ICAO

State of Global Aviation Safety

Evolving Toward a Risk-based Aviation Safety Strategy

The safety of the global air transport system is the International Civil Aviation Organization's (ICAO's) guiding and most fundamental Strategic Objective.

ICAO constantly strives to improve aviation safety outcomes through the following coordinated activities:

- **Monitoring** of key safety trends and indicators.
- **Safety Analysis**.
- **Policy and Standardization** initiatives.
- **Implementation** of programmes to address safety issues.

This second print edition of the ICAO *State of Global Aviation Safety* is intended to provide Member States, aviation stakeholders and the travelling public with a comprehensive overview of ICAO's contributions through its leadership in affecting aviation safety outcomes worldwide.

This unique approach is achieved by identifying and monitoring global aviation safety metrics that form the basis for practical risk analysis and provide context for the Organization's actions and programmes aimed at improving global air transport safety performance.

This publication is presented to both review the accomplishments and initiatives that continue to drive aviation safety improvements, as well as to motivate and inspire air transport stakeholders to participate in the innovative and practical suite of programmes being implemented to improve all aspects of safety performance.

Disclaimer

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Note:

The United Nations' taxonomy of world regions and RASG areas are used in this report and is described in the appendices. This document focuses primarily on scheduled commercial flights, the data for which is based on the Official Airline Guide (OAG) combined with internal ICAO preliminary estimates.

Contents

Executive Summary

Over the last triennium, traffic volumes have experienced continuous and sustained growth. In 2012, approximately 31.2 million departures were performed by scheduled commercial operators, representing an increase of 3.5 per cent over the three-year period.

FIGURE 1: Worldwide Traffic Volume (millions of departures)

Year	Departures
2008	28.9
2009	27.9
2010	29.0
2011	30.1
2012	31.2

The air transport system carried approximately 2.9 billion passengers in 2012, representing a 5.5 per cent increase in scheduled commercial revenue passenger-kilometers (RPKs) over the previous year.

In addition, today's expanding aviation system comprises multiple and interrelated systems that are geopolitically diverse, technologically complex and highly multidisciplinary. In light of the complexity and anticipated sustained expansion of the industry, continued efforts to improve safety are essential.

ICAO is committed to developing proactive and risk-based solutions to reduce the global accident rate and the Organization calls on the aviation community to recognize the importance of adhering to a globally harmonized approach to improving and monitoring safety.

Compared to 2011, the number of accidents[1] in 2012 decreased by 21 per cent and the number of fatalities decreased by 10 per cent making 2012 the safest year with regard to fatalities since 2004.

Due to the reduction in accidents, combined with the increase in departures, the global accident rate involving scheduled commercial operations for 2012 has decreased significantly to 3.2 accidents per million departures.

[1] As defined in ICAO Annex 13

Accident Rates

FIGURE 2: Global Accident Rate (accidents per million departures)

Year	Rate
2008	4.8
2009	4.1
2010	4.2
2011	4.2
2012	3.2

Proactive Monitoring and Improving Safety

ICAO's Universal Safety Oversight Audit Programme (USOAP) provides in-depth information about a State's level of effective implementation of ICAO Standards and Recommended Practices (SARPs). This information is relied upon for high-level planning purposes within the Organization as it has been shown to be a leading safety indicator. Results in 2012 indicate that 55 per cent of audited states are at or above the global Effective Implementation average of 61 per cent.

ICAO recognizes the value of cooperation and the need to coordinate the different roles of States, ANSPs, airports, industry, international and regional aviation safety organizations that continually work together to implement safety policies, oversight activities, State safety programmes and safety management systems. 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, Fatigue Risk Management Systems and Safety Collaborative Assistance Networks (SCAN) are only a few examples of how ICAO is working with stakeholders to identify, manage and eliminate hazards.

The Organization is committed to improving aviation safety and enabling seamless cooperation and communication between stakeholders. ICAO continues to collaborate with established regional organizations, such as regional aviation safety groups (RASGs) and regional safety oversight organizations (RSOOs), and to promote the training and support necessary to address emerging safety issues.

Runway Safety Programme – A success story

Historical observations have shown that accidents are normally the result of contributing factors across multiple aspects of the aviation system. ICAO initiatives such as the Runway Safety Programme are therefore taking a multidisciplinary approach, requiring collaboration among regulatory authorities as well as stakeholders in air traffic management, airport operations, flight operations as well as the design and manufacturing sector. As part of the Runway Safety Programme, regional seminars have been delivered in all ICAO regions to promote and support the establishment of multidisciplinary runway safety teams (RSTs). Through the implementation of safety management practices, RSTs

FIGURE 3: Runway Safety Related Accidents and Fatalities
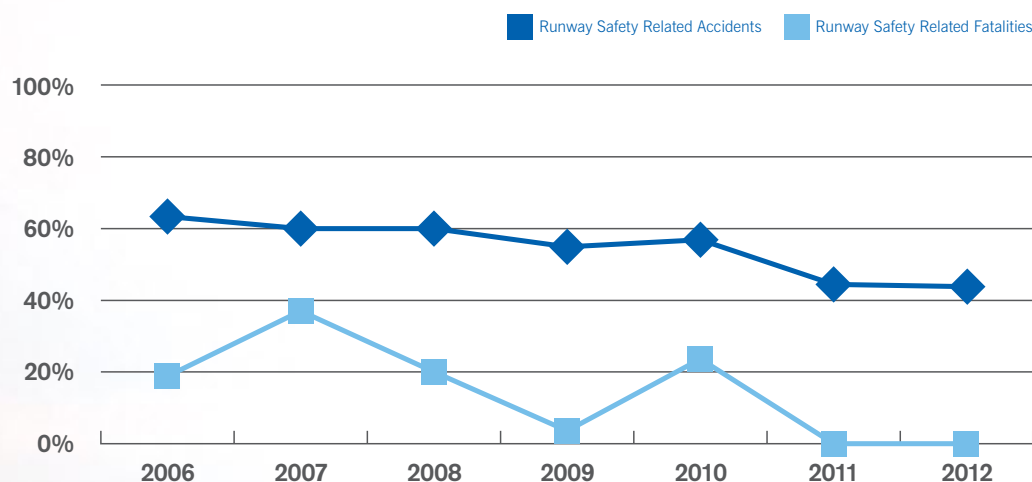
Legend: ■ Runway Safety Related Accidents ■ Runway Safety Related Fatalities

share best practices and other innovative approaches to continuously reduce risks encountered in the critical takeoff and landing flight phases. The statistics from 2012 indicate that the aviation community's response has been effective as there has been a marked decline in the percentage of runway safety related accidents and associated fatalities, with accidents falling from nearly 60% in the 2006 to 2011 benchmark period to 48% in 2012 and fatalities, falling from an average of 18% in the same benchmark period to 1% in 2012.

Runway Safety Programme Partners

2010–2012 Aviation Traffic Growth

The global air transport industry has experience sustained growth over the last triennium.[2]

TABLE 1: Departures by UN Region: 2010 vs. 2012

UN Region	Number of 2010 departures	Number of 2012 departures
North America	10,624,134	10,771,799
Asia	7,629,403	8,472,960
Europe	7,263,218	6,986,672
Latin America and the Caribbean	2,976,575	2,971,311
Oceania	1,048,396	1,030,631
Africa	1,014,787	944,168
World	30,556,513	31,177,541

When comparing the volume of traffic by UN region from 2010 to 2012, two facts become evident. Firstly, despite continued economic pressures, global air traffic has continued to grow and secondly, that regional growth rates vary with Asia continuing to be the second-highest region in terms of traffic volume after experiencing strong annual growth over the three year period.

