



# 2012 Safety Report



# A Coordinated, Risk-based Approach to Improving Global Aviation Safety

A specialized agency of the United Nations, the **International Civil Aviation Organization (ICAO)** was created in 1944 to promote the safe and orderly development of international civil aviation throughout the world.

ICAO sets the Standards and Recommended Practices necessary for aviation safety, security, efficiency and environmental protection on a global basis. It serves as the primary forum for co-operation in all fields of civil aviation among its 191 Member States.<sup>1</sup>

Improving the safety of the global air transport system is ICAO's guiding and most fundamental Strategic Objective. The Organization works constantly to address and enhance global aviation safety outcomes through the following coordinated activities:

**Policy and Standardization** initiatives.

**Monitoring** of key safety trends and indicators.

Safety **Analysis**.

**Implementing** programmes to address safety issues.

In every case, these activities are augmented by ICAO's detailed appraisal of global aviation safety metrics on the basis of established risk management principles—a core tenet of contemporary State Safety Programmes (SSP) and Safety Management Systems (SMS). Applying these principles in the field of aviation safety requires the Organization to pursue a coherent and consistent process of objective analysis, both proactive and reactive as applicable, in particular when evaluating safety risks.

In all of its coordinated safety activities, ICAO strives to achieve a balance between assessed risk and the requirements of practical, achievable mitigation strategies.

As announced in the 2011 Special edition of the ICAO State of Global Aviation Safety report, this first annual report provides updates on the accidents of 2011 and related key risk factors, taking as a benchmark the 2011 special edition report. This edition also includes success stories of 2011.

<sup>1</sup> This information is current as of the date of publication of this report.



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**Note:**

The United Nations' definitions of regions are used in the report.

This document focuses primarily on scheduled commercial flights as this type of traffic accounts for more than 60% of the total fatalities.

The scheduled commercial flights data was based on the Official Airline Guide (OAG).



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# Executive Summary

The growth in volume of commercial scheduled flights seen in 2010 continued in 2011 at the rate of 3.5%. This increase coincides with an increase of 3.7% in the global real Gross Domestic Product (GDP).

The number of accidents grew by 4.1% and the global accident rate for 2011 remains unchanged at approximately four accidents per million departures.

The number of fatalities has decreased by 41.4%, making 2011 the safest year with regard to fatalities since 2004. Improved runway safety was a key element for this decrease with no fatal runway safety accidents occurring in 2011.





# Traffic Overview

The number of accidents attributed to scheduled commercial flights increased in 2011 to 126, compared to 121 in 2010. This increase is consistent with the related increase in traffic and therefore did not significantly affect the global accident rate which remained stable at 4.2 accidents per million departures.

The overall number of fatalities in 2011 has significantly dropped making 2011 one of the safest years with regard to loss of life for the last decade. However, a decreasing trend

in fatalities cannot be established at this time due to the volatility of this indicator.

The ICAO Universal Safety Oversight Audit Programme (USOAP) continues to promote the systematic implementation of ICAO Standards and Recommended Practices (SARPs). As of the end of 2011, the USOAP had completed assessments of 95% of ICAO Member States, accounting for 99% of all traffic flown.

Worldwide Traffic Volume: 2005–2011 *Scheduled commercial flights*



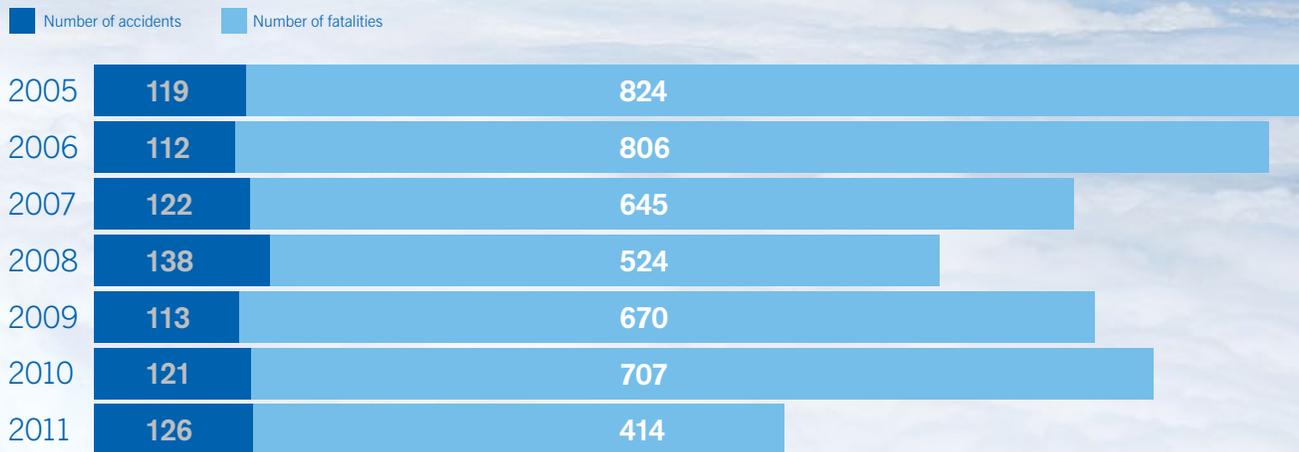


Co-operation has been a consistent goal and recognized strength of the aviation community. To keep pace with expansion and progress sector-wide, ICAO remains focused on the implementation and development of new safety initiatives. The Runway Safety Programme and Fatigue Risk Management Systems are examples of how ICAO is working with stakeholders to identify and mitigate hazards.

The Organization is committed to improving aviation safety and enabling seamless co-operation and communication between stakeholders. ICAO continues to collaborate with

established regional organizations, such as Regional Aviation Safety Groups (RASGs) and Regional Safety Oversight Organizations (RSOs), and to promote the training and support necessary to address emerging safety issues. In addition, ICAO continues to actively engage with other agencies of the United Nations – including the World Meteorological Organization and International Atomic Energy Agency – in preparing for and responding to natural or manmade hazards such as volcanic eruptions and radiation emergencies that impact global air navigation safety and efficiency.

### Accident Records: 2005–2011 *Scheduled commercial flights*



## The Bottom Line

The continued growth in traffic experienced in 2011 was coupled with an increase in the number of accidents, resulting in an accident rate of 4.2 per million departures—stable compared to the previous year. ICAO is working in partnership with the international aviation community to achieve continuous reductions in the global accident rate, with an emphasis to improve safety performance in those

regions experiencing significantly higher accident rates or having specific safety challenges. This report provides a summary of key indicators with reference to the 2011 special edition that define the scope and nature of the safety issues within global air transportation system, as well as an overview of the collaborative safety initiatives undertaken to address them at the global, regional and national levels.

# USOAP Status

Each ICAO Member State, in its effort to establish and implement an effective safety oversight system that reflects the shared responsibility of the State and the broader aviation community, should address all of the eight Critical Elements (CEs) as highlighted by ICAO. These eight categories address the entire spectrum of a State's civil aviation activity.

