						RE: Runway excursion
29/11/2009	Canada	DHC2 MK I BEAVER	Air taxi	6		UNK: Unknown or undetermined
09/12/2009	Canada	100 KING AIR	Passenger	2		UNK: Unknown or undetermined
19/12/2009	Sudan	748	Passenger		1	RE: Runway excursion
						ADRM: Aerodrome

Disclaimer

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

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