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[2] Traffic statistics are for performed scheduled commercial operations.

Policy and Standardization

With air traffic projected to double in the next 15 years, current and emerging safety risks must be addressed proactively to ensure that this significant capacity expansion is carefully managed and supported through strategic regulatory and infrastructure developments.

It is therefore imperative that States and regions remain focused on establishing, updating and addressing their safety priorities as they continue to encourage expansion of their air transport sectors.

To ensure that continuous safety improvement and harmonized global air navigation modernization advance hand-in-hand, global, regional and State aviation safety planning is essential.

ICAO's Global Plans define the means and targets by which ICAO, States and aviation stakeholders can anticipate and efficiently manage air traffic growth while proactively maintaining or increasing safety.

The policies, procedures and systems that allow civil aviation to realize this mandate while remaining safe, secure, efficient and environmentally sustainable are prescribed within ICAO's coordinated international Standards and Recommended Practices (SARPs).

The Organization has many ongoing projects addressing a wide range of safety issues, many of which have been detailed under the Implementation section beginning on page 22.

All of these activities are harmonized by the principles and objectives outlined in ICAO's **Global Aviation Safety Plan** (GASP) as well as the new Annex 19 on **Safety Management**.

TO ENSURE THAT CONTINUOUS SAFETY IMPROVEMENT AND HARMONIZED GLOBAL AIR NAVIGATION MODERNIZATION ADVANCE HAND-IN-HAND, GLOBAL, REGIONAL AND STATE AVIATION SAFETY PLANNING IS ESSENTIAL.

Support through Strategic Leadership:
ICAO's Global Aviation Safety Plan (GASP)

Recognizing the importance of a global framework to support ICAO's Strategic Objectives for the safety and sustainability of the air transportation system, the Organization developed and began to implement its strategic Global Aviation Safety Plan (GASP) in 1997. The 37th Session of the Assembly confirmed the Organization's intent to continue to apply the GASP as a strategic tool for safety enhancement, focusing action where it is most needed.

The changes that the GASP has undergone were driven mainly by its strengthened role as a high-level policy, planning and implementation document guiding complementary and sector-wide air transport progress in conjunction with the ICAO Global Air Navigation Plan (GANP). In July of 2013, the ICAO Council approved the first edition of the revised Global Aviation Safety Plan and submitted the document for endorsement by the 38th Session of the Assembly.

The GASP specifically establishes targeted safety objectives and initiatives while ensuring the efficient and effective coordination of complementary safety activities between all stakeholders. In this latest iteration of the GASP, the objectives and related initiatives have evolved to reflect progress in the implementation of proactive safety management practices for Member States and industry. They are furthermore aligned with ICAO's strategic planning processes.

A key priority of the GASP is to continually reduce the global accident rate through a structured and progressive approach comprising near-, mid- and long-term objectives. In addition, the GASP objectives are supported through specific safety initiatives that are categorized according to distinct Safety Performance Enablers.

The Plan recognizes that States and regions face varying safety challenges and provides a means for establishment of priorities within the global framework. In this way, the initiatives included in the GASP will serve to deliver tailored progress within the framework of each Member State's safety oversight capabilities, their safety management culture as well as with the implementation of a safety structure necessary to support the air navigation systems of the future.

The high-level GASP objectives involve the continuous enhancement of safety and quality in aviation operations. This is achieved through the promotion of collaborative approaches including increased sharing of safety information as well as the prioritization of necessary investments in the people, technologies and assistance projects required to improve safety worldwide. The GASP will continue to focus on improvements in regions experiencing significant traffic growth, or continuing to encounter specific safety challenges.

Safety Management

In February of 2013 the ICAO Council adopted a new Annex to the Convention on International Civil Aviation. Annex 19 – *Safety Management*, with an applicability date of November 2013, is the first Annex to be adopted in over 30 years. The new Annex comprises Standards and Recommended Practices (SARPs) related to the implementation of State safety programmes (SSP) and safety management systems (SMS), including provisions for the collection, analysis, protection and exchange of safety information. These requirements are essential to the successful evolution of a proactive safety strategy.

The development of Annex 19 was based on recommendations of the 2010 ICAO High-level Safety Conference (HLSC) which concluded that overarching provisions related to State safety management responsibilities should be contained in a single Annex. As a result, the First Edition of Annex 19 consolidates safety management provisions initially adopted in Annex 1 — *Personnel Licensing*, Annex 6 — *Operation of Aircraft*, Annex 8 — *Airworthiness of Aircraft*, Annex 11 — *Air Traffic Services*, Annex 13 — *Aircraft Accident and Incident Investigation* and Annex 14 — *Aerodromes*. Safety management requirements specific to a single area of aviation activity have been retained in their respective Annexes. Annex 19 also broadens the scope of State safety oversight responsibilities, to become applicable to all types of aviation service providers.

ICAO worked in close cooperation with Member States and international organizations throughout the Annex 19 development process. The Safety Management Panel (SMP), established by the Air Navigation Commission in June 2011, provided recommendations for the new Annex. The SMP's recommendations subsequently underwent a rigorous review and approval process. Through the collaborative efforts of all stakeholders, Annex 19 was adopted by the Council less than two years after the SMP was established.

To support the new Annex, ICAO has also published a revised *Safety Management Manual* (Doc 9859), containing updated guidance material related to the elements of the SSP and SMS framework ICAO will continue to update Annex 19, based on the feedback and experience gained by Member States and industry stakeholders. More information regarding Annex 19 can be found on the ICAO safety management public website (www.icao.int/safety/safetymanagement).

ICAO is in the process of producing a Standardized Training Package (STP) as part of its obligation to communicate and support the implementation of safety management Standards and Recommended Practices (SARPs). This STP will primarily target State regulatory and administrative personnel involved in the implementation and operation of State safety programmes (SSP). It will also provide guidance to service providers to support the implementation and operation of safety management systems (SMS). This training package is based on Annex 19 and the SMM 3rd Edition, and is targeted for evaluation in early 2014.

The STP will consist of a blended learning approach, combining computer-based training (CBT, or e learning) with an optional module for group exercises involving certain safety management tools. The CBT portion will provide participants with a homogeneous level of knowledge on safety management, while the exercises will reinforce the concepts that they can then apply to implement safety management provisions.

Safety Monitoring

ICAO's Universal Safety Oversight Audit Programme

The ICAO Universal Safety Oversight Audit Programme (USOAP) has unquestionably contributed to improving the safety of international civil aviation in all regions of the world.

At the heart of the programme's success lies the fundamental process of identifying deficiencies through the safety oversight audits, encouraging States to develop and implement plans to correct the deficiencies, and to create a guide for future improvements.

As of 2012, ICAO had completed 183 comprehensive systems approach (CSA) audits, accounting for 96 per cent of all Member States having oversight responsibility for 99 per cent of all international air traffic. The remaining States have not been audited, mainly due to United Nations security related travel restrictions.