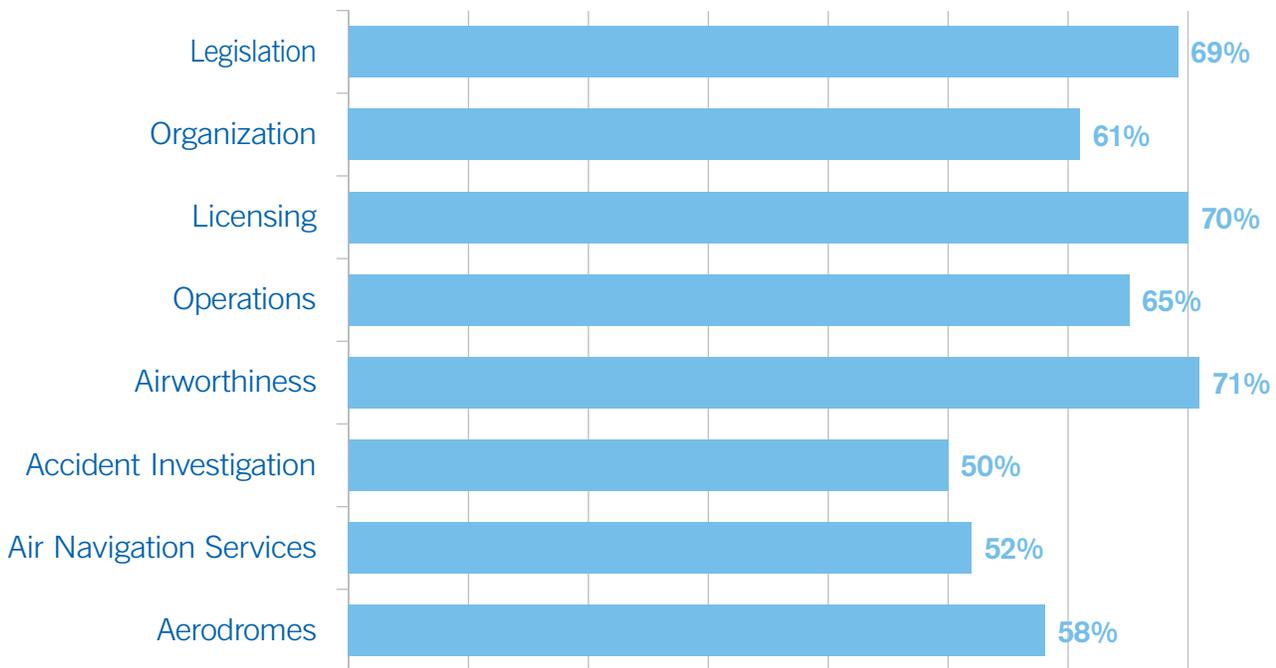
To standardize the conduct of its audits under the USOAP, ICAO has established audit protocol questionnaires. The protocol questions are based on the Chicago Convention, SARPs established in the safety-related Annexes to the

Convention, as well as associated ICAO guidance material including, but not limited to, the ICAO safety oversight manual (Doc 9734—*The Establishment and Management of a State's Safety Oversight System*).

Each audit protocol is a comprehensive checklist covering all areas of a State's safety oversight system subject to the USOAP audit process. Using the audit protocol as a guideline, auditors are then able to determine a State's capability for safety oversight.

## Global Audit Results

### Effective Implementation of Safety Oversight Systems by Area





■ States having Effective Implementation above the global average



### States, listed in alphabetical order, having Effective Implementation above the global average

Argentina	Croatia	Ghana	Latvia	Philippines	Togo
Armenia	Cuba	Greece	Lithuania	Poland	Trinidad and Tobago
Australia	Cyprus	Guatemala	Luxembourg	Portugal	Tunisia
Austria	Czech Republic	Hungary	Malaysia	Republic of Korea	Turkey
Belgium	Democratic People's Republic of Korea	Iceland	Malta	Romania	Turkmenistan
Belize	Denmark	India	Mauritania	Russian Federation	Ukraine
Bolivia (Plurinational State of)	Dominican Republic	Indonesia	Mexico	Saudi Arabia	United Arab Emirates
Bosnia and Herzegovina	Ecuador	Iran (Islamic Republic of)	Mongolia	Serbia	United Kingdom of Great Britain and Northern Ireland
Brazil	Egypt	Ireland	Montenegro	Singapore	United States of America
Brunei Darussalam	El Salvador	Israel	Morocco	Slovakia	Uzbekistan
Bulgaria	Estonia	Italy	Netherlands	Slovenia	Venezuela (Bolivarian Republic of)
Canada	Ethiopia	Japan	New Zealand	South Africa	Zimbabwe
Cape Verde	Fiji	Jordan	Nicaragua	Spain	
Chile	Finland	Kenya	Nigeria	Sri Lanka	
China	France	Kuwait	Norway	Sudan	
Colombia	Gambia	Kyrgyzstan	Pakistan	Sweden	
Costa Rica	Germany	Lao People's Democratic Republic	Panama	Switzerland	
			Peru	Thailand	



# Accident Statistics

As its primary indicator of aggregate safety in the global air transport sector, ICAO studies the accident rate based on scheduled commercial air traffic with a Maximum Take-off Weight (MTOW) above 2250 kg. Aircraft accidents are categorized using the definition provided in Annex 13 to the Chicago Convention—*Aircraft Accident and Incident Investigation*.

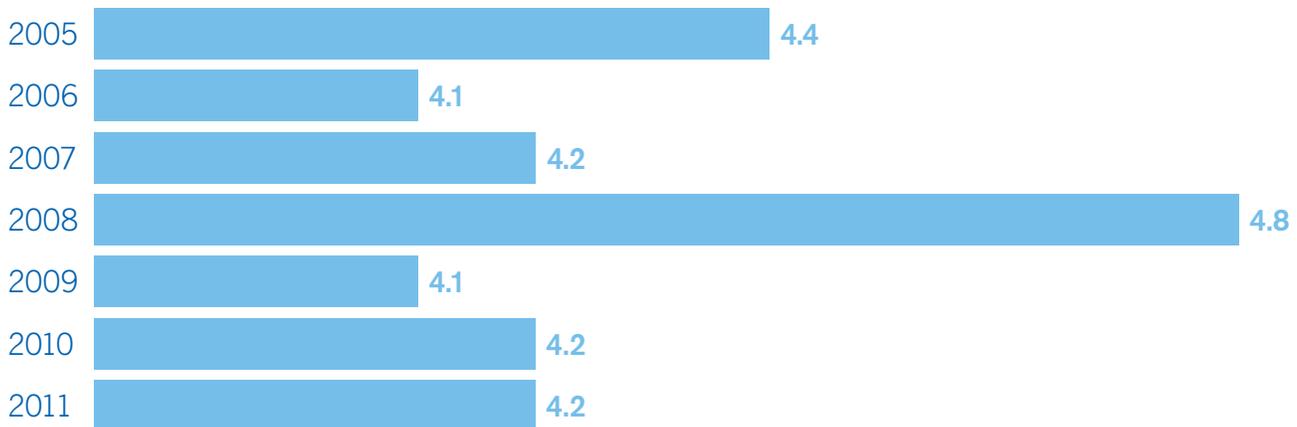
Exposure data is comprised of scheduled commercial operations that involve the transportation of passengers, cargo and mail for remuneration or hire.

The chart below shows the change in the accident rate since 2005, with 2011 having an accident rate of 4.2 accidents per million departures.

In addition to the global accident rate as calculated historically, ICAO is committed to working with its partners through the Global Safety Information Exchange (GSIE) to develop a harmonized accident rate, based on common criteria. Details on the GSIE harmonized accident rate can be found later in this report.

## Global Accident Rate

Accidents per million departures



## Regional Accident Statistics

To further analyze the state of aviation safety, the accident data for scheduled commercial air transport was broken down according to United Nations regions. The table below provides insight into the state of aviation safety in different regions in the context of global outcomes.

While Africa had the highest regional accident rate, it also accounted for the lowest percentage of global traffic volume, 3% of scheduled commercial traffic.

Asia experienced the lowest regional accident rate in 2011 (2.9%) with three accidents resulting in fatalities.



The accident rate for the European region was above the global accident rate in 2011, with 10% of accidents resulting in fatalities.

Latin America and the Caribbean had a higher than average accident rate, of which 26% resulted in fatalities. This region accounted for 9% of scheduled commercial traffic.

North America's accident rate was below the world average and, despite having the highest number of accidents, it experienced no fatal accidents for the year 2011.

The Oceania region had the lowest number of accidents but had two fatal accidents in scheduled commercial air transport for the year 2011.

The considerable variance in traffic volume among regions is a factor which needs to be considered when drawing broader conclusions from accident rate information.

### Accident Statistics and Accident Rates: 2011

UN Region	Traffic (thousands)	Accidents		Fatal Accidents
		Number	Rate <sup>2</sup>	
Africa	891	7	7.9	3
Asia	7,561	22	2.9	3
Europe	7,143	39	5.5	4
Latin America and the Caribbean	2,625	15	5.7	4
North America	10,979	38	3.5	0
Oceania	855	4	4.7	2
<b>World</b>	<b>30,053</b>	<b>126</b>	<b>4.2</b>	<b>16</b>

Note: One accident occurred in international waters and is not associated with any region.

