European Aviation Safety Agency

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ANNUAL SAFETY REVIEW 2007

EUROPEAN AVIATION SAFETY AGENCY

ANNUAL SAFETY REVIEW 2007

CONTENT

EXECUTIVE SUMMARY

2007 was a good year for civil aviation safety in Europe. The number of fatal accidents in commercial air transport dropped from six in 2006 to three in 2007 and is one of the lowest in the decade. In 2007, only five per cent of all accidents in commercial air transport worldwide occurred with aeroplanes registered in 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. Numbers of fatal accidents in helicopter commercial air transport operations in Europe also decreased from four in 2006 to one in 2007.

The number of fatal accidents for aerial work and general aviation 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 second time, the Agency collected accident data for light aircraft (mass below 2 250 kg) from EASA MS. Overall, the number of accidents in this category of aircraft was below 2006 figures. However, the Agency sees a need to further improve harmonisation of data collection and data sharing among the States.

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.

Since 1 January 2007, EASA is responsible for the management and further development of the Safety Assessment of Foreign Aircraft (SAFA) database. Thus, the database was successfully transferred from the Joint Aviation Authorities (JAA) to the Agency and regular analyses are performed.

The European Strategic Safety Initiative (ESSI) saw considerable progress in 2007. While work in the two already founded subgroups, European Commercial Aviation Safety Team (ECAST), European Helicopter Safety Team (EHEST) was consolidated, the third pillar of the initiative was launched. The foundation meeting of the European General Aviation Safety Team (EGAST) took place in October 2007 with more than 60 participants. The aim of this team is to promote safety, improve data collection and analysis, as well as sharing best practices among the dispersed general aviation community.

1.0 INTRODUCTION

1.1 Background

Air transport is one of the safest forms of travel. As air traffic continues to grow, a common initiative is needed at the European level to keep air transport safe and sustainable. 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 a European level. Also, it monitors the implementation of standards through inspections in the Member States and provides technical expertise, training and research. The Agency works together with the national authorities who continue to carry out operational tasks such as the issuing of Certificates of Airworthiness for individual aircraft and the licensing of pilots.

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 and 2007. Furthermore, data on the operation of aircraft for commercial air transport was obtained from both ICAO and the NLR Air Transport Safety Institute.

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 Registry of the accident aircraft.

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.

This *Annual safety review* has, compared with the previous reports of 2006 and 2005, more data on aeroplane accident rates, helicopters and light aircraft accidents in Europe. As data sources are improved the content of future annual safety reviews will be enhanced.

1.3 Content of the report

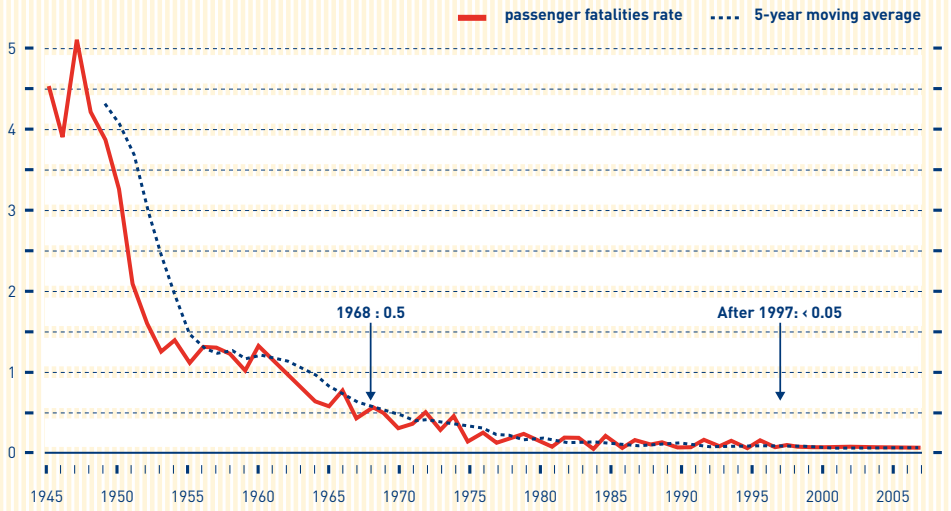
Chapter 2 presents an overview of the historical development of aviation safety. Statistics are provided on commercial air transport operations in Chapter 3. Chapter 4 provides data on general aviation and aerial work. Chapter 5 covers accidents of light aircraft in EASA MS.

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 2007 are based on preliminary estimates.

FIGURE 1 Global passenger fatalities per 100 million passenger miles, scheduled commercial transport operations, excluding acts of unlawful interference

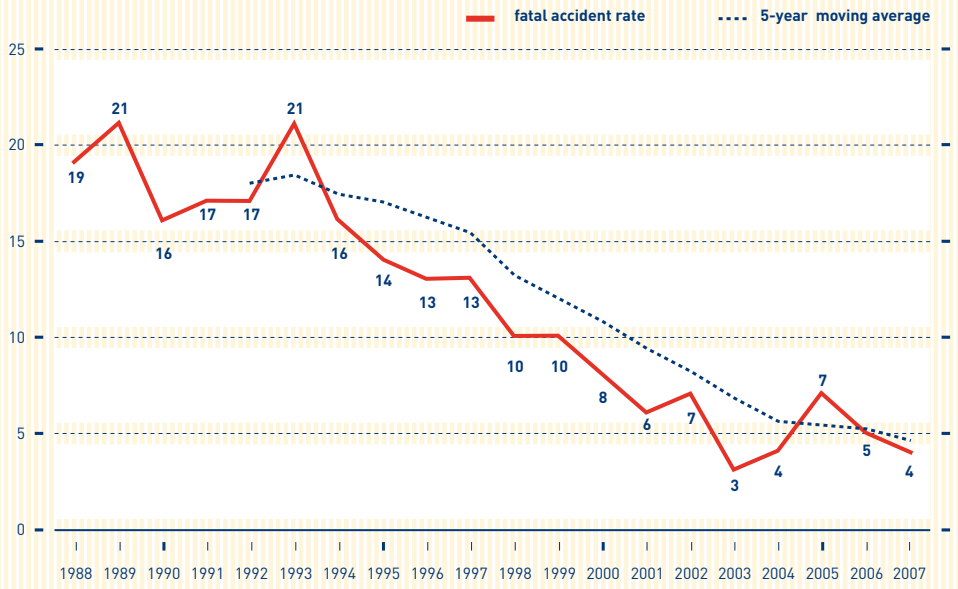


The data in Figure 1 show that the safety of aviation has improved from 1945 onwards. Based on the measure of passenger fatalities per 100 million miles flown, it took some 20 years (1948 to 1968) to achieve the first 10-fold improvement from 5 to 0.5. Another 10-fold improvement was reached in 1997, some 30 years later, when the rate had dropped below 0.05. For the year 2007 this rate is estimated to have dropped to 0.014 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.

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.

FIGURE 2 Global rate of accidents involving passenger fatalities per 10 million flights, scheduled commercial transport operations, excluding acts of unlawful interference



The rate of accidents involving passenger fatalities in scheduled operations (excluding acts of unlawful interference) per 10 million flights ranged from 19 (1988) to 21 (1993) and showed no improvement from 1987 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. It should be noted that the accident rate for scheduled operations differs significantly per world region (Figure 3).

FIGURE 3 Rate of fatal accidents per 10 million flights per world region (2000–2007, scheduled passenger and cargo operations)

Figure 3 shows the average rate of fatal accidents per 10 million flights from 2000 until 2007, per world region. 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, AIRCRAFT OVER 2 250 KG MTOM

This chapter reviews the aviation accident data for commercial air transport operations. These operations involve the transportation of passengers, cargo or mail for remuneration or hire. The accidents concerned involved at least one fatal injury and an aircraft with a maximum certificated take-off mass (MTOM) exceeding 2 250 kg during the period 1998–2007. These aircraft may be aeroplanes or helicopters. Aircraft accidents were aggregated based on the State of Registry. The use of the aircraft's registration mark to determine the geographic dispersal of accidents has certain characteristics. For example, accidents involving EASA MS registered aircraft were included, although the aircraft were operated by organisations outside the jurisdiction of those States.

3.1 Aeroplanes

Several measurements can be used to assess the safety level. The number of accidents involving at least one fatal injury can be one such measurement. Aircraft accidents involving a fatality are random events and for this reason one year may exhibit a significantly different number of accidents from the previous year.

TABLE 1 Overview of total number of accidents and fatal accidents for EASA MS registered aircraft.