Recognizing that standardization is a fundamental tenet of a safe air transport system, ICAO continues to increase the efficiency and transparency of all aspects of its audit process.

The State Aviation Activity Questionnaire (SAAQ), the Compliance Checklists, and the USOAP Audit Manager application

are tools developed to enable ICAO to perform the detailed reviews of States safety oversight systems for civil aviation.

Transparency and the sharing of information associated with the evolution of the audit programme have likewise contributed to improving safety. The unobstructed availability of timely, unbiased and authoritative safety information is essential for sound decision-making and cost-effective investments of human and financial resources.

These USOAP audit results complement information already available and enhance our knowledge and understanding of the specific areas where we should focus our efforts.

Global Effective Implementation by Technical Area

USOAP results were obtained for each of the eight technical areas. The global average results for each area are shown in figure 4.

FIGURE 4: Global Audit Results: Effective Implementation of Safety Oversight by Technical Area

Technical Area	Percentage
Primary aviation legislation and civil aviation	70%
Civil aviation organization	63%
Personnel licensing and training	71%
Aircraft operations	66%
Airworthiness of aircraft	73%
Aircraft accident and incident investigation	51%
Air navigation services	53%
Aerodromes	58%

Regional Results and Safety Indicators

Effective State safety oversight capabilities as measured by USOAP provide a proactive indicator of safety performance. This shows which regions have high variability in terms of level of effective implementation.

Figure 5 provides an overview of effective implementation of USOAP Critical Elements (CEs) per United Nations region as of 2012. As illustrated, four regions have aggregate effective implementation scores above the global average of 60 per cent, with two regions (Africa and Oceania) below the global average. In addition, the length of each vertical line depicts the range of effective implementation among States within each region, indicating a wide variance within five of the six United Nations regions. This shows which regions have high variability in terms of level of effective implementation.

FIGURE 5: USOAP Effective Implementation Level by United Nations Region
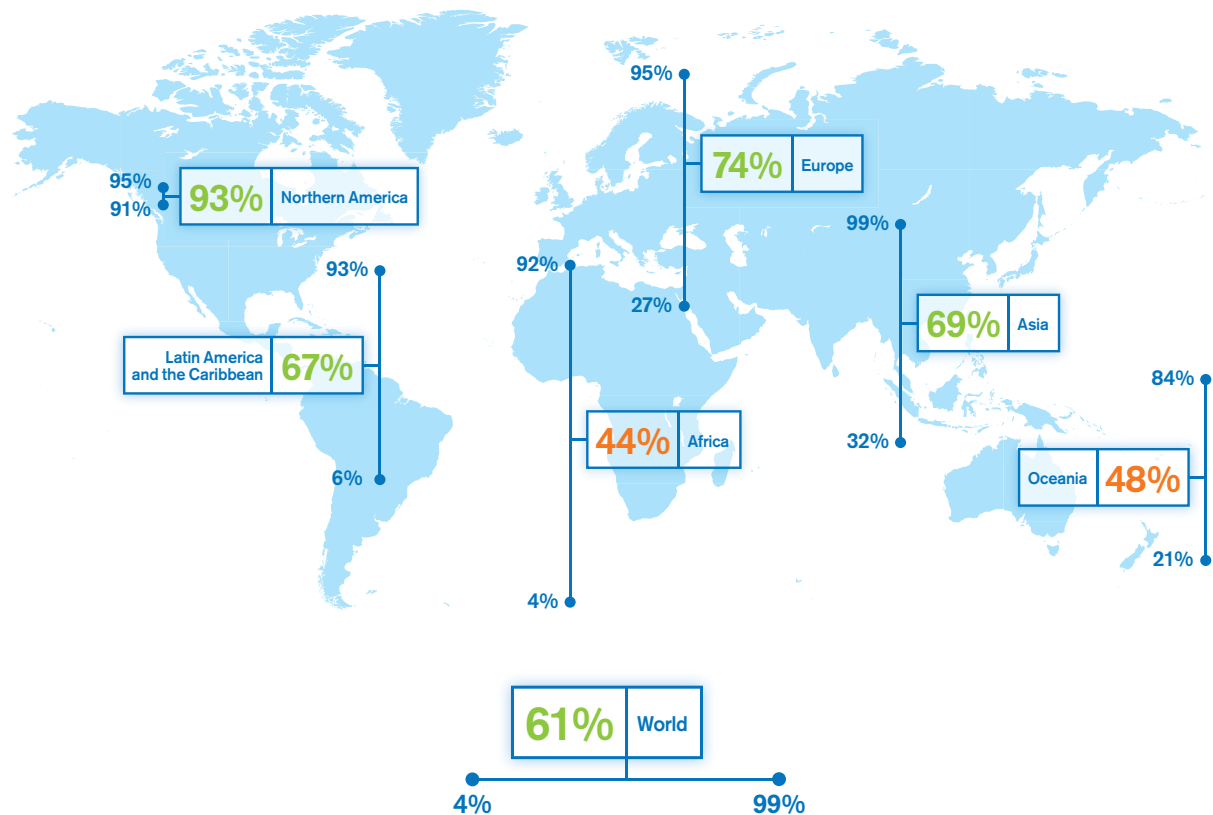
USOAP State Performance

States, listed in alphabetical order, having Effective Implementation **above** the global average of 61 per cent.

Argentina

Armenia

Australia

Austria

Belgium

Belize

Bolivia
(Plurinational State of)

Bosnia and Herzegovina

Brazil

Brunei Darussalam

Bulgaria

Canada

Cape Verde

Chile

China

Colombia

Costa Rica

Croatia

Cuba

Cyprus

Czech Republic

Democratic People's Republic of Korea

Denmark

Dominican Republic

Ecuador

Egypt

El Salvador

Estonia

Ethiopia

Fiji

Finland

France

Gambia

Germany

Ghana

Greece

Guatemala

Honduras

Hungary

India

Indonesia

Iran
(Islamic Republic of)

Ireland

Israel

Italy

Japan

Jordan

Kenya

Kuwait

Kyrgyzstan

Lao People's Democratic Republic

Latvia

Lithuania

Luxembourg

Malaysia

Malta

Mauritania

Mexico

Mongolia

Montenegro

Morocco

Netherlands

New Zealand

Nicaragua

Nigeria

Norway

Pakistan

Panama

Peru

Philippines

Poland

Portugal

Republic of Korea

Romania

Russian Federation

Saudi Arabia

Serbia

Singapore

Slovakia

Slovenia

South Africa

Spain

Sri Lanka

Sudan

Sweden

Switzerland

Thailand

Togo

Trinidad and Tobago

Tunisia

Turkey

Turkmenistan

Ukraine

United Arab Emirates

United Kingdom of Great Britain and Northern Ireland

United States of America

Uzbekistan

Venezuela
(Bolivarian Republic of)

Zimbabwe

Safety Analysis

The purpose of this chapter is to present the results and conclusions of the safety analysis performed at ICAO. In addition, this section highlights recently developed tools and analytical capabilities available at ICAO that will assist the Organization to better understand and manage factors affecting aviation safety.

As these analytical tools mature, information derived from them will provide the basis for safety intelligence and will serve to refine ICAO's safety strategy and guide the allocation of resources to effectively address specific safety risks.