The table below reflects the percentage of accidents in the context of overall traffic share per region. While regional accident rates are often used to determine safety performance, the volatility of such indicators varies significantly according to the wide disparity in regional traffic volumes.

Larger traffic volumes reduce the impact of individual accidents on the overall accident rate, requiring complementary data to round out the scope and nature of regional safety outcomes.

### Accidents and Traffic Distribution: 2011

UN Region	Percentage	
	Traffic	Accidents
Africa	3%	6%
Asia	25%	17%
Europe	24%	31%
Latin America and the Caribbean	9%	12%
North America	37%	30%
Oceania	3%	3%

<sup>2</sup> The accident rate is defined by the number of accidents per million departures



### Enhanced Procedures to Investigate Accidents and Incidents

In the case of an accident involving a large and/or complex aircraft, a large team of investigators is usually required to conduct the investigation. The effective conduct of a major investigation requires a management system based on comprehensive plans, checklists and flow charts to track the progress of the investigation; this is called Investigation Management System.

In May 2012, ICAO published the first edition of the Manual of Aircraft Accident and Incident Investigation, Part II – Procedures and Checklists (Doc 9756). The manual addresses the procedures, practices and techniques to be used in investigations, including comprehensive guidance on Investigation Management System and a Major Accident Investigation Guide (MAIG). Among others, guidance is provided on the size and scope of major accident investigations, as well as smaller investigations of accidents and incidents.

### Assistance to Aircraft Accident Victims and Their Families

The 32nd Session of the ICAO Assembly in 1998 called on States to reaffirm their commitment to support accident victims and their families, and to review, develop and implement relevant regulations and programmes. The Assembly also urged ICAO to develop material on the need for the establishment of relevant regulations and programmes by States and aircraft operators. Accordingly, ICAO Circular 285, *Guidance on Assistance to Aircraft Accident Victims and their Families*, was published in 2001. To date, only a few States outside of the European Union and the United States have implemented such programmes. Acknowledging that further action is necessary to promote the assistance to victims and their families, ICAO recently established the Assistance to Aircraft Accident Victims Policy Task Force that will develop an ICAO policy document addressing this matter, so as to enhance the provisions to assist victims and their families following an accident. The policy document is envisaged to be issued in mid-2013.





# Technical Co-operation and Assistance Activities

## Success Stories

The cooperative spirit of ICAO's Member States has been consistently demonstrated through financial and technical assistance projects that have succeeded in raising the level

of global civil aviation safety. The following represent a cross-section of some of the State-to-State assistance success stories that have resulted in positive aviation safety outcomes.



### Australia

Five Australian governmental agencies are involved in programmes of co-operation and assistance with States in the Asia Pacific region, in particular, with Indonesia and Papua New Guinea. These agencies are the Department of Infrastructure and Transport, the Civil Aviation Safety Authority, the Australian Transport Safety Bureau, Airservices Australia and the Australian Maritime Safety Authority. The co-operation and assistance programmes enhance regional aviation safety through training, mentoring, and capability building activities. Australia actively supports the Pacific Aviation Safety Office (PASO), a cooperative regional safety oversight organization created to assist its Member States in meeting international obligations. As a member of PASO, Australia is providing financial support and practical assistance to the Organization.



### China

China has participated in the ICAO Cooperative Development of Operational Safety and Continuing Airworthiness Programme – North Asia (COSCAP-NA) by providing office space, equipment, training facilities and meeting rooms. Since 2008, China has contributed 1.26 million USD to COSCAP-NA projects, the Comprehensive Regional Implementation Plan for Aviation Safety in Africa, and the SAFE Fund. China has sponsored training courses for more than 150 professional and technical personnel from developing countries. China has also donated office space and equipment for the ICAO Flight Procedure Project in the Asia and Pacific Region and seconded five personnel, with donations totalling 20,000 USD to the Project.





## Technical Co-operation and Assistance Activities



### Japan

Japan Civil Aviation Bureau (JCAB) has dispatched experts to other countries to assist in aviation safety activities. JCAB has dispatched to five countries in South-East Asia sixteen experts in the fields of the air traffic control and air navigation systems, three experts in aircraft operations and one expert in airport planning. The Japanese Government holds annual seminars for aviation safety, including a seminar on RNAV route design that was attended by ten civil aviation officers from six Asian countries. A seminar on airport planning had participation by ten civil aviation officers from seven countries in Asia, Oceania and Africa. JCAB also focuses efforts on co-operation related to massive natural disasters. JCAB dispatched two experts to Thailand to assist in airport facility restoration work from the damage by massive flooding in 2011. The Japanese Government took a unique approach in 2012 by holding a seminar on air navigation services after the Great East Japan Earthquake and used its own disaster-affected experiences to share knowledge about the response, the situation of recovery in the disaster area and the reconstruction plan for the future. The seminar participants were provided the opportunity to utilize this valuable information in planning disaster protection measures and for disaster response in each participant's country.



### Netherlands

The Ministry of Infrastructure and the Environment in the Netherlands has financed a programme for the benefit of aviation safety in the East African Community, composed of Kenya, Tanzania, Uganda, Rwanda and Burundi. The aim of the programme is to improve the effectiveness of risk mitigation in the areas of airport safety, aeronautical information services and airport rescue and firefighting. The programme provides knowledge transfer on best practices, new technology and equipment, procedures and regulations and safety management systems. The Ministry also financed the development of airport safety and security in Suriname, including providing an airport safety and security expert to assist in the management of the international airport. This project includes the goals of improving the management structure of the airport and the deployment of efficient rescue and firefighting by trained personnel.



### Singapore

Singapore, through the Singapore Aviation Academy, has provided training fellowships to over 4,700 personnel from some 170 countries. Singapore has seconded staff to ICAO for aviation safety-related matters, including aviation medicine. As a member of the COSCAP-SEA, Singapore has contributed 682,000 USD in terms of training alone, and has provided technical assistance and expertise to enhance aviation safety standards in the region.



### United States

Three U.S. governmental agencies are actively involved in aviation safety programmes through co-operation and assistance. The U.S. Trade and Development Agency (USTDA) has structured bilateral agreements with China, India and Brazil for technical co-operation in the aviation sector, and has provided funding for aviation safety initiatives. In China, the USTDA is supporting eight aviation workshops to provide managerial, technical, safety and operational training for officials from the Civil Aviation Administration of China (CAAC) and for airport managers. These workshops allow representatives from U.S. and China to collaborate on policy, standards and best practices. The USTDA also awarded a grant to the Airports Authority of India (AAI) for the installation and certification of a ground-based augmentation system at Chennai International Airport. In Brazil, the USTDA is funding the preparation of a master plan for the development of a regional airport system, including investments for runway pavement, air navigation equipment and emergency response. The Department of Transportation, through the Safe Skies for Africa initiative, provided funding to the Federal Aviation Administration (FAA) for a runway safety and airport pavement maintenance seminar for sub-Saharan African countries, hosted by Nigeria. The Safe Skies for Africa programme is also funding a multi-year aeronautical meteorology distance-learning project for Africa that will help aeronautical forecasters meet the upcoming standards set by ICAO and the World Meteorological Organization (WMO). The FAA continues to provide assistance to the Partner States of the East African Community, and has posted two FAA aviation safety inspectors in Entebbe, Uganda, to provide expertise and on-the-job-training.



## European Investment Bank

As the financing arm of the European Union (EU), the European Investment Bank (EIB) supports long-term investment projects both inside and outside Europe, including airport development projects, air traffic management programmes, aviation research and development, and in special circumstances, the acquisition of aircraft. The objectives of these projects are to increase service levels, improve conformance with aviation safety standards, enhance environmental performance and promote economic growth and development. The EIB financed in 2011 the upgrade and expansion of five airports in Tanzania with the goals of ensuring all-weather operational capability, enhancing the reliability of access to remote regions and boosting regional economic development.