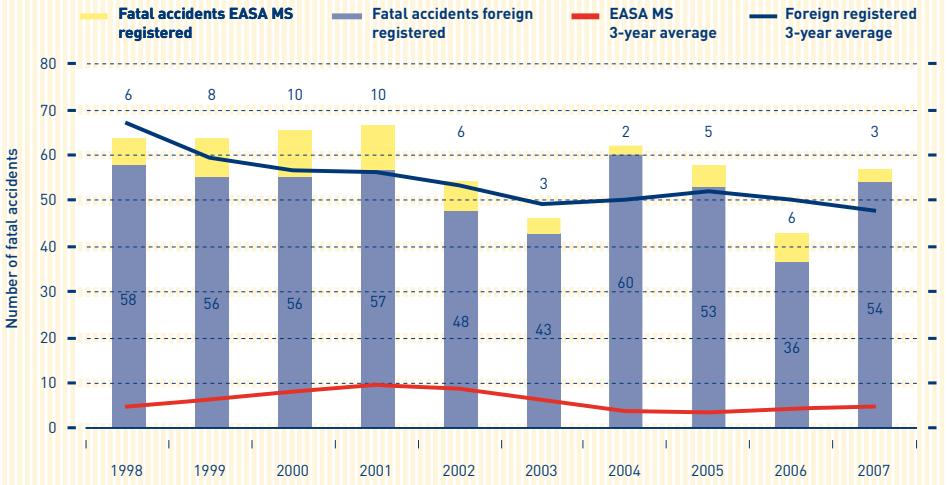
Period	Number of accidents	Of which, fatal accidents	Fatalities on board	Ground fatalities
1996–2005 (average)	31	6	79	1
2006 (total)	39	6	146	0
2007 (total)	34	3	25	1

3.1.1 Fatal accidents

Figure 4 presents the number of accidents for EASA MS and for foreign (non-EASA MS) registered aeroplanes. Regarding foreign registered aeroplanes, the number of fatal accidents has increased from 36 in the year 2006 to 54 accidents in 2007. The number of accidents in 2007 is higher than the decade (1998-2007) average (52) but not one of the highest in the decade. The trend for the decade indicates that the number of accidents worldwide is declining.

The number of fatal accidents involving aircraft registered in EASA MS has decreased from six in 2006 to three in 2007. The number of accidents in 2007 is one of the lowest in the decade, well below the average of six fatal accidents per year. The number of accidents involving aircraft registered in the EASA MS represents 5 % of the total number of accidents worldwide that occurred in 2007.

FIGURE 4 Fatal accidents — EASA MS and foreign registered



3.1.2 Fatal accident rates

In order to derive meaningful conclusions from the absolute accident numbers presented above, the number of fatal accidents in scheduled air transport operations was combined with the number of flights conducted by such operations. These rates allow the comparison of safety trends, by taking into account changes in the level of traffic.

FIGURE 5 Rate of fatal accidents in scheduled passenger operations — EASA MS and foreign registered

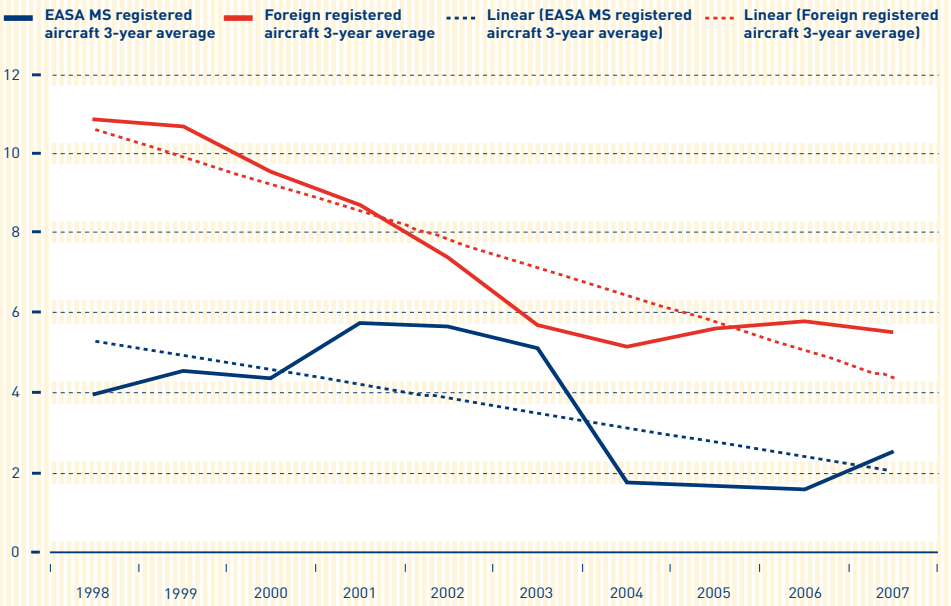


Figure 5 provides the fatal accident rate per 10 million scheduled passenger flights averaged over three-year periods.

The safety record for aircraft registered in EASA MS and conducting scheduled passenger operations is significantly better than that for the rest of the world. During the past decade the rate of accidents decreased from an average of four to three accidents per 10 million flights for EASA MS.

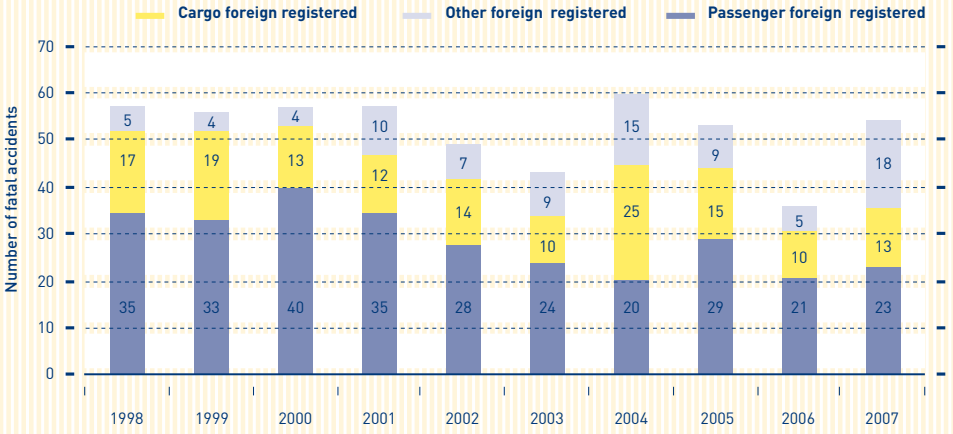
In Figure 5, it is observed that during 2001 the rate of fatal accidents increased significantly above the decade average. During that single year, six accidents — involving scheduled passenger operations — occurred which represent more than a quarter of all accidents in the decade. These accidents were a Britten-Norman Islander with eight fatalities, a De Havilland DHC-6-300 with 20 fatalities, an Avro RJ100 with 24 fatalities, an Antonov An-28 with two fatalities, a CASA CN-235 with four fatalities and a Boeing 777-200 with one fatality. The last accident involved a fatality on the ground during refuelling.

The number of fatal accidents may not necessarily give a comprehensive overview of the safety levels. This is because an accident with a single fatality has the same weight as an accident involving many more fatalities.

3.1.3 Fatal accidents per type of operation

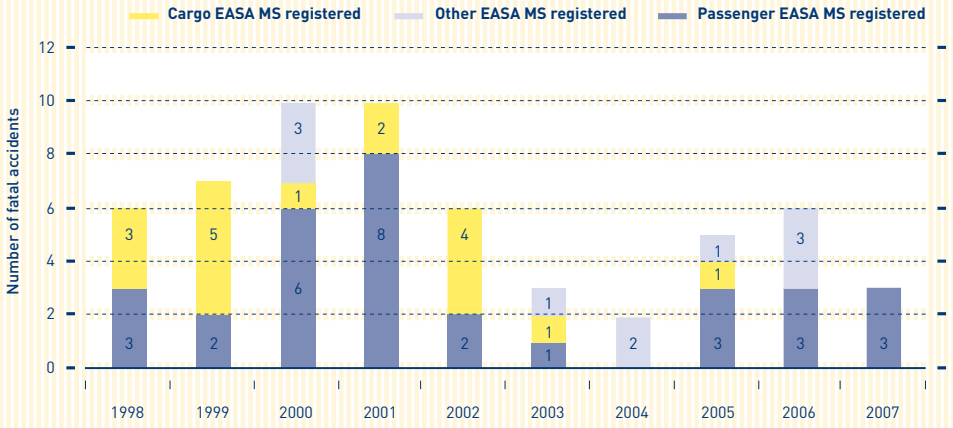
The number of fatal accidents differs per type of operation. As shown in Figure 6, worldwide (excluding EASA MS), passenger commercial air transport flights appear to have a declining proportion in the total number of fatal accidents. Other commercial air transport operations, such as air taxi or ferry flights, have an increasing proportion of the total (category: other). Almost a third of all accidents appear to 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 aircraft and the type of operations they are used for is not provided in this safety review.

FIGURE 6 Fatal accidents by type of operation — Foreign aeroplanes



For EASA MS the accidents per type of operation appear to be different, as shown in Figure 7. The small number of accidents makes the type of operation during which an accident occurred an almost random characteristic. However, despite the steadily decreasing number of accidents, there is a constant occurrence of accidents involving passenger air transport operations.