Global Accident Rates

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

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

Figure 6 shows the change in the accident rate over the previous five years, with 2012 having an accident rate of 3.2 accidents per million departures, the lowest recorded since ICAO began tracking the global accident rate.

FIGURE 6: Global Accident Rate (accidents per million departures)

Year	Rate
2008	4.8
2009	4.1
2010	4.2
2011	4.2
2012	3.2
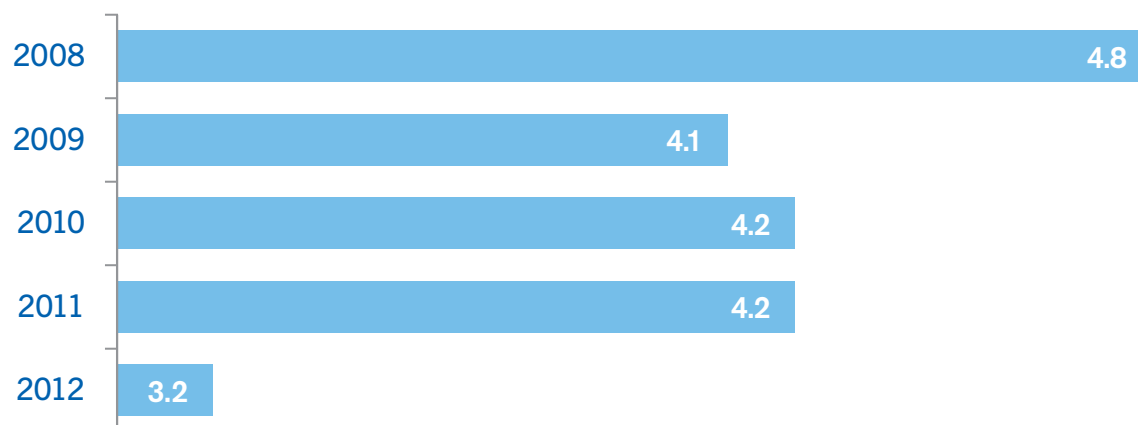
Regional Accident Statistics

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 provide a more complete picture of the scope and nature of regional safety outcomes

To further analyse the state of aviation safety, the accident data for scheduled commercial air transport is categorized according to United Nations regions, based on the State of occurrence for each accident.

Table 2 provides insight into the state of aviation safety in different regions in the context of global outcomes. It should be noted that for the second consecutive year, none of the regional accident rates were greater than twice the global rate.

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

The Asian region has an accident rate below the global rate. Approximately 13 per cent of the accidents in this region resulted in fatalities.

While the accident rate for the geographic European region is marginally above the global accident rate, 3 accidents resulted in fatalities.

While the Latin American and Caribbean accident rate is higher than average, the relatively small percentage of traffic in the region leads to volatility in the accident rate.

TABLE 2: Accident Statistics and Accident Rates: 2012

UN Region	Traffic (thousands)	Accidents		Fatal Accidents
		Number	Rate[3]	
Africa	944	5	5.3	2
Asia	8,473	23	2.7	3
Europe	6,987	30	4.3	3
Latin America and the Caribbean	2,971	12	4.0	1
Northern America	10,772	29	2.7	0
Oceania	1,031	0	0	0
World	31,178	99	3.2	9

[3] The accident rate is defined by the number of accidents per million departures

Despite having the highest number of accidents, the Northern America region has an accident rate below the world average. Northern America experienced no fatal accidents for the year 2012.

The Oceanic region did not experience any accidents in scheduled commercial air transport for the year 2012.

Table 3 reflects the percentage of accidents in the context of overall traffic share per region.

ICAO's Safety Intelligence initiative provides additional insights to complement these high-level indicators.

Safety Intelligence

In 2010, ICAO initiated a risk-assessment process to enhance aviation safety. This concept has evolved to Safety Intelligence, which provides actionable information used to drive ICAO's safety strategy and programmes.

The Organization accomplished its objectives in this regard through identification and analysis of multiple data sources including:

- Accident statistics,
- USOAP audit results,
- Economic indicators,
- Fleet composition and age,
- Weather,
- Infrastructure,
- Traffic volume and traffic growth,
- Traffic distribution factors including the proportion of domestic traffic vs. international flights flown by a State's AOC holders vs. foreign operators

Safety Intelligence enables the Organization to create a holistic understanding of safety issues by consolidating and benchmarking a number of safety performance indicators and providing guidance used to develop assistance for Member States, regional and sub-regional organizations.

TABLE 3: Accidents and Traffic Distribution: 2012

UN Region	Percentages	
	Traffic	Accidents
Africa	3%	5%
Asia	27%	18%
Europe	22%	24%
Latin America and the Caribbean	10%	9%
Northern America	35%	23%
Oceania	3%	0%

Regional Safety

Regional Aviation Safety Groups (RASGs)

In line with the ICAO Global Aviation Safety Plan, ICAO Regional Aviation Safety Groups (RASGs) serve to ensure effective harmonization and coordination of all efforts and programmes aimed at reducing aviation safety risks.

This type of broad-based and coordinated approach significantly lessens the financial and human resource burden on States in the affected regions while delivering measurable improvements to benefit local aviation safety performance outcomes.

Within the GASP framework, RASGs build on the work already done by States and existing subregional organizations such as cooperative development of operational safety and continuing airworthiness programmes (COSCAPs) and/ or regional safety oversight organizations (RSOOs). RASGs also support the establishment and operation of regional performance-based safety systems.
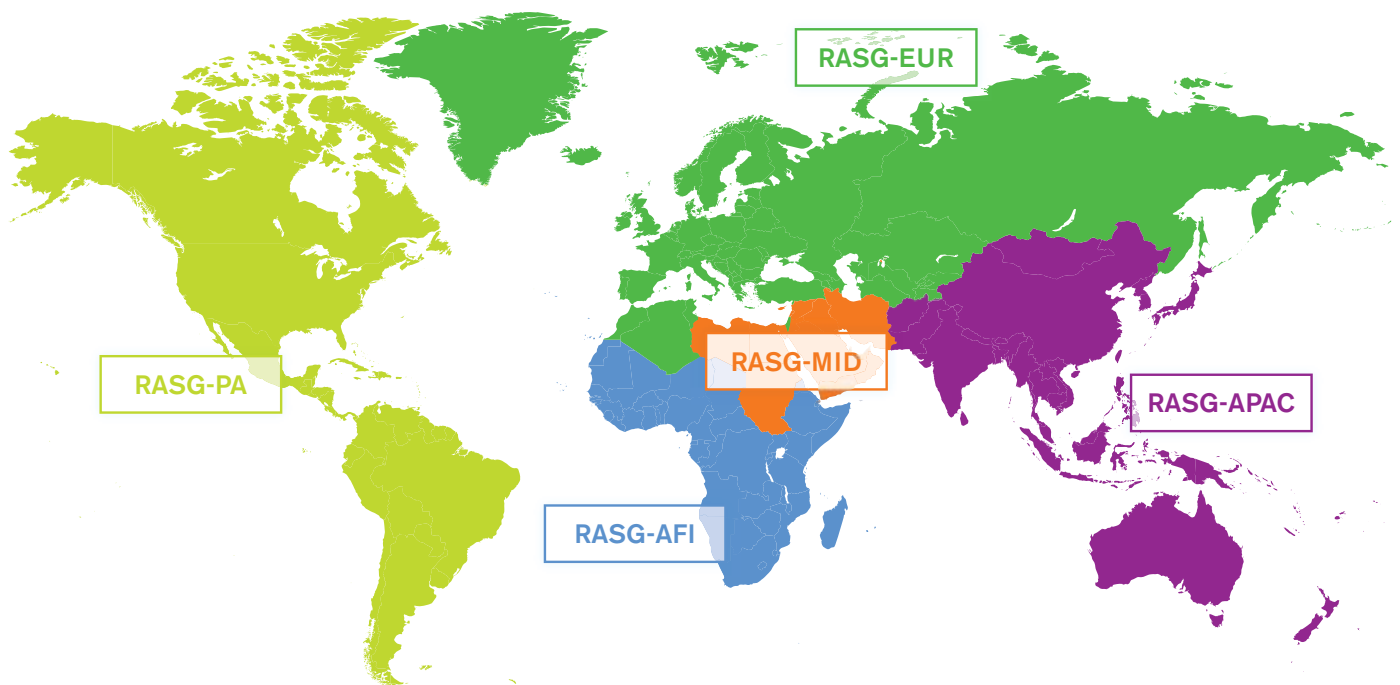
RASG Safety Analysis