## World Bank Group

The World Bank (WB) is a vital source of financial and technical assistance to developing countries around the globe through low-interest loans, interest-free credits and grants. Infrastructure rehabilitation, institutional strengthening and capacity building remain the core objectives of these projects. The World Bank is involved with almost thirty projects worldwide, including new projects in Latin America, the Caribbean and sub-Saharan Africa, amounting to more than 97 million USD in new commitments. Reducing vulnerability to natural disasters has become particularly important in the Caribbean region. The World Bank has contributed funding and grants for airport initiatives, including projects in Tanzania, Kenya, Sierra Leone, Democratic Republic of Congo, Egypt, Bolivia, Grenada, Haiti, Pakistan, Tonga, Dominican Republic, Jamaica, Tunisia, Cambodia, Jordan and Georgia.



### Boeing

Boeing provides technical experts and contractors at the request of civil aviation authorities. Boeing representatives are working with Indonesia to prepare for an upcoming FAA Technical Review scheduled for 2012. A Boeing regulatory affairs team is assisting Egypt in preparing for an FAA International Aviation Safety Assessment scheduled for later in 2012. Boeing and the USTDA have been working with the Civil Aviation Authority of Vietnam to establish an aviation legal framework that meets ICAO standards, and Boeing will assist the State in preparing for an FAA Technical Review. Boeing officials and contractors are providing training to officials of the Civil Aviation Authority of the Philippines, and Boeing is providing specialized training to civil aviation authority inspectors from Kenya and Rwanda.



### Airbus

Airbus has provided financial contributions and technical experts to the COSCAP-CIS, COSCAP-SA, COSCAP-SEA and COSCAP-NA. Combined with other financing, Airbus has provided an annual total contribution for ICAO initiatives of 250,000 USD. Airbus contributed to the approval by the Civil Aviation Authority of Nepal of reduced navigation performance (RNP) approach procedures at Katmandu International Airport, and assisted in developing RNP procedures at Vagar Airport in the Faeroe Islands. Airbus is contributing to an aviation project in the Philippines affecting eleven airports, that includes the training of staff from the country's Civil Aviation Authority, in coordination with the French civil aviation school (ENAC) and the French civil aviation authority (DGAC).





### Central European Rotation Group

The Central European Rotation Group (CERG) represents on the Council of ICAO the States of Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia. CERG coordinated a series of three international courses for safety experts and investigators in Prague in 2012 that was presented by the Southern California Safety Institute in co-operation with the Czech Republic. Fifty safety experts and investigators participated in the courses from Poland, Germany, Norway, Sweden, Hungary, Romania, Netherlands, Czech Republic, Slovakia, the United Kingdom, Slovenia, Eurocontrol, Republic of Korea, Kazakhstan, Uganda and Nigeria. Course subjects were aircraft accident investigation, human factors for investigators and safety management systems. CERG members are making preparations for an ICAO/CERG Air Law Conference in Warsaw later in the year. The conference will focus on issues in the international legal framework pertaining to aviation safety, including unmanned aircraft systems and licensing and training.

### Flight Safety Foundation

The Flight Safety Foundation has established a new audit programme targeting smaller air operators engaged with the mining industry, known as the Basic Aviation Risk Standard (BARS). More than 100 BAR audits have been completed to date. In the spring of 2012, the Foundation partnered with ICAO, Indonesia, and the Association of Asia Pacific Airlines to host the Asia-Pacific Regional Runway Safety Seminar in Bali, with 273 participants from 24 States. Topics included the benefits of establishing runway safety teams, the identification of runway safety hazards, defining available mitigation strategies, and regional support for runway safety teams. Foundation representatives participated in regional seminars, including the Africa Aviation Safety and Security Conference, the World Food Programme Aviation Safety Forum and the Africa AeroMed Convention.



### European Civil Aviation Conference

One of the objectives of the European Civil Aviation Conference (ECAC) is to share Europe's expertise in aviation matters with neighbouring countries and organizations through cooperative relationships. The ECAC has signed a number of Memoranda of Understanding with regional groups and States, and these typically include co-operation in the field of aviation safety, exchange of information, workshops and capacity building activities. The ECAC has engaged in safety information exchanges with the Russian Federation and the Republic of Korea. Accident and incident investigation workshops have been organized with participants from the aviation authorities of Israel, Morocco, Singapore, Guatemala, China, Egypt, Lebanon, and Tunisia. ECAC's signing of a Memorandum of Co-operation with ICAO in 2010 has led to collaboration in promoting sustained levels of safety within and beyond the European region. As an associated body of ECAC, the Joint Aviation Authorities Training Organization has conducted training courses on European rules and ICAO Standards to both authority and aviation industry personnel at various locations.



### International Air Transport Association

The International Air Transport Association (IATA), ICAO, and the International Federation of Airline Pilots' Associations collaborated on developing a guide on fatigue risk management systems. The guide has been distributed at aviation workshops as an alternative to traditional flight and duty time rules. With fatigue increasingly being cited as a contributing factor in accidents, methods for fatigue mitigation are included in the guidance. Workshops on fatigue risk management have been conducted in Miami, London, Moscow, Rio de Janeiro and Lima, as well as in Beijing in late 2012. IATA has created a task force to provide leadership to industry on fatigue risk management issues. IATA and ICAO also joined forces on the development of a 2nd Edition Runway Excursion Risk Reduction Toolkit. This 2nd Edition includes an industry-wide survey, a study of air operator flight data analysis programmes and case studies for use in workshops and classrooms. The Toolkit has been presented and distributed at various aviation events, summits, workshops and seminars.



### Ongoing Assistance Initiatives

Over 2012, ICAO has been actively engaged in a wide range of assistance activities that will help States strengthen their safety oversight system.

#### ICAO Plans of Action

As part of the effort to assist States in resolving safety deficiencies identified by the ICAO Universal Safety Oversight Audit Programme (USOAP), ICAO has developed State-specific tailored plans of action proposing a series of remedial technical and political actions. As of August 2012, ICAO has developed 21 Plans of Action that have been accepted by the States for implementation.

#### Aviation Safety Targets

ICAO has actively collaborated with the African Civil Aviation Commission (AFCAC) to develop new aviation safety targets focused on addressing various safety issues in Africa, such as: the prompt resolution of Significant Safety Concerns, the progressive reduction of the African accident rate, the establishment of independent and adequately funded civil aviation authorities, the timely implementation of ICAO Plans of Action, the effective implementation of safety oversight systems, among others. The aim of setting these targets is to expeditiously facilitate the implementation of new or ongoing activities designed to resolve the safety issues. The safety targets were unanimously approved by the African Ministerial meeting on Aviation Safety held in Abuja, Nigeria from 16 to 20 July 2012. The completion of each initiative range from 2013 to 2017.

#### Cooperative Inspectorate Scheme in Africa (AFI-CIS)

ICAO has also been actively involved in the cooperative inspectorate scheme in the AFI region (AFI-CIS) since its onset in December 2010. The purpose of this programme is to share qualified inspectors within the region in a cost-effective and efficient way. The scheme is implemented by AFCAC with the support of ICAO.

#### Regional Safety Oversight Organizations (RSOOs)

ICAO has continued to provide assistance to the regional safety oversight organizations (RSOOs). A study was conducted on the Civil Aviation Safety and Security Oversight Agency (CASSOA) representing the five East African Community (EAC) Partner States (Burundi, Kenya, Rwanda, United Republic of Tanzania and Uganda). The purpose of the study was to review the legal, organizational and financial frameworks of CASSOA, and to provide recommendations aimed at enhancing the Organization and role of the Agency.

#### Co-operation with the World Bank

At the request of the World Bank, ICAO provided assistance in the implementation of its Pacific Aviation Investment Program (PAIP) aimed at the aviation infrastructure improvement of the three States in the Pacific Island region (Republic of Kiribati, Tonga and Tuvalu). ICAO experts conducted a safety audit of the five airports in the States, in order to determine the level of their compliance with the international standards as stipulated in ICAO Annex 14 – Aerodromes. The audit results will be used as a baseline to develop action plans for the implementation of the PAIP.

In order to ensure that ICAO plays a leading role in assisting the implementation, where appropriate, ICAO has been closely monitoring the progress made by the concerned States in the implementation of these initiatives.