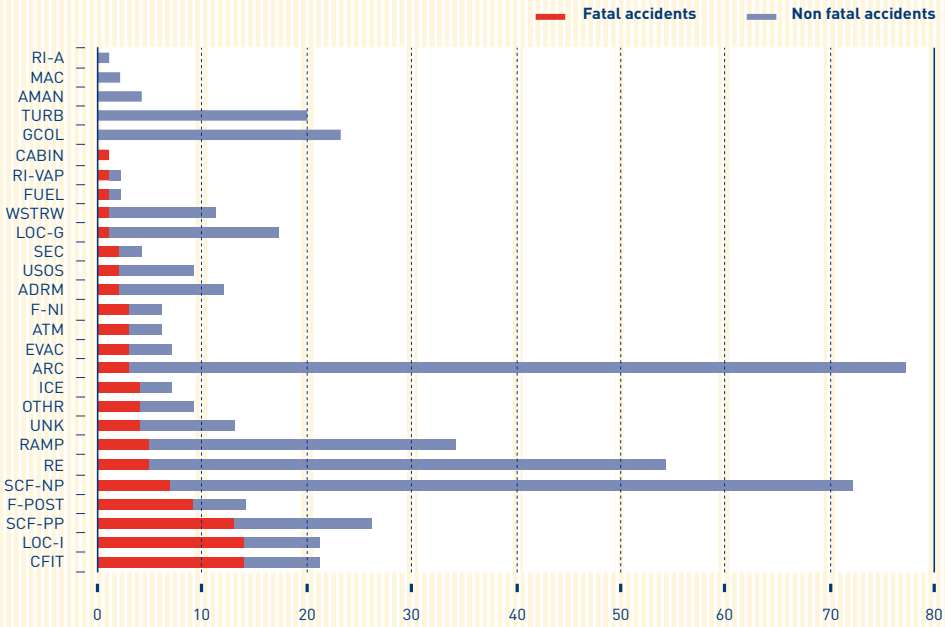
FIGURE 7 Fatal accidents by type of operation — EASA MS



3.1.4 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 registered aircraft which occurred during commercial air transport operations were assigned under relevant accident categories. These categories are based on the work ([1]) done by the CICTT.

FIGURE 8 Accident categories — EASA MS



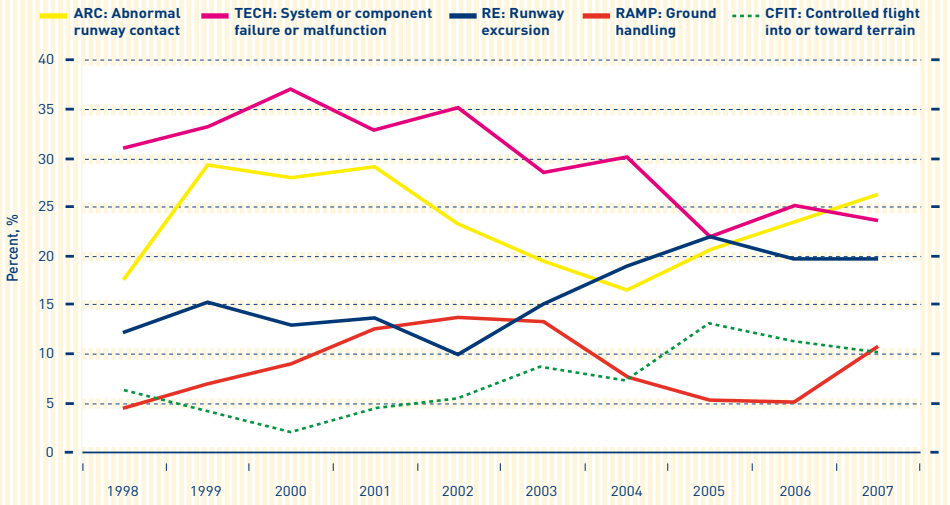
As shown in amongst the accident categories with high number of fatal accidents are CFIT (controlled flight into terrain), LOC-I (loss of control — in-flight) and SCF-PP (system or component failure or malfunction related to the engine/power-plant).

CFIT involves a collision with terrain or obstacles without any preceding loss of control. Adverse weather conditions or limited visibility were prevalent during most accidents assigned the CFIT category. 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.

[1] The CICTT developed a common taxonomy for accident and incident reporting systems. Further information may be found in Appendix 2: Definitions and acronyms.

SCF-PP refers to accidents during which a system or component related to the aircraft engines failed or malfunctioned. In order to further analyse accident category trends over the most recent years SCF-PP and SCF-NP (non-powerplant) were combined into one category related to technical problems (TECH).

FIGURE 9 Percentage of accidents assigned the top four categories and CFIT category



NB: An accident may be assigned multiple categories (the sum may be greater than 100 %).

An accident may be assigned more than one category depending on the number of factors contributing to the accident. The categories with the highest percentage of accidents assigned are RE (runway excursion), TECH, ARC (abnormal runway contact) and RAMP. Accidents are assigned under the runway excursion category if during the accident the aircraft veered off the runway surface. In many cases runway excursions are consequential events in accidents and therefore a large number of accidents are assigned this category.

ARC involves an abnormal contact of the aircraft's fuselage or wings with the runway. This abnormal contact may occur during landing or take-off and may be the result of, among others, the landing gear failing to deploy properly. Although accidents categorised under CFIT overall have a declining trend they are presented in this review due to related safety actions taken in recent decades.

3.2 Helicopters

The following section provides an overview of accidents in commercial air transport operations with helicopters (MTOM over 2 250 kg). No comprehensive operation data (e.g. flying hours) is generally available for helicopters.

In general, helicopter operations differ from aeroplane operations. Helicopters often take-off or land in areas other than airports, such as helipads, private landing sites and unprepared landing sites. Also, a helicopter has different aerodynamic and handling characteristics from aeroplanes. All this is reflected in the different accident characteristics.

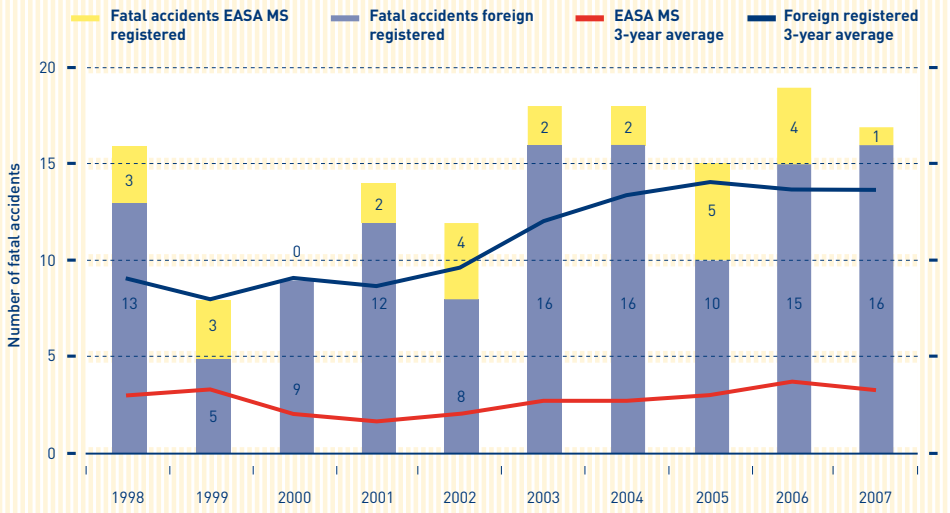
TABLE 2 Overview of total number of accidents and fatal accidents for EASA MS registered helicopters only.

Period	Number of accidents	Of which, fatal accidents	Fatalities on board	Ground fatalities
1996–2005 (average)	7	3	11	0
2006 (total)	15	4	13	0
2007 (total)	7	1	7	0

3.2.1 Fatal accidents

The data shows that between 1998 and 2007 there have been 26 fatal accidents involving an EASA MS registered helicopter compared with 120 fatal accidents involving foreign registered aircraft. As a proportion, EASA MS accidents represent 18 % of the total. The number of accidents varies over the decade. When looking at the three-year moving average, it appears that the number of fatal accidents has increased in the second half of the decade.

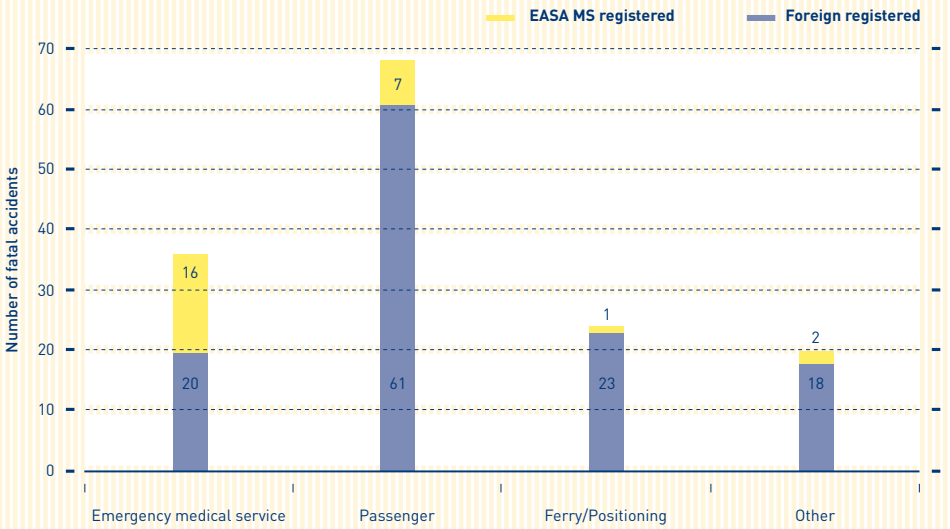
FIGURE 10 Number of fatal accidents — EASA MS and foreign registered helicopters



3.2.2 Fatal accidents per type of operation

Figure 11 presents the type of operation involved in fatal accidents. When reviewing the type of operation involved in fatal accidents, a difference can be observed between the EASA MS registered aircraft and foreign registered aircraft.