The following sections provide an overview of the various safety analysis and monitoring indicators tracked by ICAO for each RASG. Each RASG produces its own safety report on a regular basis; however, the results presented below show the consolidated results by RASG area on a global scale for the first time.

Traffic Volume by RASG

Traffic volume for each RASG area is shown in the figure below. The traffic distribution figures below reflect the composition of RASGs, which are organized around ICAO regional offices in contrast to UN geopolitical regions.

FIGURE 7: 2012 Performed Scheduled Commercial Departures
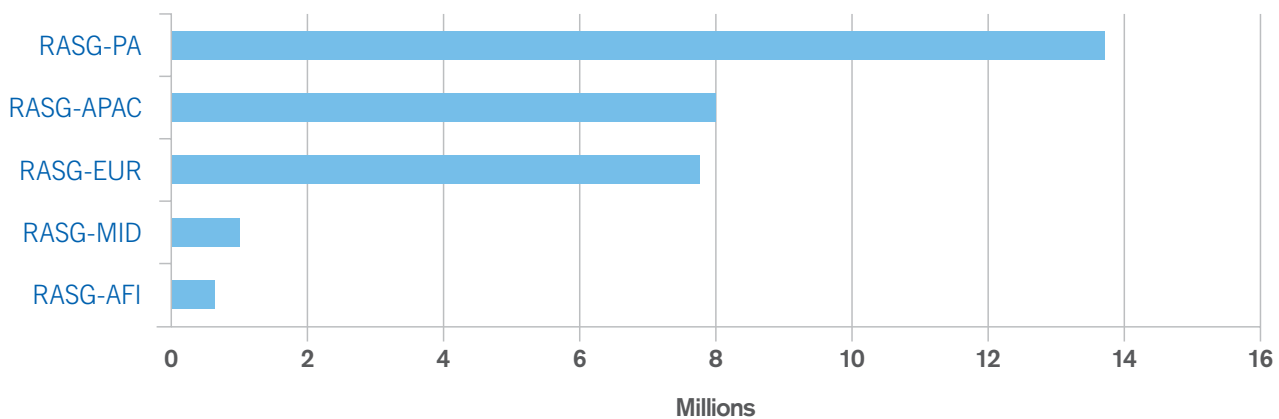
RASG Accident Rates

Figure 8 provides insight into the accident rates for each of the RASGs during the year 2012. The Africa-Indian Ocean RASG has the highest accident rate with 6 accidents per million departures, whereas the Middle East RASG has the lowest accident rate with 1.9 accidents per million departures.

FIGURE 8: Accident Rate by RASG Area - 2012
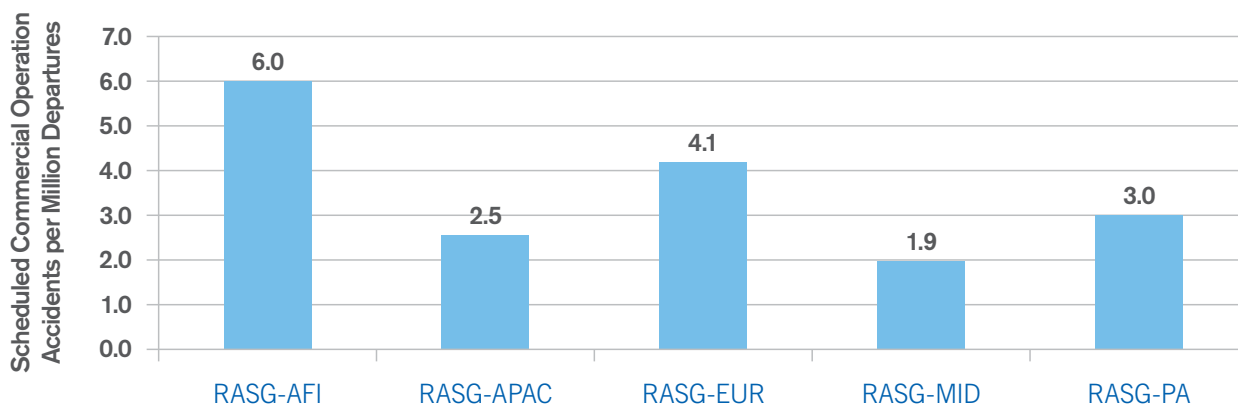
Preliminary 2013 Data

The number of scheduled commercial accidents during the first six months of 2013 by RASG area is shown below.

Thirty-six (36) scheduled commercial accidents were known as of the date of publication, 2 of which were fatal.

FIGURE 9: 2013 Preliminary Number of Accidents by RASG Area
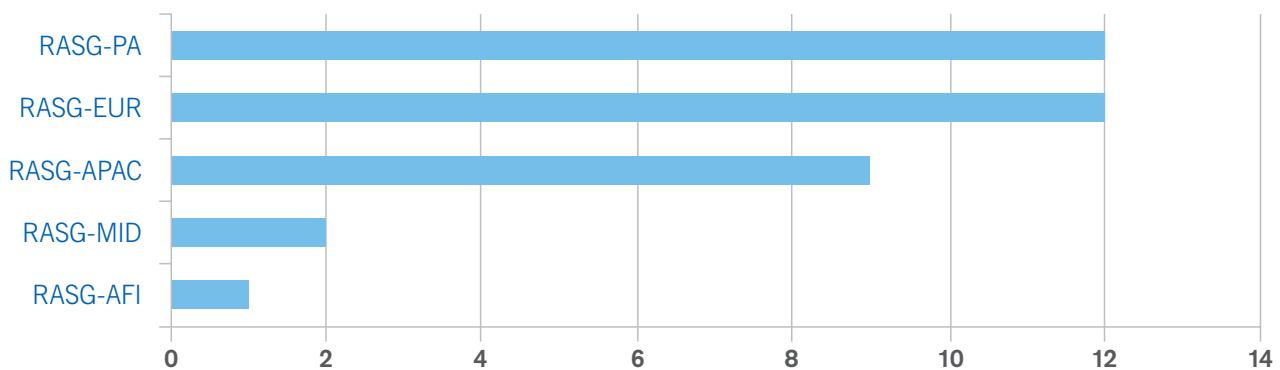
USOAP Results

The following provides an indication of USOAP results, measured as Effective Implementation (EI), for states in each RASG area. RASG-PA has the highest level of variability between state EI levels.