#### Safety Collaborative Assistance Network (SCAN)

SCAN was formed to serve as a facilitator and coordinator for the exchange of safety-related information regarding financial and technical assistance projects and activities. SCAN is compiling a list of existing assistance programmes and proposed assistance projects in need of funding, based upon an analysis of safety-related data from a variety of sources. SCAN participants include focal points from government agencies, regional groups, manufacturers, financial institutions and aviation organizations that provide financial and/or technical assistance pertaining to civil aviation. The SCAN website can be accessed at: <http://www2.icao.int/en/scan>.

#### Search and Rescue Training Initiatives

In late 2011, a Search and Rescue (SAR) training course and seminar, fully funded by the General Civil Aviation Authority of the United Arab Emirates, was held at the Aviation Training Academy in Johannesburg, to support the SAR efforts in the Southern African Development Community (SADC).

12 of the 14 SADC States attended this training whose essential purpose was to facilitate closer collaboration between the SAR service providers throughout SADC. Some of the key elements covered during the 4-day training included civil aviation SAR regulations, certification requirements for SAR service providers as well as letters of agreement for co-operation between SADC States.

The generous contribution of the UAE GCAA to the SADC for Search and Rescue was successful in advancing more cost-effective SAR services and reducing the limitations related to State territories while paying due regard to matters of sovereignty. New and improved arrangements were agreed to, ensuring timely cross-border operations by strengthening regulatory structures, empowering operational entities and standardizing policies, practices and procedures.



### SAFE: Aviation Safety Fund

During the past decade, ICAO's aviation safety programme has experienced significant growth and refocusing.

With this in mind, ICAO has created a financial mechanism which would allow for the collection and use of voluntary contributions from States and other donors in a responsible, consistent, transparent, efficient and timely manner, while minimizing administrative costs. The Fund was aptly named the SAFE Fund.

Monies collected in the SAFE Fund are used for:

- Short term assistance to States with significant safety concerns without the means to develop and implement corrective action plan.
- Safety projects, consistent with the ICAO Strategic Objective on safety, but which cannot be fully funded through the ICAO regular programme budget.
- Contingency planning allowing ICAO to act immediately and effectively on urgent safety issues and in response to unforeseen events.

In order to mobilize resources for the replenishment of the SAFE Fund, ICAO has developed a strategy which seeks to solicit contributions from donor States, the private sector, as well as members of civil society.

In order to mobilize resources for the replenishment of the SAFE Fund, ICAO has developed a strategy which seeks to solicit contributions from donor States, the private sector, as well as members of civil society. A Project Review Committee (PRC) has been established for the SAFE as stipulated in the ICAO Policy on Voluntary funds. The PRC has the mandate to review project proposals and make recommendations for allocations of the SAFE funds. Members of the PRC are responsible for providing policy and guidance on the design of projects and for reviewing submitted projects. The PRC makes recommendations to the Secretary General on the allocation of funds to projects based on the validity of each proposal and its adherence to funding criteria.

To date 1,033,735 USD have been donated to the SAFE Fund by ABIS Group, China, Cameroon, Fiji, France, Italy, Mexico, Mauritius, Netherlands, Nigeria, Norway, Pakistan and the Republic of Korea. The Russian Federation has pledged an annual contribution of 119,364 USD and the United States have pledged 1,000,000 USD to provide assistance to South Sudan.



# Aerodrome Safety

The Air Navigation Commission has recently completed its final review of a comprehensive amendment to Annex 14, Volume I – Aerodrome Design and Operations, for review and adoption by the Council in early 2013. These amendments are aimed at enhancing aerodrome safety, in particular runway safety. These mainly include:

## **RESA and Arresting System**

The amendment strengthens the RESA requirement to cover small aerodromes (with code 1 and 2 non-instrument runways) and, more importantly, introduces arresting system as an alternative means to mitigate runway overrun risks, subject to acceptance by States. The amendment provides for safety enhancement with more flexible, performance-based measures.

## **Runway Surface Condition Assessment and Reporting**

The amendment (including consequential amendments to Annex 15 and PANS-ATM) aims to strengthen existing provisions concerning the assessment, measurement and reporting of runway surface contamination at aerodromes which represent a major runway excursion risk factor. The main objective is to report runway conditions by aerodrome operators in a standardized manner such that flight crews are able to accurately determine aircraft take-off and landing performance safely and efficiently.

## **Emergency response and Rescue and Fire Fighting**

The amendment deals with emergency response and rescue and firefighting at an aerodrome. On emergency response, a modular concept of testing emergency plans at an aerodrome would result in a longer interval for a full-scale exercise, providing increased flexibility to States and operators. This is particularly pertinent for those States and operators having difficulty in seeking collaboration with mutual aid agencies. On aerodrome rescue and firefighting, a new generation of performance level “C” foam for fighting aircraft fires has been introduced. The level “C” foam requires less water for foam production, a lesser discharge rate and is more efficient in its extinguishing ability than current generation of foams. On average, based on the quantities of water required, it is 52% and 20% more efficient than current performance level “A” and “B” foams. The use of the new foam should result in either a reduction in the size of new fire vehicles or an increase in firefighting capabilities when using existing vehicles.

## **Simple Touchdown Zone lights**

The amendment provides specifications for a lighting system that identifies the end of the touchdown zone for relatively short and high angle of approach runways where full touchdown zone lights are not installed. This would improve safety by increasing flight crew situational awareness as to their position in relation to the touchdown zone, helping to prevent runway excursions due to pilots landing too far down the runway.

## **Use of LED Technology for Visual Aids at Aerodromes**

The amendment provides for new specifications on colour boundaries for the colour “white” for the specific application of white LEDs for visual aids. This would improve safety by ensuring that white LEDs are perceived as white in regard to human performance issues of flight crews. This would also promote the use of LEDs which save aerodrome operators up to 80% in electrical power costs.



### Aviation Jet Fuel Quality

In April 2011, ICAO accepted a safety recommendation from the Civil Aviation Department of Hong Kong, China, arising from an accident investigation of the Cathay Pacific Airlines A330 accident in 2010, where fuel contamination caused aircraft damage and passenger injuries during an emergency evacuation. In order to address the emerging issue of aviation jet fuel quality, which may have an adverse impact on aviation safety, ICAO decided to work with the industry to develop provisions on the proper receipt, storage and distribution of aviation fuel at airports for commercial transport aircraft.

Working with IATA, A4A and ACI to collaboratively address the emerging issue, ICAO has recently developed and posted on the ICAO-NET a Manual on Civil Aviation Jet Fuel Supply (Doc 9977). The aim of the manual is to inform the aviation and petroleum industries globally about the existence of internationally accepted petroleum and aviation industry fuel practices and to reinforce the need for compliance with them. The manual acts as a “signpost” document, summarizing and directing readers to relevant industry policies, standards and procedures (PSPs) that cover all matters related to aviation fuel quality control, operations and training across the entire supply and distribution system, from refinery to aircraft refuelling. A State letter (AN 4/26-12/28) has been sent out announcing the ICAO manual and seeking information from States that would assist ICAO in further work on fuel quality issues.