FIGURE 11 Fatal accidents per type of operation — EASA MS and foreign registered helicopters



When looking at foreign registered aircraft, passenger transport is the main type of operation involved in fatal accidents. Most fatal accidents (16) of EASA MS aircraft involved helicopters operating as emergency medical services (EMS). This represents 44 % of the total number of fatal accidents involving EMS operations worldwide. These EMS flights facilitate emergency medical assistance, where immediate and rapid transportation of medical personnel, medical supplies or injured persons is essential.

The "other" operations category includes operations such as cargo, commercial training flights or operations the type of which is unknown.

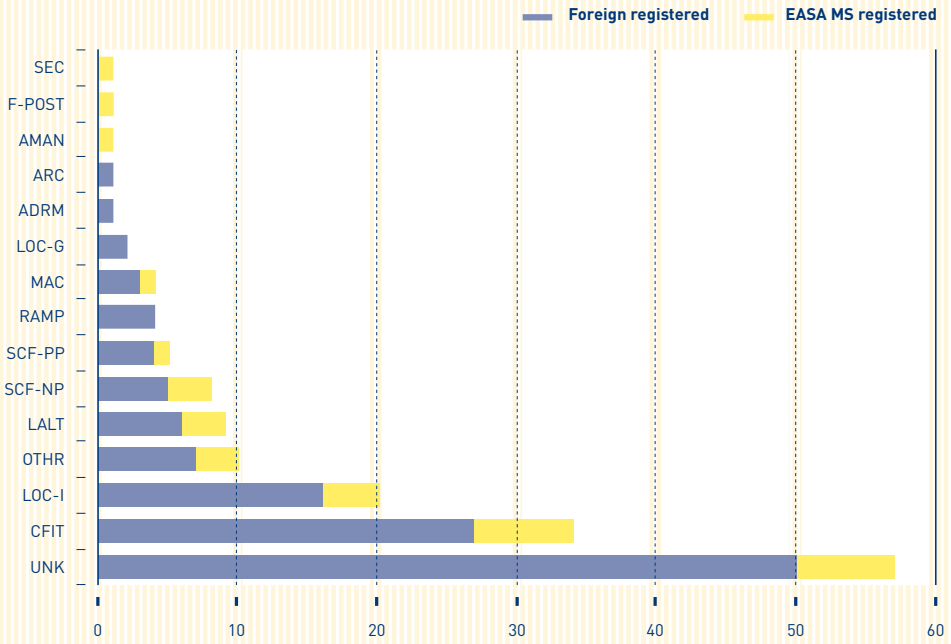
It is worth noting that in the last decade, worldwide 25 helicopters involved in fatal accidents were performing an offshore flight: flights to or from an offshore installation. These accidents are included in all four of the categories mentioned above.

3.2.3 Accident categories

The CICTT accident categories were originally developed for accidents involving large commercial aeroplanes. For this *Annual safety review*, those accident categories have also been assigned to the fatal helicopter accidents. More than one category can be assigned to an accident.

As shown in Figure 12, the majority of helicopter accidents are assigned under the category of "unknown". This is because in some cases it is not possible to determine the accident cause.

FIGURE 12 Accident categories of fatal accidents — Helicopters, EASA MS and foreign registered



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

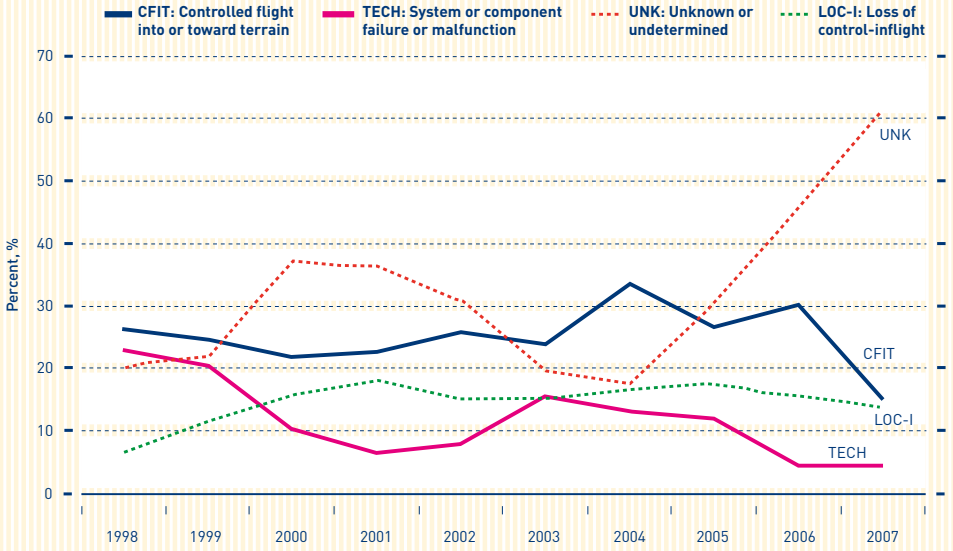
Loss of control in flight (LOC-I) has the third highest number of accidents assigned. Helicopter handling difficulties together with the presence of adverse weather conditions were mentioned in several accidents. The "other" (OTHR) category mainly has been assigned to accidents during take-off and landing phases where a collision with objects on the ground occurred.

Low altitude (LALT) accidents are collisions with terrain and obstacles that occurred while intentionally operating near the surface, excluding take-off and landing phases. It is important to note that a significant number of LALT and OTHR involved a collision with power lines.

SCF-NP and SCF-PP can be grouped together as the more technical systems related accidents or TECH category. The accidents in this category mainly involve critical systems: engine failures, main rotor system failures or tail rotor system failures.

Figure 13 presents the trend of the top six categories over the decade (three-year moving averages). The sharp rise for the "unknown" category for the years 2005–2007 is probably due to uncompleted accident investigations. When more investigation results become available the trend for the latest years is expected to change.

FIGURE 13 Proportion of top four accident categories — Fatal accidents — Helicopter commercial transport operations



4.0 GENERAL AVIATION AND AERIAL WORK, AIRCRAFT OVER 2 250 KG MTOM

This chapter provides data on accidents to aircraft involved in general aviation and aerial work. The information provided in this chapter is based on data obtained from ICAO.

In ICAO documents, the term "aerial work" is defined as 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.

ICAO defines as "general aviation" all civil aviation operations other than scheduled or non-scheduled air transport operations for remuneration or hire or aerial work.

For the decade 1998–2007, the distribution of fatal accidents by type of operation is as shown below.

FIGURE 14 Aeroplanes over 2 250 kg — Fatal accidents — EASA MS

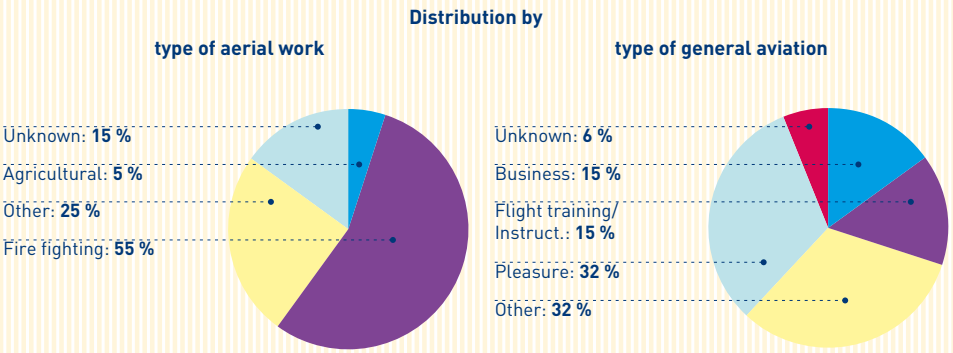


FIGURE 15 Helicopters over 2 250 kg — Fatal accidents — EASA MS

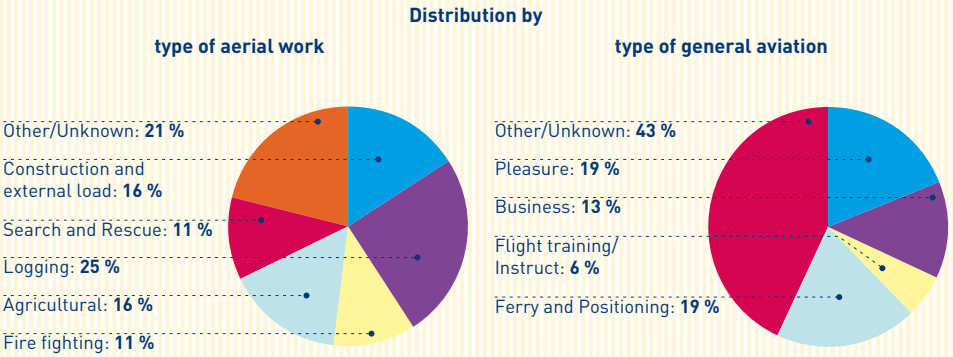


TABLE 3 Aircraft over 2 250 kg — Number of accidents, fatal accidents and fatalities by type of aircraft and type of operation — Aircraft registered in EASA MS only