FIGURE 10: USOAP Effective Implementation Level by RASG Area

96%
72% RASG-EUR
92%
95%
27%
RASG-PA 67%
RASG-MID 67%
99%
63% RASG-APAC
79%
6%
29%
41% RASG-AFI
21%
4%
61% World
4%   99%

Implementation

Support Activities

Safety Collaborative Assistance Network (SCAN)

During the ICAO High-level Safety Conference in March 2010, a proposal was made for the creation of a group to facilitate transparency and information sharing.

From this proposal, the Safety Collaborative Assistance Network (SCAN) was formed to serve as facilitator and coordinator for the exchange of safety-related information regarding financial and technical assistance projects and activities.

SCAN provides a new communications channel for discussions amongst donors and assistance providers regarding ongoing projects and planning needs for future assistance endeavors. SCAN assists with matching donors to worthwhile projects and enables potential donors to analyse where assistance is needed. This allows donors and assistance providers to avoid costly and time-consuming duplication of efforts.

SCAN is compiling a list of existing assistance programmes and proposed assistance projects in need of funding, based upon an analys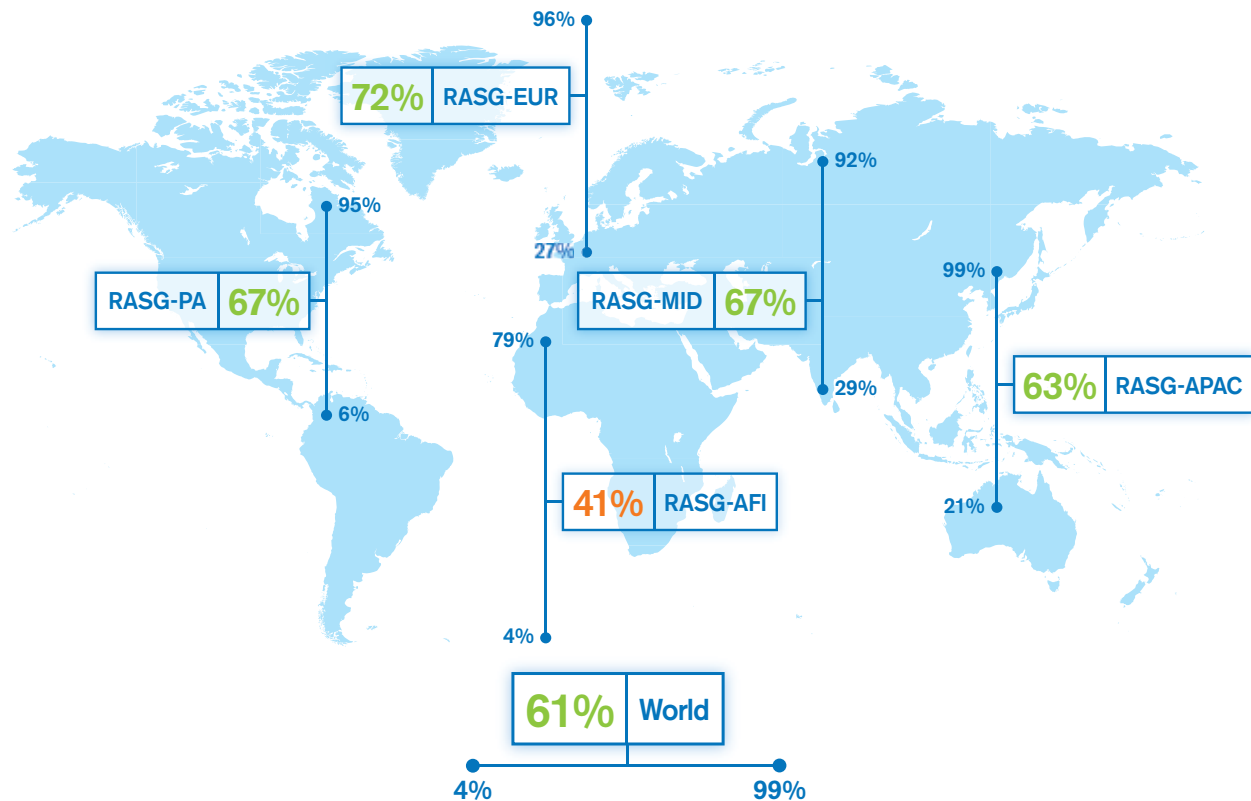is of safety-related data from a variety of sources. SCAN participants include focal points from governmental agencies, regional groups, manufacturers, financial institutions and aviation organizations that provide financial and/or technical assistance pertaining to civil aviation.

ICAO is working with States to develop targeted plans of action to address safety oversight deficiencies through risk-based analysis. The results of the analysis and information on assistance opportunities are shared through SCAN.

Global Safety Information Exchange (GSIE)

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 worked towards enhancing collection, coordination, analysis and exchange of aviation safety information among GSIE members as well as to disseminate pertinent information to the global aviation community.

The group is supporting the harmonization of global performance indicators. ICAO and IATA are specifically working together to publish an annual harmonized accident rate using agreed-upon metrics between the two organizations.

In the area of safety risk analyses, the GSIE has identified and the parties involved have agreed to address collectively the following high-risk areas: runway safety, controlled flight into terrain (CFIT) and loss of control–inflight (LOC-I). As an example of this collaboration, the U.S. Commercial Aviation Safety Team (CAST) agreed to share its safety metrics with the ICAO Regional Aviation Safety Group-Pan America (RASG-PA) to support the evaluation of safety enhancements for targeted risk areas in this region. CAST is developing safety metrics to be shared with RASG-PA and it is expected that this data will assist other RASGs and their members to assess the effectiveness of adopted safety enhancements in the high-risk areas identified.

Runway Safety Programme

Aviation has achieved a remarkable safety record, with fewer than 4 accidents experienced per million departures worldwide. Nonetheless, runway-related event categories consistently represent a large percentage of accidents on a yearly basis.

Improvements in runway safety are therefore essential if we are to achieve our overall objective to continually reduce the global accident rate, as well as related fatalities, despite a continual increase in air traffic for the foreseeable future.

As a result, the international aviation community has called upon ICAO to demonstrate leadership in the effort to reduce the number of runway-related accidents and incidents. Through its Runway Safety Programme, ICAO aims to coordinate a global effort to enhance runway safety.

Historical analysis has taught us that accidents are normally the result of contributing factors across multiple aspects of the aviation system. The ICAO Runway Safety Programme is therefore taking a multidisciplinary approach, requiring collaboration among regulatory authorities as well as stakeholders in air traffic management, airport operations, flight operations as well as the design and manufacturing sector.

The aim is to share best practices and other innovative approaches being developed by aviation safety experts to continuously reduce risks encountered in the critical takeoff and landing flight phases.