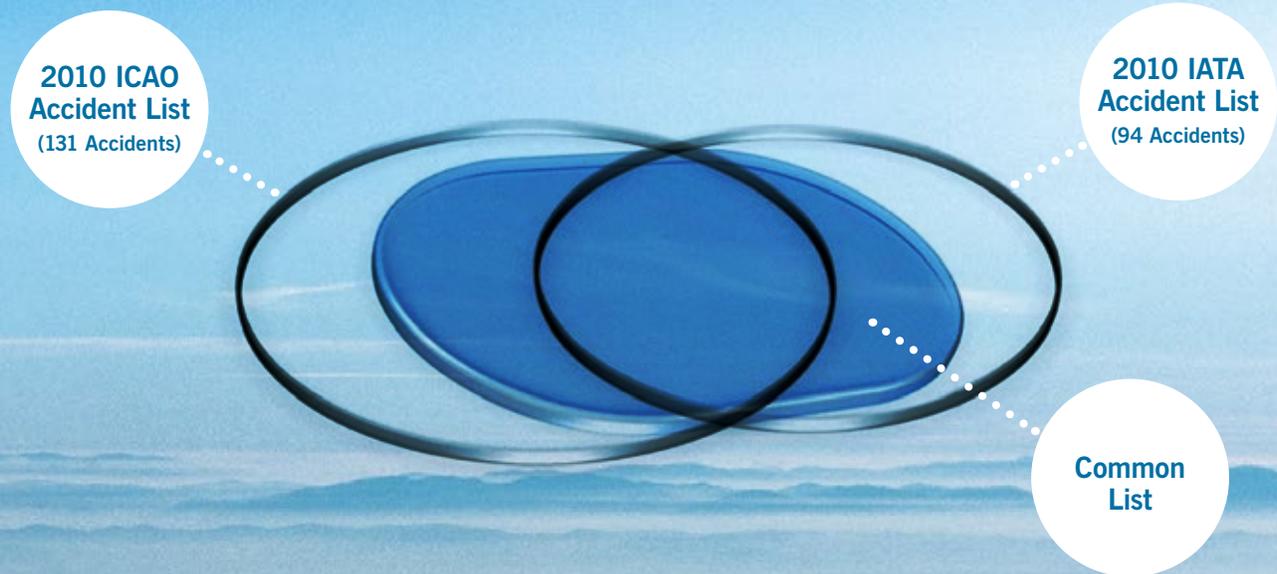


# Creating a Global Safety Information Exchange

In the spirit of promoting aviation safety, the Department of Transportation of the United States, the Commission of the European Union, the International Air Transport Association (IATA) and ICAO signed a Memorandum of Understanding (MoU) on a Global Safety Information Exchange (GSIE) on 28 September 2010 during the 37th Session of the ICAO Assembly. The objective of the GSIE is to identify information that can be exchanged between the parties to enhance risk reduction activities in the area of aviation safety.

The MoU calls for the establishment of a Steering Group which is responsible for the development and the effective functioning of the GSIE. Led by ICAO, the Steering Group has held four meetings intended to coordinate the collection, analysis and exchange of aviation safety information among the members of the GSIE as well as to disseminate pertinent information to the global aviation community.

The GSIE has attained a number of achievements instrumental in the identification of mechanisms necessary to effectively share relevant information. Through these mechanisms, the GSIE Steering Group envisages to develop a harmonized method to assess implementation of international requirements and conformance with industry best practices across key sectors of the aviation system. An important achievement derived from this initiative is the agreement reached by ICAO and IATA on a harmonized accident rate for 2011. This was accomplished through close co-operation between ICAO and IATA with respect to accident definitions, criteria and analysis. ICAO and IATA have developed, and subsequently presented to the GSIE, a set of harmonized safety criteria that were developed for the sole purpose of establishing a common, global accident rate for GSIE members that would be considered a fair representation of the accident rate for commercial aviation worldwide.



Through this collaborative effort, and using the new harmonized criteria, the first published GSIE harmonized accident rate for 2011 is **3.6 accidents per million departures**

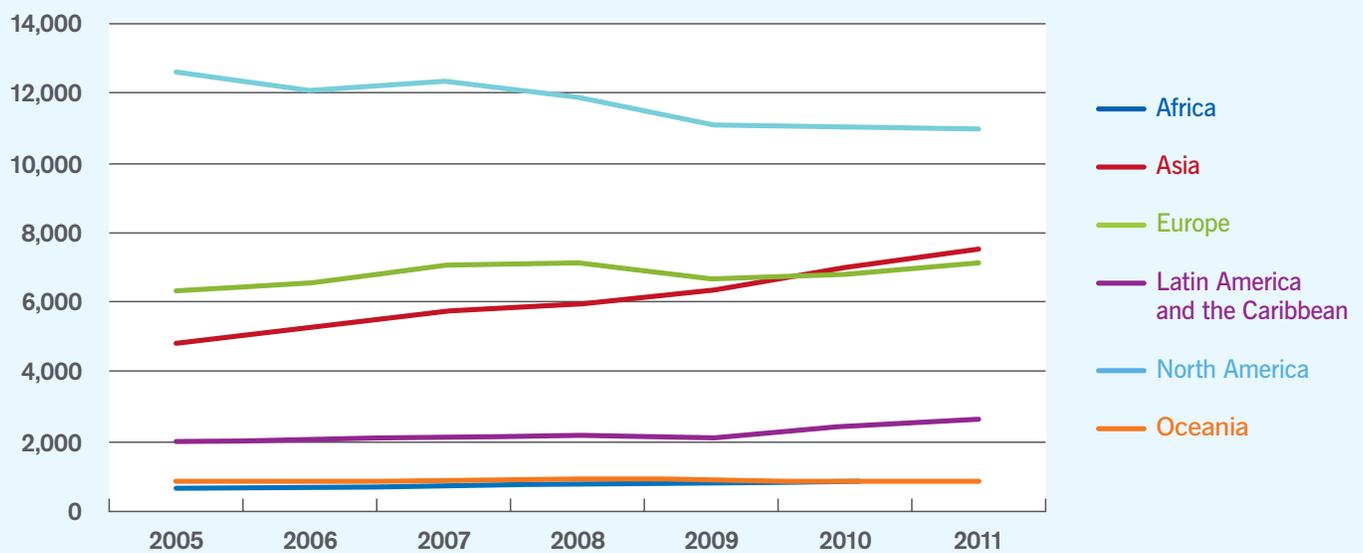


## Appendix 1: Traffic Overview

### Commercial Air Transport Summary

The following chart and table show scheduled commercial flight departures for the years 2005 to 2011.

#### Scheduled Commercial Flight Departures: 2005 to 2011



UN Region	2005	2006	2007	2008	2009	2010	2011	Change 2011 vs. 2010
North America	12,614	12,074	12,354	11,898	11,076	11,008	10,979	-0.3%
Asia	4,790	5,281	5,745	5,974	6,340	7,011	7,561	+7.8%
Europe	6,338	6,545	7,070	7,138	6,659	6,831	7,143	+4.6%
Latin America and the Caribbean	2,003	2,039	2,129	2,167	2,144	2,424	2,625	+8.3%
Oceania	880	889	891	894	848	869	855	-1.6%
Africa	653	654	722	789	802	880	891	+1.3%
<b>Grand Total</b>	<b>27,278</b>	<b>27,482</b>	<b>28,911</b>	<b>28,859</b>	<b>27,870</b>	<b>29,023</b>	<b>30,053</b>	<b>+3.5%</b>



As the above chart clearly reveals, the region with the most departures over the past seven years is North America. Traffic volume in this region has been trending lower however, with a marginal year-over-year decrease experienced from 2010 to 2011 as well as an average 2.7% annual decrease over the seven-year period.

Asia's average annual traffic increase of 7.8% during this timeframe was the largest percentage growth rate experienced by all regions. As a result, Asia's total traffic volume in 2011 ranked second to North America.

While Europe experienced a 4.6% year-over-year increase in 2011, the region's average annual growth rate during the 2005–2011 period was 1.5%. Accordingly, in 2011 European traffic volume ranked third, behind the North America and Asia regions.

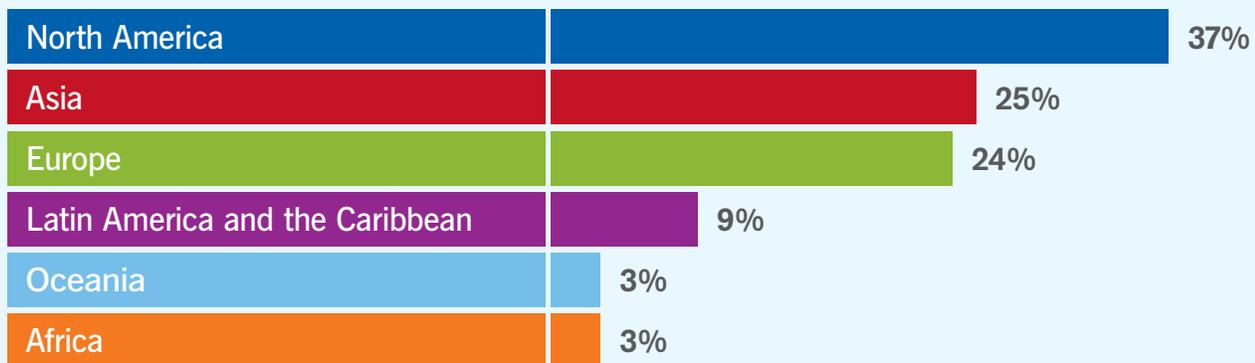
Traffic in the Latin America and Caribbean region has increased steadily throughout the seven year period, experiencing an average annual growth rate of 3.9% as well as an 8.3% year-over-year increase in 2011.