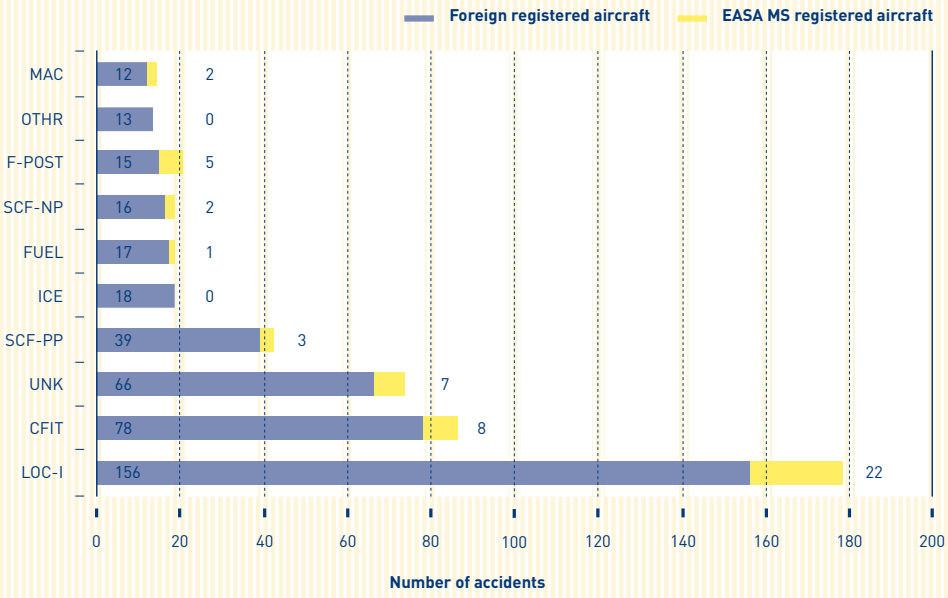
Aircraft type	Operations type	Period	Number of accidents	Of which, fatal accidents	Fatalities on board	Ground fatalities
Aeroplane	Aerial work	1996–2005 (average)	5	2	4	0
		2006 (total)	2	0	0	0
		2007 (total)	4	3	4	0
Aeroplane	General aviation	1996–2005 (average)	15	5	17	< 1
		2006 (total)	19	7	16	0
		2007 (total)	13	4	5	0
Helicopter	Aerial work	1996–2005 (average)	6	2	3	< 1
		2006 (total)	7	1	6	0
		2007 (total)	8	1	0	1
Helicopter	General aviation	1996–2005 (average)	4	1	2	0
		2006 (total)	8	2	7	0
		2007 (total)	4	3	10	0

Table 3 provides an overview of the number of accidents and fatal injuries since 1996. The number of accidents in aerial work operations is similar for aeroplanes and helicopters for the decade 1996–2005. In recent years the number of helicopter accidents in this type of operation is more than double than that for aeroplanes. In general aviation the small number of accidents involving helicopters in comparison to aeroplanes is probably a reflection of the relatively lower number of helicopters used in this type of operation.

4.1 Accident categories — General aviation — Aeroplanes

It was observed that several accidents obtained from ICAO had not been classified in terms of the accident categories. Consequently, the numbers presented provide a low estimate of the frequency for all accident categories.

FIGURE 16 General aviation — Aeroplanes over 2 250 kg — Fatal accidents, EASA MS and foreign registered aircraft



For general aviation aircraft worldwide and within the EASA MS, LOC-I (loss of control in flight) is the leading accident category. The number of CFIT (controlled flight into or towards terrain) occurrences worldwide is about half of that of loss of control in flight, while for EASA MS it is about one third. Technical issues appear to play a much smaller role.

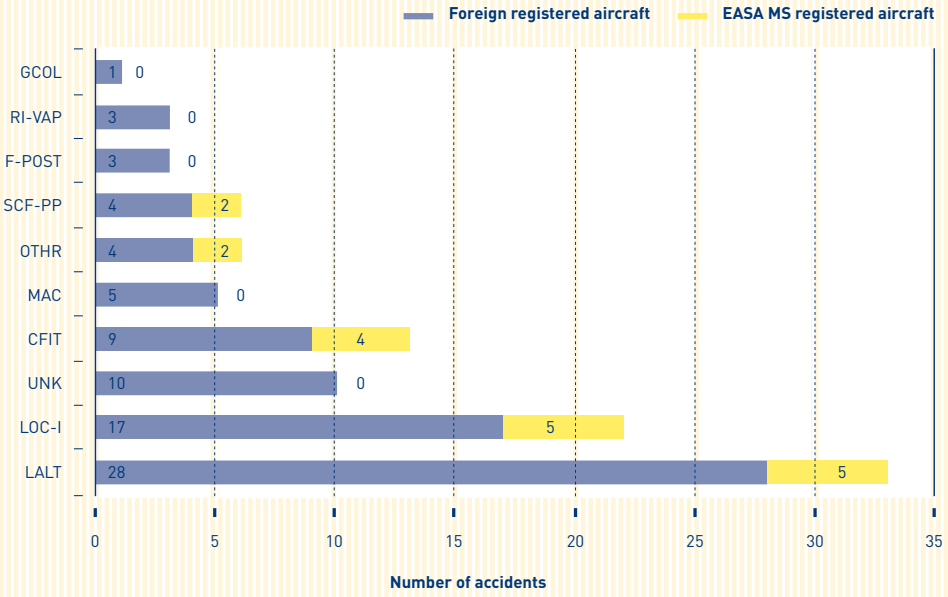
In general, the experience for general aviation is similar to that of commercial air transport operations in that CFIT and loss of control in flight are the leading categories for fatal accidents.

4.2 Accident categories — Aerial work — Aeroplanes

As mentioned above, aerial work involves specialised operations such as fire fighting, agricultural operations and aerial observation.

There is a particular problem in obtaining data related to accidents in aerial work. One of the most hazardous types of operation in this regard is related to fire fighting. However, in some States, this activity is carried out by State organisations (e.g. the Air Force) and consequently the related activities are not classified as aerial work but as "State flights" and consequently related accidents were not included in this review.

FIGURE 17 Aerial work — Aeroplanes over 2 250 kg — Fatal accident categories

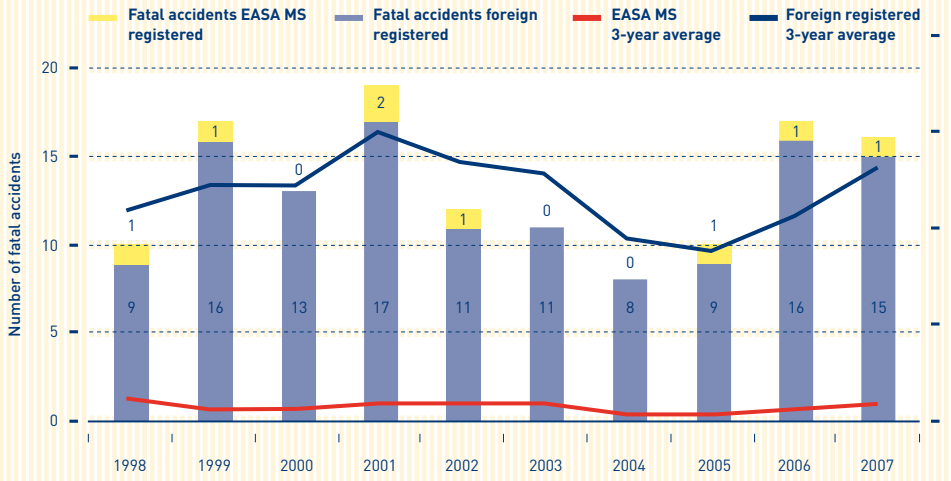


The high number fatal accidents related to low altitude operations (LALT) is no surprise as the nature of aerial work frequently involves operations close to the ground, e.g. agricultural operations. Operating at low altitudes makes recovery from a loss of control or an unforeseen event more difficult. The high number of accidents assigned the category "unknown" is testimony that the investigation and reporting of such accidents can be improved.

4.3 Business aviation — Aeroplanes

Under the ICAO definitions, business aviation is a subset of general aviation. Data on business aviation are presented separately in light of the importance of this sector.

FIGURE 18 Business aviation fatal accidents, EASA MS and foreign registered



The number of fatal accidents in business aviation for aircraft registered in EASA MS is low. Nevertheless, it would appear that worldwide the number of fatal accidents has been increasing in recent years.

5.0 LIGHT AIRCRAFT, AIRCRAFT BELOW 2 250 KG MTOM

Data on light aircraft accidents was requested from EASA MS in January 2008. By the middle of April 2008, most States had supplied the information. Data were missing from the Czech Republic, Ireland, Austria and Romania.

Reporting by States is uneven. Some provided data for accidents to parachutists, para-motors and hang-gliders, others did not. Some used a mass limit of 454 kg (1 000 pounds) to delineate "microlight" aircraft from "normal" aeroplanes, others did not. Data from some States showed that for the same aircraft manufacturer and model, two different classifications for the aircraft category were used. It would appear that more work is required to harmonise these definitions.