As part of the Runway Safety Programme, ICAO convened the Global Runway Safety Symposium (GRSS) at its Headquarters in May 2011. From this symposium, the framework for a series of regional runway safety workshops was identified, with commitment gained from partnering organizations for continued support and involvement. These regional seminars have been delivered in all ICAO regions following the themes of the Global Runway Safety Symposium. These seminars have provided regional-specific dialogue and guidance through the sharing of information and the identification of best practices to enhance runway safety. Six regional runway safety seminars were delivered in 2012 — in Amsterdam, Amman, Bali, Quito, Cape Town and Moscow. Two regional runway safety seminars were delivered in the first half of 2013 — in Agadir, Morocco and St. John's, Antigua and Barbuda. The primary objective of the seminars is to promote and support the establishment of multidisciplinary runway safety teams (RSTs) at individual airports.

Additionally, a survey to monitor progress on the establishment of RSTs was distributed to the aviation community and a RST Handbook was developed in close collaboration with ICAO's runway safety partners and is in the process of being finalized.

Assistance Success Stories

The cooperative spirit of ICAO's Member States, stakeholders, investment institutions and aircraft manufacturers has been consistently demonstrated through financial and technical assistance projects that have succeeded in raising the level of aviation safety.

International Organizations

IATA (International Air Transport Association)

Aviation supports nearly 7 million jobs in Africa. The continent's governments have much to gain from pursuing air transport growth and connectivity. But for a region with the world's worst safety rate, improved safety is central to that goal.

In May 2012, IATA, in collaboration with ICAO and a host of other organizations, committed to an Africa Strategic Safety Improvement Action Plan aimed at addressing safety deficiencies and strengthening regulatory oversight in the region by 2015.

The safety plan was further enhanced by the commitment of Africa's Directors General of Civil Aviation and by the Extraordinary Session of the Conference of Ministers of Transport held in Abuja, Nigeria, July 2012. This commitment, has been formalized in a document referred to as the 'Abuja Declaration'.

The plan is based on the following key priorities:

• Implementation of an effective and transparent regulatory oversight system. All African operators to implement the IATA Operational Safety Audit (IOSA)

• Implementation of runway safety measures

• Training on preventing loss of control

• Implementation of flight data analysis (FDA) to be supported through the IATA IPSOA programme

• Implementation of Safety Management Systems (SMS)

IATA has furthermore committed to assisting 10 additional African operators achieve IOSA certification.

ACI (Airports Council International)

ACI, pursuing its mission of promoting safer airport operations while contributing to international cooperation between the International Civil Aviation Organization (ICAO), aviation stakeholders and airports worldwide, has developed the Airport Excellence (APEX) in Safety Programme. The programme is based on ICAO Annex 14 Standards and Recommended Practices (SARPS) and ACI best practices. It takes the form of a Safety Review, including a self-assessment of the safety level, gap analysis, recommended solutions and design of an action plan following an on-site visit at an airport which has requested assistance to enhance their level of safety. APEX in Safety combines the mandate for regulatory compliance with the actual day-to-day operational needs of airports to maximize operational efficiency while enhancing the safety standards. Moreover, APEX in Safety provides several elements tailored to the individual needs of airports and proposes effective solutions which we expect will lead to improving the safety standing of the airports who participate in the programme.

CANSO (Civil Air Navigation Services Organization)

CANSO has an active safety programme that develops 'best practice' among Member air navigation service providers (ANSPs). It has delivered a Standard of Excellence in safety management systems, which is aligned with ICAO standards and recommended practices, and drives continuous improve-ment in safety management among ANSPs. While the ICAO recommendations describe what is expected of States, the CANSO guidance outlines how these requirements can be best met based on the collective experience of ANSPs.

CANSO will further roll out its Standard of Excellence to even more ANSPs in cooperation with industry partners and stakeholders, through promotion activity, publications and training aids.

State-to-State Assistance

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

Australia

Five Australian government agencies are involved in pro-grammes 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 Infra-

structure and Transport, the Civil Aviation Safety Authority, the Australian Transport Safety Bureau, Airservices Australia and the Australian Maritime Safety Authority. The cooperation 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 support and practical assistance to the Organization.

Canada

Canada believes that supporting regional initiatives is an ideal method of building capacity and extending the outreach of its assistance resources. Through the ICAO Technical Cooperation Bureau, Canada participates in the ICAO Co-operative Development of Operation Safety and Continuing Airworthiness Programmes (COSCAP) as a financial and in-kind contributor, with its latest efforts focused on North Asia (NA). Since 2005, Transport Canada Civil Aviation (TCCA) has contributed 1.04 million USD to this programme. As an in-kind contributor, TCCA employees have been working in cooperation with the COSCAPs, including chief technical advisors collaborating with COSCAP-NA and the COSCAP in South East Asia (SEA). Canada has also provided training in different regions, including regular training by specialists on dangerous goods. Canadian subject matter experts are assigned to various locations including a licensing specialist in Sudan. Foreign civil aviation authorities also meet with TCCA to share information on a variety of aviation safety topics.

Jordan

Through an agreement between Jordan Civil Aviation Authority and Sudan Civil Aviation Authority with a total cost of 206,000 EURO, Jordan has provided technical expertise that facilitated substantial improvements to Sudan's aviation system in the area of aerodromes and safety management. As a result of the cooperation, a Jordanian expert remains in contact with his counterpart in Sudan to maintain the sustainability of services.

Mauritania

After significant improvement of the safety oversight capabil-ities of its Civil Aviation Authority, Mauritania, encouraged by ICAO, is responding positively to requests for assistance from African civil aviation authorities.

Mauritania shared its experience in the enhancement of the technical areas of aircraft accident investigation and aerodromes with Madagascar, resulting in fruitful exchanges on vision, policy and guidance material. In June 2013, a Sudanese delegation visited Nouakchott to observe the Mauritanian approach on implementing a performance-driven civil aviation authority. The visit also focused on Mauritania's experience in establishing a proactive framework for cooperation and communication with ICAO and the European Union to develop an effective strategy to gradually resolve safety-related deficiencies and to achieve international recognition.

These initiatives have led other States, such as the Comoros Islands, to request assistance to resolve its safety deficiencies. Mauritania has responded positively to this request and has taken necessary steps to support the State.

The Netherlands

The Netherlands Ministry of Infrastructure and the Environment has financed a program to improve aviation safety in the East African Community (Burundi, Kenya, Rwanda, Uganda and United Republic of Tanzania). In 2012, the programme's main areas of focus were the optimization of air navigation services and aeronautical information management along with the improvement of the safe use of airports concentrating on airside safety, apron planning and rescue and firefighting training. Through participating organizations, the programme also contributed to maturing safety management systems in the African region by focusing on safety policy and objectives as well as safety promotion components.

Another area of focus is the improvement of aviation safety in the Caribbean. Several missions were conducted by the Ministry to the Civil Aviation Authorities of Curaçao and Sint Maarten to improve their organization and develop regulations and procedures for civil aviation. The Ministry also organized training sessions on Safety Assessment of Foreign Aircraft (SAFA) focusing on inspectors' training and SAFA awareness for the local operators in Curaçao, Sint Maarten and Aruba.

Singapore

Singapore, through the Singapore Aviation Academy (SAA) (an ICAO TRAINAIR PLUS Full Member since 2012), has provided training to over 5,500 personnel from 174 countries under fellowships provided by the Singapore Government. The aviation safety training programmes cover Government Safety Inspector (GSI) programmes conducted by SAA as an ICAO-endorsed GSI training centre. As a member of the COSCAP-SEA, Singapore has contributed 807,783 USD

toward training and has provided technical assistance to enhance aviation safety standards in the region. Singapore has also contributed in the development and enhancement of international standards by providing technical expertise to the work of ICAO.