Oceania's traffic has remained stable since 2005 (0.3% yearly decrease).

Africa continues to have the lowest number of departures but is experiencing steadily increasing traffic volume, with an average annual increase of 6.2% within the region.

The chart below depicts the worldwide distribution of 2011 regional scheduled commercial traffic. As can be observed, North America includes one third of global traffic while both Asia and Europe each comprise about one quarter of global traffic. Latin America and the Caribbean accounts for 9%, while Oceania and Africa each represent approximately 3% of global traffic.

### Worldwide Distribution of Regional Scheduled Commercial Traffic: 2011





## Appendix 2:

# Analysis of Accidents–Scheduled Commercial Air Transport

This section provides a detailed analysis of accidents during 2011 as well as a review of accidents over the past seven years.

The data used in the analyses are for aircraft providing scheduled commercial air transport having a maximum take-off weight exceeding 2250 kg.

## High-Risk Accident Occurrence Categories

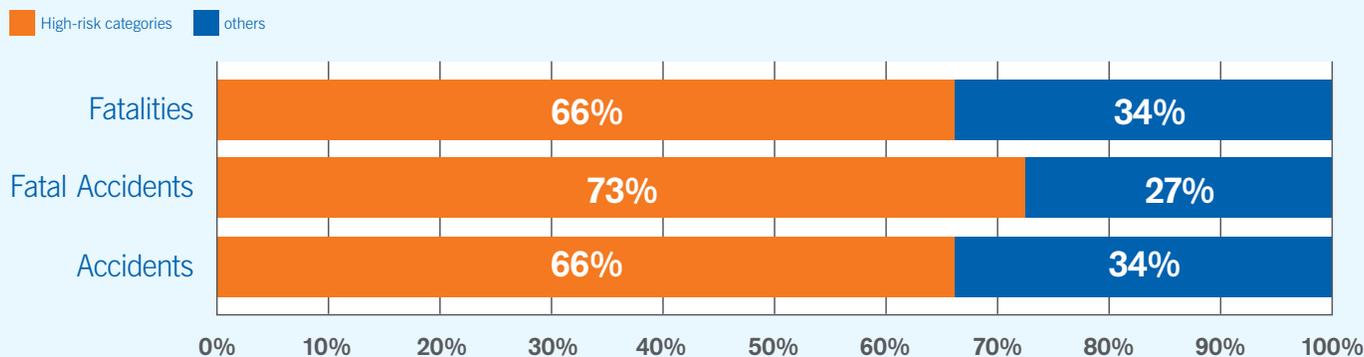
Based on an analysis of accident data covering the 2005–2010 time period, ICAO has identified three high-risk accident occurrence categories:

- runway safety related events<sup>3</sup>
- loss of control in-flight
- controlled flight into terrain

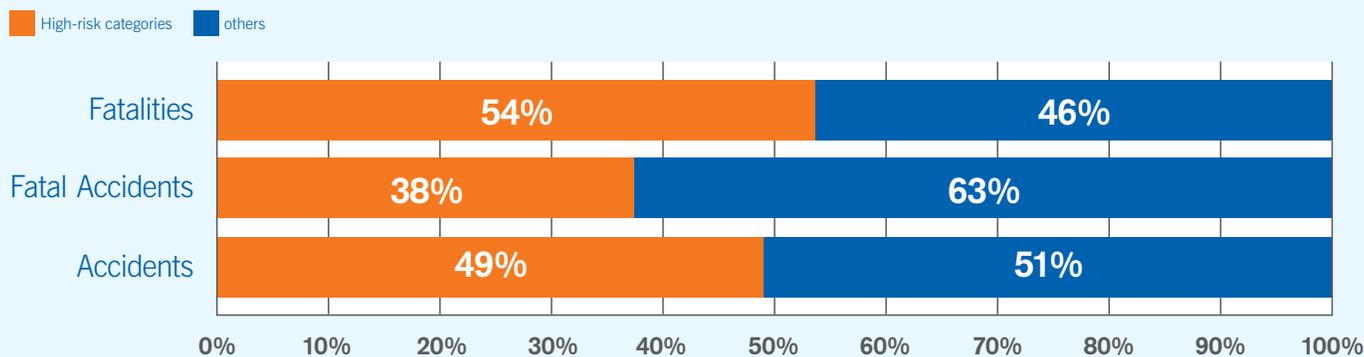
As indicated in the first chart below, these 3 categories represent 66% of the total number of accidents, 73% of fatal accidents and 66% of all fatalities.

The second chart shows the number of accidents on the above categories for 2011. In 2011, there have been less high risk accidents and fatalities in the preceding six-year benchmark period.

### Distribution of High-risk Accidents: 2005–2010



### Distribution of High-risk Accidents: 2011



<sup>3</sup> Runway safety related events include the following ICAO accident occurrence categories: Abnormal Runway Contact, Bird strike, Ground Collision, Ground Handling, Runway Excursion, Runway Incursion, Loss of Control on Ground, Collision with obstacle(s), Undershoot / Overshoot, Aerodrome



## Appendix 2: Analysis of Accidents – Scheduled Commercial Air transport

The following chart provides a summary of the distribution of accidents, fatal accidents and of fatalities related to the 3 high-risk occurrence categories from 2005–2010.

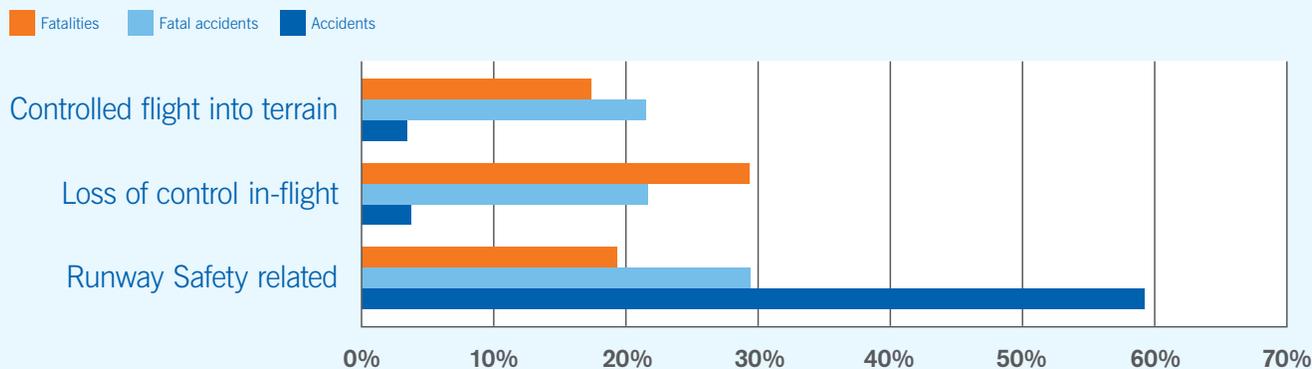
Runway safety accidents represented 59% of all accidents, accounting for 29% of all fatal accidents and 19% of all related fatalities reported between 2005 and 2010.

While the loss of control in-flight occurrence category represented only 4% of all accidents, this category is of significant concern as it accounts for 22% of all fatal accidents and 29% of all fatalities.