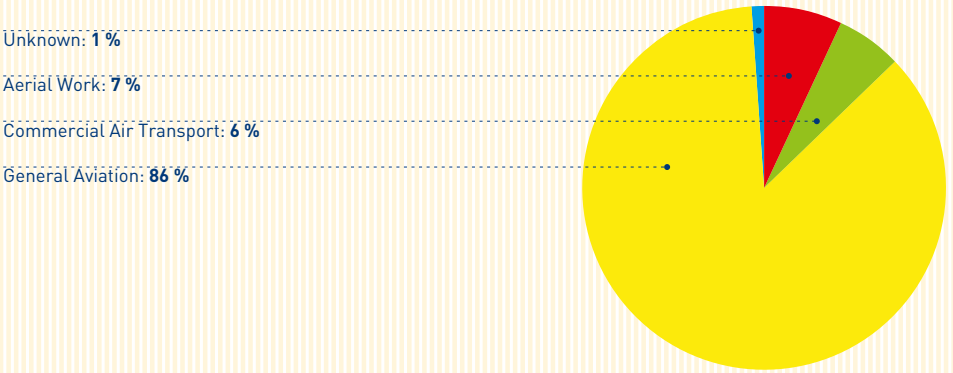
Table 4 provides the number of accidents and their related fatalities for the years 2006 and 2007 based on the data reported.

TABLE 4 Accidents, fatal accidents and related fatalities — Aircraft with a mass below 2 250 kg, by year and aircraft category

	Year	Number of accidents	Number of fatal accidents	Number of on board fatalities	Ground fatalities
Aeroplane	2006	571	75	124	2
Aeroplane	2007	489	59	108	0
Balloon	2006	29	0	0	0
Balloon	2007	15	0	0	0
Glider	2006	195	22	24	0
Glider	2007	173	17	19	1
Gyroplane	2006	5	1	1	0
Gyroplane	2007	5	3	4	0
Helicopter	2006	90	8	16	0
Helicopter	2007	80	11	21	4
Microlight	2006	200	36	45	0
Microlight	2007	187	20	26	0
Motorglider	2006	60	11	18	0
Motorglider	2007	48	11	16	0
Other	2006	46	10	10	2
Other	2007	55	12	14	0
Total	**2006**	**1196**	**163**	**238**	**4**
Total	**2007**	**1052**	**133**	**208**	**5**

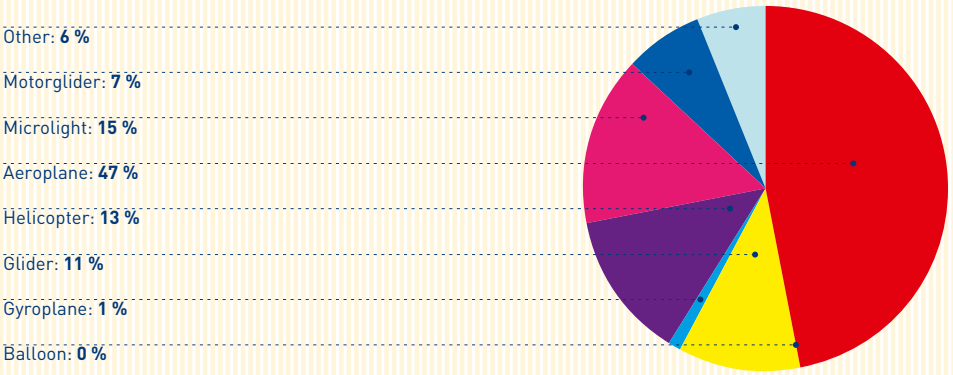
5.1 Fatal accidents

FIGURE 19 Aircraft below 2 250 kg, EASA MS — Fatal accidents, type of operation, 2006–2007



The vast majority of the light aircraft in EASA MS are involved in general aviation. Some, in particular light helicopters, are also involved in aerial work, e.g. aerial observation activities.

FIGURE 20 Aircraft below 2 250 kg, EASA MS — Fatal accidents, category of aircraft, 2006–2007



5.2 Accident categories

An attempt was made to apply the CICTT accident categories to the set of light aircraft data accidents for the year 2006. Their application to small, general aviation aircraft proved difficult.

FIGURE 21 Accidents — Aeroplanes below 2 250 kg, EASA MS — Distribution of accident categories, 2006

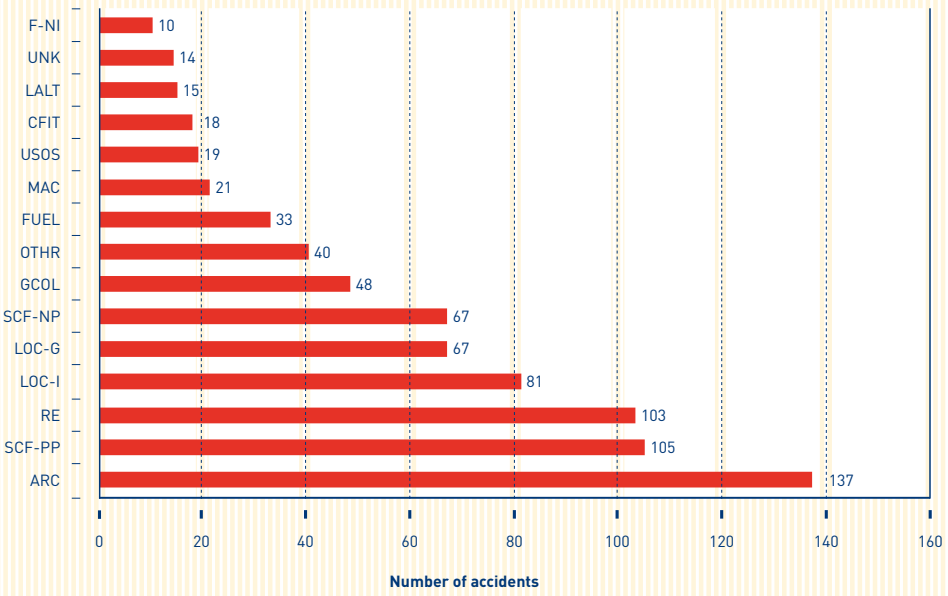
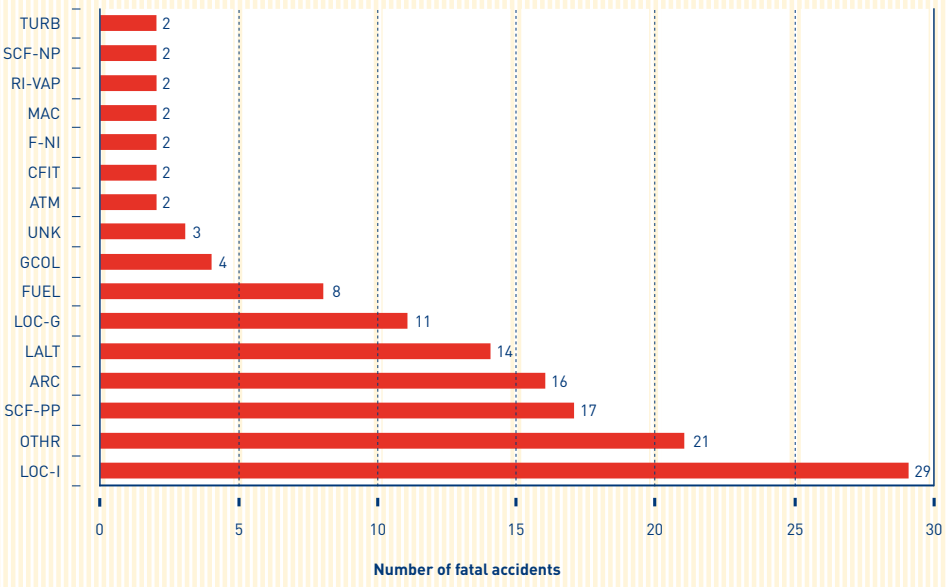


FIGURE 22 Fatal accidents — Aeroplanes below 2 250 kg, EASA MS — Distribution of accident categories, 2006



Analysis was based on the limited data available for the year 2006. The Agency will continue to attempt obtaining light aircraft accident data from EASA MS in order to provide more in-depth analysis. Based on the limited data at hand, it would appear that there is a major difference between the light aircraft accidents and those related to larger aircraft. A high number of light aircraft accidents involved powerplant related failures or malfunctions.

With only two years of data available, no trend could be developed. Further, analysis of causes was limited by the lack of complete data from EASA MS.

6.0 AGENCY'S SAFETY ACTIONS

In order to achieve its main objectives, EASA engages into several activities among which are certification, rulemaking and standardisation. These activities are reflected into its organisational structure through relevant directorates. The Certification Directorate engages, among others, in the certification of new or existing aircraft, engines and systems. Among the activities of the Rulemaking Directorate is the drafting of new or amendments to existing regulations pertaining to aviation safety. The Standardisation Directorate aims at standardising and maintaining safety levels in all EASA MS. To this end, this directorate engages in several activities among which are inspections of civil aviation authorities, aircraft operators and other stakeholders in the aviation industry.