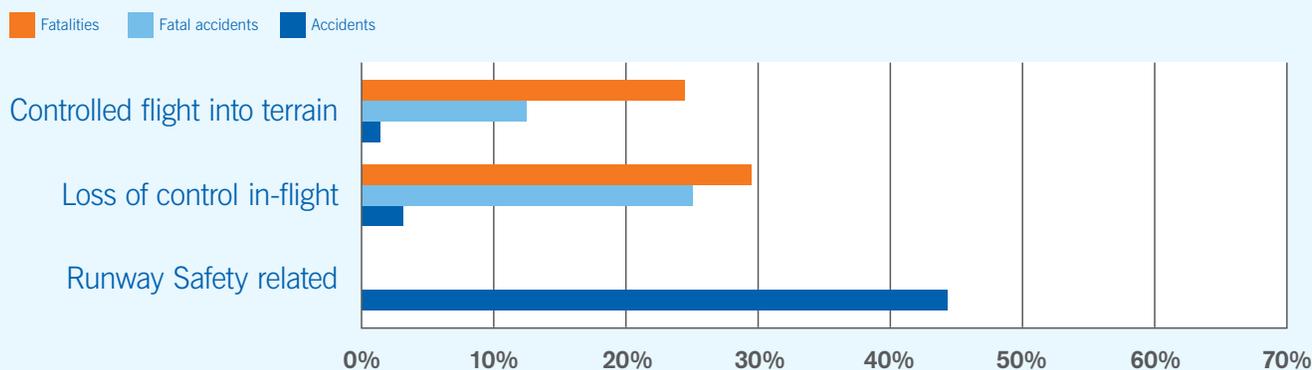
Similarly, accidents related to controlled flight into terrain accounted for only 3% of all accidents but represented 22% of all fatal accidents and 17% of fatalities.

The 2011 accidents follow broadly the same distribution as the benchmark period except for runway safety related accidents. In 2011, the total number of runway safety related accidents dropped significantly and no fatal accidents were attributed to that risk.

### Percentage of All Accidents: 2005–2010



### Percentage of All Accidents: 2011

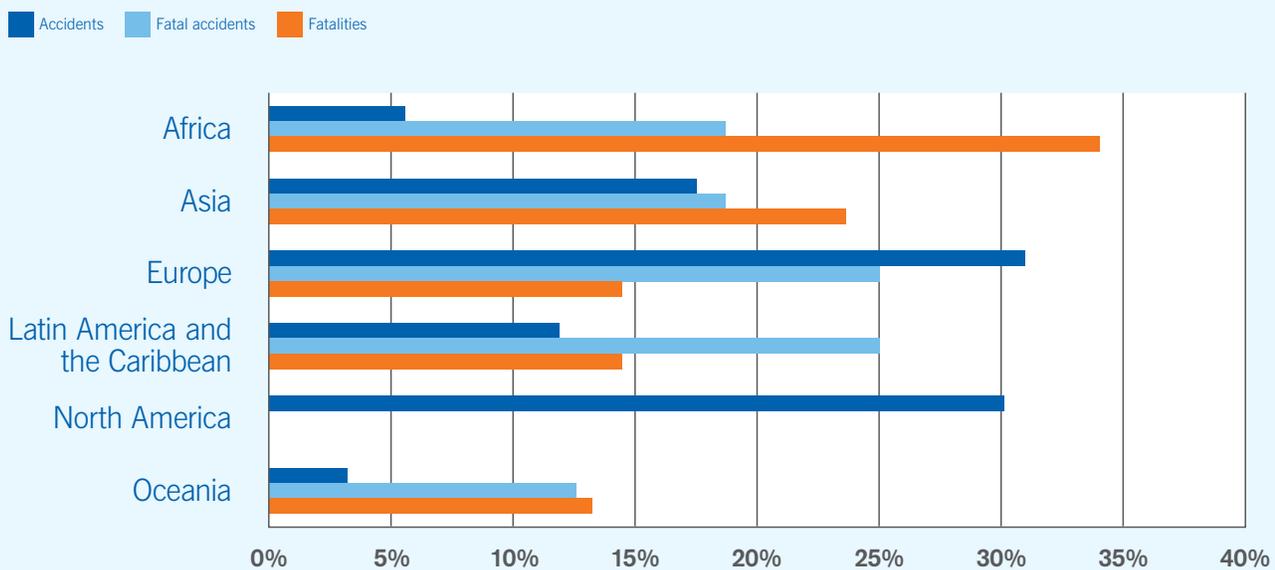




## 2011 Accidents by UN Region

The chart and the table below indicate the percentage of accidents and related fatalities attributable to the region in which they occurred.

### Accidents by Region of Occurrence: 2011



2011	Africa	Asia	Europe	Latin America and the Caribbean	North America	Oceania	Total
Accidents	7	22	39	15	38	4	126
Fatal Accidents	3	3	4	4	0	2	16
Fatalities	141	98	60	60	0	55	414

Note: one accident occurred in international waters and is not associated with any region.

The regional distribution of fatal accidents is relatively consistent, ranging between 13% and 25% across five UN regions, with North America being the notable exception having experienced no fatal accidents in 2011.

Africa accounted for only 6% of all accidents and for almost one third of all fatalities.

Asia, the region with the highest annual traffic growth rate during the 2005–2011 period, accounted for 27% of all accidents, 18% of all fatal accidents and 24% of all fatalities.

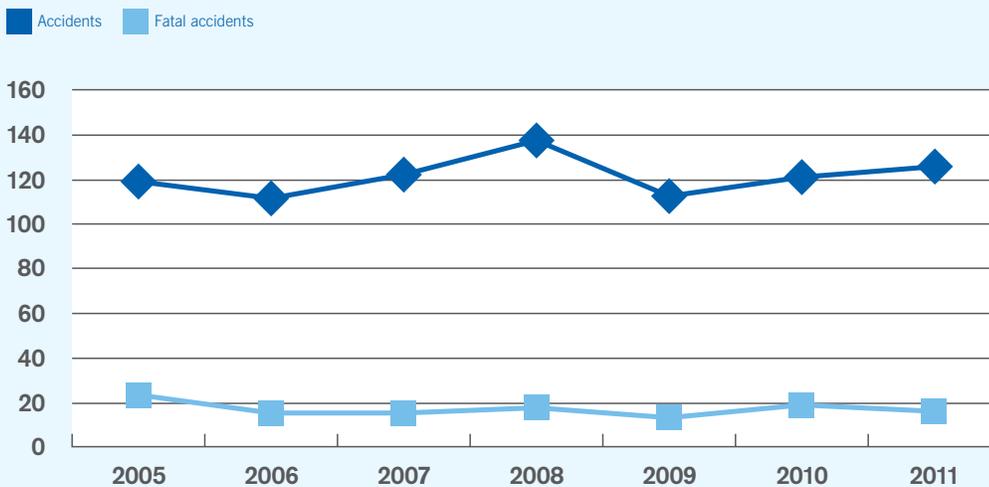
Europe had only the third highest traffic volume and accounted for 31% of all accidents in 2011.



## 2005–2011 Accident Trends

The chart below shows the number of total and fatal accidents on commercial scheduled flights during the 2005–2011 period.

### Accident Trends: 2005–2011



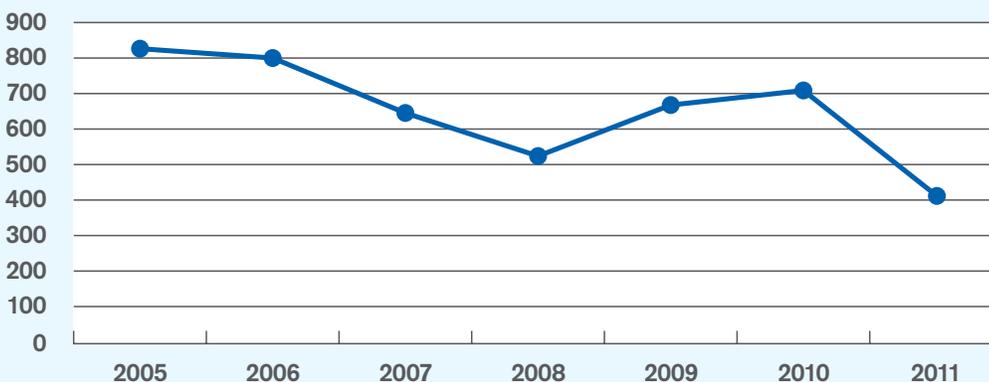
The number of accidents experienced annually has been more or less stable since 2005 at approximately 120 events per year, resulting in an equivalently stable accident rate of approximately 4 accidents per million departures.

2011 experienced a 4.1% year-over-year increase in the total number of accidents in scheduled commercial air

transport compared to 2010, while traffic increased by 3.5% during the same period. As a result, the 2011 accident rate remained at 4.2 accidents per million departures.

The chart below shows the number of fatalities for the above mentioned fatal accidents.

### Fatality Trends: 2005–2011





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