6.1 Standardisation

The year 2007 has been a period of stabilisation for the standardisation activity of the Agency with respect to initial and continuing airworthiness. This came after a transition from a voluntary process derived from the previous Joint Aviation Authorities (JAA) system to a mandatory system supported by a proper legislation and structured implementation procedures highlighted in May 2006 through the issuance of Commission Regulation (EC) No 736/2006 on the working methods of the European Aviation Safety Agency for conducting standardisation inspections.

Although the continued surveillance was still based on a two-year periodicity, the scope of the visits for larger countries has been split up in order to allow more intensive inspections. In a few critical cases, visits on the same scope were repeated after one year.

As planned, the Agency performed a total of 28 visits in continuing airworthiness ([2]) and 12 in initial airworthiness ([3]).

Pending the extension of the remit of the Agency to operations and pilot licensing, these inspections were run as a JAA standardisation programme, fully staffed by the NAAs including the team leaders whenever possible. Standardisation visits carried out on behalf of the JAA are briefly described in Table 5.

[2] Greece, Belgium, Cyprus, Germany (NRW), United Kingdom, Hungary, Portugal, Norway, Estonia, Iceland, France, Poland, Netherlands, Monaco*, Turkey*, Italy, Luxembourg, Slovakia, Slovenia, Latvia, Finland, Sweden, Bulgaria, Romania, Spain, Switzerland, Croatia*, Serbia* (* = carried out on behalf of the JAA).

[3] Slovakia, Germany, Switzerland, Lithuania, Norway, Poland, Spain, Czech Republic, Finland, Sweden, Portugal, Denmark.

TABLE 5 Standardisation visits

Air operations	Bulgaria, Denmark, Spain, Estonia, Iceland, Greece, Slovenia, Czech Republic, Poland, Austria, Slovakia, Germany
Synthetic training devices (simulators)	Finland, Belgium, Italy, France, United Kingdom, Netherlands
Flight crew licensing and medical	United Kingdom, Norway, Serbia, Spain, Slovakia, Slovenia, Luxembourg, Czech Republic

6.2 Certification

Certification 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 certificate when it complies with all applicable safety requirements. In total, the Agency issued 7 000 design-related certificates in 2007.

In addition to the certification activities, another main task for the Certification Directorate is to actively ensure 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 accidents. This process is based on data provided through mandatory occurrence reporting, accident or incident investigations, type design reviews, etc.

On the basis of the investigation and analysis of the certificate holder, or of any other information, EASA defines appropriate actions that may lead, in case of determination of an unsafe condition, to issuance of airworthiness directives (ADs) to mandate appropriate corrective actions.

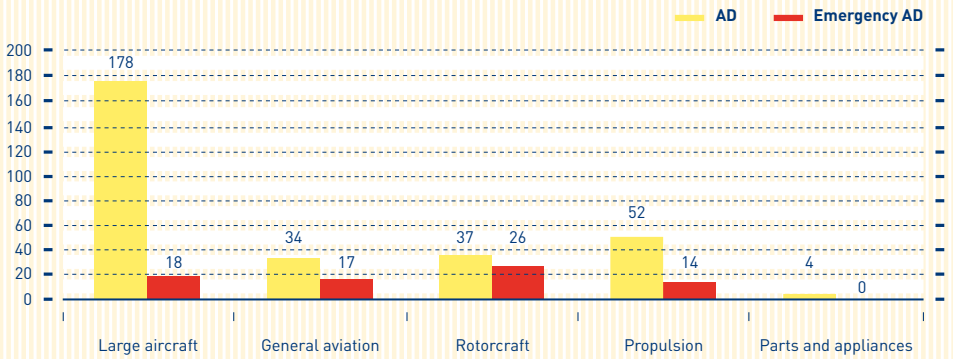
In 2007, the Agency mandated 305 ADs and 75 emergency ADs. With the creation of an "Airworthiness Directives, Safety Management and Research" Section in 2007, the Certification Directorate provides for consistency of the continuing airworthiness process.

In addition, long-term actions are performed, such as the creation of an Airworthiness Information Network with the Civil Aviation Authority of Singapore (CAAS) following the first delivery of A380 by Airbus to Singapore Airlines. As a follow-up to the release of ADs due to several landing gear incidents with the Bombardier Q400 (Dash 8) of Scandinavian Airlines (SAS) in September and October 2007, airworthiness review meetings with officials from Scandinavian and Canadian authorities as well as representatives of the aircraft manufacturer

Bombardier and the component manufacturer Goodrich were organised. All this is part of the Agency's and the Certification Directorate's approach to, among others, closely cooperate with European and non-European stakeholders through bilateral arrangements and to develop an innovative safety network with various States.

Regular audits by independent parties (such as ICAO) confirmed that the Agency/ Certification Directorate is on the right track towards fulfilling its obligations and contributes to a high level of aviation safety.

FIGURE 23 Number of ADs and emergency ADs mandated in 2007



6.3. Rulemaking

After consultation with stakeholders the Agency adopts an annual rulemaking programme which is published on its website. It is developed taking into account several criteria including existing in-service experience, the emergence of new technologies and concepts for operations or organisations as well as the compliance with international obligations. The rulemaking programme also takes into account the need to have rules proportionate to the risks. The main actions of 2007 included those listed below.

- Work related to the extension of the EASA system with regard to the interoperability and safety regulation of aerodromes.
- Work related to the continued operation of aircraft designed in the former Soviet Union that are currently registered in EASA MS.
- Amendments to the document entitled "Certification specifications for large aeroplanes" were adopted. These amendments aimed at improving required specifications for doors, flight and guidance systems as well as addressing issues related to flight in icing conditions and human factor considerations.

- Amendments were adopted regarding certification specifications for small and large rotorcraft (helicopters), improving specifications on flight and handling qualities.
- Amendments to the document entitled "Certification specifications for engines" were adopted, improving specifications in relation to electronic control systems.
- The standards for terrain awareness and warning systems were amended and a new standard for light aviation secondary surveillance transponders was introduced.
- Several other documents related to acceptable means of compliance were amended. These documents concerned various topics, among which are ageing aircraft structures, permit to fly and aircraft maintenance licences.

This *Annual safety review* highlights the high accident rates into certain regions of the world. The Rulemaking Directorate aims to address concerns about aircraft flying from lesser regulated regions with the following two actions, presently under development:

- approval of third countries' operators;
- technical assistance programmes.

Concerning commercial air transport by aeroplanes, the following actions have been taken.

- The development of an "Operational suitability certificate" that will define among other things a minimum syllabus for a flight crew type rating programme. This safety action is likely to reduce the risk of CFIT and LOC-I.
- The risk of accidents related to the propulsion system should be reduced by improvements in "Certification specifications for large aeroplanes" relative to low-level fuel alerts. Similar work on emergency exits and thermal insulation blankets may reduce the consequences of post-impact fires.
- Finally, system reliability should be improved through better specifications on electrical wiring systems.

Concerning commercial air transport by helicopters, existing helicopter specifications are being amended and regulatory material is being developed. This material will define among other things a minimum syllabus for a flight crew type rating programme. These activities are likely to reduce the risk of CFIT and loss of control for helicopters.

6.4 SAFA

Initially the SAFA programme was launched by the European Civil Aviation Conference (ECAC) in 1996, and was not based upon a European legal binding basis but upon a commitment of the directors-general of the participating ECAC Member States.

On 30 April 2004, Directive 2004/36/EC of the European Parliament and of the Council on the safety of third-country aircraft using Community airports (the so-called "SAFA directive") was published, creating a legal obligation upon EU Member States to perform ramp inspections upon "third-country aircraft" landing at their airports.

In each SAFA participating State, aircraft (third-country for EU States or foreign for non-EU ECAC States) can be subject to a ramp inspection, chiefly concerned with the aircraft documents and manuals, flight crew licences, the apparent condition of the aircraft and the presence and condition of mandatory cabin safety equipment. These inspections are based on ICAO relevant standards.

As of 1 January 2007, responsibility for the management and further development of the SAFA programme fell upon the European Commission assisted by EASA. The SAFA coordination activities have therefore been transferred from the Joint Aviation Authorities (JAA) to the Agency.

In addition, the SAFA database was also successfully transferred from the JAA to the EASA premises in Cologne, and is currently undergoing a major update with new enhancements and features (e.g. web-based features).

Regular analyses on a three-month basis have been performed as well as ad hoc analysis requested by the Commission to support "black list" decisions. The analysis of SAFA data has been delivering important indicators concerning the overall safety level of airlines operating in Europe, which helped identify potential risk factors and direct qualitative targeting.

Finally, in support of the Commission policy on international cooperation on exchange of safety data, exploratory technical discussions have been initiated with the FAA for mutually sharing data between the SAFA programme and the FAA's IASDEX programme.

6.5 The European Strategic Safety Initiative (ESSI)

The European Strategic Safety Initiative (ESSI) is a voluntary aviation safety partnership between EASA, other regulators and the industry, aiming at further enhancing aviation safety in Europe and for citizens worldwide. Launched on 27 April 2006, ESSI is the successor to the Joint Safety Strategy Initiative (JSSI) of the Joint Aviation Authorities (JAA).

For the complete list of the participating organisations, please visit the EASA website (www.easa.europa.eu/essi).

In line with its JSSI heritage, ESSI maintains and further develops cooperation with the Commercial Aviation Safety Team (CAST), the US Federal Aviation Administration (FAA) and the Flight Safety Foundation (FSF). ESSI, as one of the major safety team initiatives worldwide fits well within the global aviation safety roadmap (GASR). It provides a mechanism for coordinating safety initiatives within Europe and with the rest of the world.

6.5.1 ESSI safety teams

ESSI has three components: the European Commercial Aviation Safety Team (ECAST), the European Helicopter Safety Team (EHEST) and the European General Aviation Safety Team (EGAST).

European Commercial Aviation Safety Team (ECAST)

Launched on 12 October 2006, ECAST addresses large aircraft operations. With more than 50 participating organisations, it is Europe's equivalent of CAST.

ECAST monitors implementation in Europe 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 parallel, ECAST developed in 2007 a new three-phase process:

- Phase 1: Identification and selection of safety issues;
- Phase 2: Safety issues analysis; and
- Phase 3: Development, implementation and monitoring of action plans.

Phase 1 started in April 2007. The objective was to identify priorities for further ECAST work based on three criteria: safety importance, coverage (the extent to which the subjects are already covered in other safety work) and high-level costs benefits or impact assessment considerations.

In 2008 ECAST launched two working groups on safety management systems and ground safety, as part of Phase 2.

European Helicopter Safety Team (EHEST)

EHEST was launched on 14 November 2006. It brings together major helicopter airframe, engine and systems manufacturers, operators, regulators, helicopter and pilots associations, research organisations, accident investigators from across Europe and some military operators.

EHEST is also the European component of the International Helicopter Safety Team (IHST).

EHEST is committed to the IHST goal of reducing the helicopter accident rate by 80 % by 2016 worldwide.

The European Helicopter Safety Analysis Team (EHSAT) was formed by EHEST with the purpose of analysing European helicopter accidents, using a process adapted from IHST.

More than 50 organisations participate in EHEST to date, of which around 30 are involved in EHSAT. To tackle the variety of languages used in accident reports and optimise the use of resources, EHSAT has established regional analysis teams. The results of the regional teams will be presented in the IHST Europe 2008 conference at Helitech, Estoril, Portugal, on 13 October 2008.

European General Aviation Safety Team (EGAST)

The foundation meeting of the European General Aviation Safety Team (EGAST) took place at EASA on 17 October 2007 and was attended by over 60 representatives of the general aviation community from across Europe.

"General aviation has a high priority for the European Aviation Safety Agency. EGAST is a new venture in Europe and a challenge. The Agency welcomes the wide participation of the aviation community, as part of its overall efforts to revitalise general aviation," said Patrick Goudou, Executive Director of EASA at the opening session.

General aviation is a community made of very diverse components such as business aviation, aerial work, air sports and recreational activities. Recreational aviation itself features a wide spectrum of airborne activities ranging from powered flying, ballooning and gliding to microlight flying, paragliding and hang-gliding. EGAST responds to the need for a coordinated European effort.

Building on the general aviation initiatives in Europe, EGAST creates a forum for promoting safety, improving data collection and analysis, and sharing best practices, including on safety management.

For further information, refer to the ESSI website (www.easa.europa.eu/essi).

APPENDIXES

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 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 occurrence category taxonomy has limited usefulness when applied to helicopters, light aircraft and other aviation activities such as hang-gliding or parachuting. New approaches will need to be developed to better trace the safety concerns in this segment of the aviation system. Consideration must be given to develop specific categories for such operations. The Agency will engage its partners with a view to address this issue.

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/Air Traffic Management
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.
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)
Foreign registered aircraft	All aircraft not registered in one of the EASA MS.
General aviation (GA)	An aircraft operation other than a commercial air transport operation or an aerial work operation.
ICAO	International Civil Aviation Organisation
Light aircraft	Aircraft with a maximum certificated take-off mass below 2 250 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.
SISG	ICAO Safety Indicator Study Group
Third-country aircraft	An aircraft which is not used or operated under control of a competent authority of an EU Member State.

A2-2: Accident categories acronyms

ARC	Abnormal runway contact
AMAN	Abrupt manoeuvre
ADRM	Aerodrome
ATM	ATM/CNS
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

A3-2 List of tables

Appendix 4: Listing of fatal accidents (2007)

The following tables contain a listing of fatal accident in 2007 with commercial air transport operations with aeroplanes over 2 250 kg maximum certificated take-off mass only.

EASA MS

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities
25.1.2007	France	Fokker 100	Passenger	0	1
9.8.2007	French Polynesia	De Havilland DHC6-300	Passenger	20	0
9.12.2007	Ukraine	Beech 90 King Air	Passenger	5	0

Aircraft registered in rest of the world (foreign registered)

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities
1.1.2007	Indonesia	Boeing 737-400	Passenger	102	0
5.1.2007	Tanzania	Piper PA-31-350	Passenger	1	0
5.1.2007	Sudan	Antonov An-26B	Passenger	0	1
7.1.2007	Canada	Beech 100 King Air	Air taxi	1	0
9.1.2007	Iraq	Antonov An-26B	Passenger	34	0
9.1.2007	Mexico	Learjet 24	Cargo	2	0

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities
12.1.2007	United States	Cessna 525 Citationjet	Ferry/ positioning	2	0
18.1.2007	Brazil	Beech 55/95-55 Baron	Air taxi	2	0
6.2.2007	United States	Beech 200 King Air	Ferry/ positioning	3	0
9.2.2007	United States	Beech 18	Cargo	1	0
12.2.2007	Congo	McDonnell-Douglas DC-9	Unknown	0	1
7.3.2007	Indonesia	Boeing 737-400	Passenger	21	0
14.3.2007	Brazil	North American Commander 500	Air taxi	4	0
17.3.2007	Russian Federation	Tupolev TU-134	Passenger	6	0
23.3.2007	Somalia	Ilyushin IL-76	Cargo	11	0
30.3.2007	Papua New Guinea	Embraer 110 Bandeirante	Cargo	2	0
1.4.2007	Canada	Piper PA-31	Ferry/ positioning	1	0
25.4.2007	Guyana	Britten-Norman BN-2A Islander	Passenger	3	0
5.5.2007	Cameroon	Boeing 737-800	Passenger	114	0
17.5.2007	Congo	Let L410UVP	Cargo	3	0
2.6.2007	Canada	De Havilland DHC3 Turbo-Otter	Air taxi	1	0
4.6.2007	United States	Cessna 550 Citation II	Passenger	6	0
15.6.2007	Iran	Embraer 110 Bandeirante	Cargo	0	1
21.6.2007	Congo	Let L410UVP	Passenger	1	0
23.6.2007	Yemen	De Havilland DHC6 Twin Otter	Passenger	1	0
25.6.2007	Cambodia	Antonov An-24	Passenger	22	0
28.6.2007	Angola	Boeing 737-200	Passenger	5	1
5.7.2007	Mexico	North American Sabreliner	Cargo	3	6
8.7.2007	Canada	De Havilland DHC6 Twin Otter	Passenger	1	0
10.7.2007	United States	Boeing 737-200	Passenger	1	0

Date	State of occurrence	Aircraft type	Type of operation	Fatalities on board	Ground fatalities
17.7.2007	Brazil	Airbus A320	Passenger	187	12
18.7.2007	Congo	Antonov An-24	Passenger	10	0
23.7.2007	Ethiopia	Antonov An-26	Cargo	1	0
24.7.2007	United States	De Havilland DHC2 Beaver	Sightseeing	5	0
29.7.2007	Russian Federation	Antonov An-12	Cargo	7	0
5.8.2007	United States	Beech 90 King Air	Passenger	5	0
16.8.2007	United States	De Havilland DHC2 Beaver	Sightseeing	5	0
22.8.2007	Brazil	Embraer 110 Bandeirante	Air taxi	2	0
26.8.2007	Congo	Antonov An-32	Cargo	10	0
7.9.2007	Congo	Antonov An-12	Cargo	8	0
16.9.2007	Thailand	McDonnell-Douglas MD 82	Passenger	90	0
20.9.2007	United States	Short SC.7 Skyvan	Ferry/ positioning	1	0
24.9.2007	Congo	Let L410UVP	Passenger	1	0
4.10.2007	United States	Raytheon 90 King Air	Ferry/ positioning	3	0
4.10.2007	Congo	Antonov AN-26	Passenger	17	28
8.10.2007	Colombia	Let L410UVP	Passenger	18	0
14.10.2007	Colombia	Beech 200 King Air	Ferry/ positioning	5	2
25.10.2007	Canada	Beech 100 King Air	Air taxi	2	0
4.11.2007	Brazil	Learjet 35A	Ferry/ positioning	2	6
8.11.2007	Sudan	Antonov An-12	Cargo	0	2
26.11.2007	United States	Cessna 310R	Ferry/ positioning	1	0
30.11.2007	Turkey	McDonnell-Douglas MD 83	Passenger	57	0
5.12.2007	United States	Cessna 208 Caravan	Cargo	2	0

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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