United Arab Emirates

The UAE, through the General Civil Aviation Authority (GCAA), has contributed towards enhanced coordination of accident and incident investigation activities in the Middle East. The State's contributions include a proposal for a study on a 'Joint Investigation Unit' manpowered by the Arab Civil Aviation Commission (ACAC) member States and a workshop on cooperation for accident investigation activities held in Abu Dhabi in November 2012 attended by eight States (Bahrain, Egypt, Jordan, Kuwait, Lebanon, Oman, Saudi Arabia and UAE) and six Organizations (Airbus, Boeing, COSCAP-GS, IATA, ICAO, Air Accident Investigation-Singapore). These activities may lead to the establishment of a regional accident and incident organization (RAIO).

United States

The U.S. Trade and Development Agency (USTDA) has entered into bilateral agreements with China, India and Brazil to pursue technical cooperation in the aviation sector, supporting airport expansion, airspace management and safety. In China, various aviation workshops are being hosted to provide managerial, technical, safety, efficiency, capacity and operational training. In India, a grant was awarded to the Airports Authority of India to support predictable and efficient operations. Whereas Brazil is receiving assistance on airport development and network modernization plans in addition to multiple training activities in preparation for the 2014 World Cup and 2016 Olympic Games. USTDA also hosted the U.S./Latin America Aviation Summit in December 2012 to promote cooperation between the U.S. and eight States in Latin America. USTDA is also funding technical assistance in Azerbaijan to promote conformance with ICAO guidelines.

In 2012, under the Safe Skies for Africa (SSFA) Program, the Federal Aviation Administration (FAA) Academy conducted Government Safety Inspector (GSI) training in Botswana and Inspector Training Systems (ITS) and safety management systems training in Cape Verde, Ghana, Kenya, and Nigeria. The FAA Academy also delivered training covering the concepts, tools and processes for developing a compliance and enforcement programme as well as improving existing guidance materials in Kenya and Uganda. The FAA Academy also worked with ICAO, the Next

Generation of Aviation Professionals group and the Africa Association of Aviation Training Organizations to expand the footprint of the SSFA program.

The U.S. Government's Millennium Challenge Corporation (MCC) targets aviation safety through infrastructure investments and institutional policy reforms as a means to expand access to markets and facilitate trade. In the United Republic of Tanzania, MCC is investing approximately 8 million USD to upgrade the airport on Mafia Island including the paving of the 1.4-kilometer runway. MCC invested 181 million USD in Mali to modernize and expand Bamako-Sénou International Airport, strengthen its civil aviation safety and airport authorities as well as foster a stronger regulatory framework governing Mali's civil aviation sector.

Africa

Air transport is a major contributor to global economic prosperity and plays a key role to facilitate economic growth, especially in developing nations. Most ICAO Member States in Africa continue to face challenges in the effective implementation of SARPs, resulting in safety deficiencies that pose challenges to the growth of civil aviation in the region.

The Comprehensive Regional Implementation Plan for Aviation Safety in Africa (AFI Plan) was established in January 2008 to support African States in addressing aviation safety deficiencies. The implementation of the AFI Plan is led by the ICAO Regional Offices in Dakar and Nairobi, and supported by ICAO Headquarters, Member States and aviation safety partners. Africa has also demonstrated its commitment to promote reliable and sustainable safe air transport by adopting a high-level set of targets designed to improve aviation safety. These aviation safety targets were adopted during the Ministerial Conference on Aviation Safety in Africa, held in Abuja, Nigeria in July 2012, and endorsed by the Assembly of Heads of State and Government of the African Union in January 2013.

The AFI Plan has supported numerous initiatives to assist States in enhancing their civil aviation systems. With the objective of assisting States to address their serious safety deficiencies in a prioritized manner, 23 ICAO Plans of Action have been developed for States with significant safety concerns and a low level of effective implementation of the critical elements of a safety oversight system. Assistance activities included in the Plans are performed by ICAO in conjunction with aviation safety partners, including the Africa-Indian Ocean Cooperative Inspectorate Scheme (AFI-CIS) missions implemented by the African Civil Aviation Commission (AFCAC).

In the area of training, the AFI Plan supports the establishment and evolvement of the Association of African Aviation Training Organizations (AATO) and over 2,193 trainees from various States in Africa benefitted from 66 courses conducted from 2008 to 2012 throughout the Continent. The Plan also promotes the establishment and strengthening of regional safety oversight organizations, such as the Banjul Accord Group Aviation Safety Organization (BAGASOO) and the East African Community Civil Aviation Safety and Security Oversight Agency (CASSOA), as a means to facilitate the pooling of scarce resources.

These efforts have already shown tangible results. Guinea, Guinea-Bissau, Mali, Mozambique, Rwanda, Seychelles, Sudan and Zambia have addressed their significant safety concerns; Mauritania and Sudan have met the target of 60 per cent of effective implementation of the critical elements of a safety oversight system and significant improvements were also noted by the Universal Safety Oversight Audit Programme (USOAP) in Benin and Madagascar. Although considerable progress has been made and significant actions have been undertaken to enhance safety in Africa, it should also be recognized that continuous support of ICAO, States, industry and donors is still required for safety concerns to be fully addressed and resolved.

European Union

In addition to the numerous projects provided by Member States of the European Union (EU) to other ICAO Member States, the EU is involved in a variety of assistance projects related to aviation safety. EU assistance is targeted towards improving the level of safety in States and regional organizations that lack resources or technical expertise. Projects are financed, and sometimes managed, by the European Commission. The key partner of the European Commission in this work is the European Aviation Safety Agency (EASA).

The EU is involved in a number of initiatives to support States in fulfilling ICAO safety Standards. Such initiatives include the Instrument for Pre-accession Assistance (IPA-II) in South Eastern Europe to ensure an appropriate regulatory framework for aviation safety in the region; the Transport Corridor Europe-Caucasus-Asia (TRACECA) focusing on capacity-building of civil aviation authorities; the Mediterranean Aviation Safety Cell (MASC) promoting harmonization of safety standards, rules and procedures as well as collection, exchange and analysis of safety data.

The EU recently launched the "Support to the Improvement of Aviation Safety in Africa" (SIASA) programme to assist States in improving the implementation of ICAO safety Standards

and in resolving safety deficiencies, including significant safety concerns (SSCs). This programme also supports regional safety oversight organizations (RSOO) in Africa.

In Asia, the EU also finances a number of aviation projects in India and China and specific regional initiatives, including the Association of Southeast Asian Nations (ASEAN), South Asian Regional Initiative (SARI) and South East Asia Regional Initiative Forum (SEARIF).

Technical assistance is also provided through "twinning projects" whereby the EU finances part of the projects and the technical support is provided by European aviation authorities. Current twinning projects are being implemented in Georgia, Ukraine, Morocco and Algeria.

Stakeholders

Additional stakeholders play a key role in enhancing aviation safety. Together they support the improvement of the global and regional air transport system.

AFCAC

In August 2011, the African Civil Aviation Commission (AFCAC), a specialized agency of the African Union, launched the AFI-CIS project with technical support from ICAO. The aim of AFI-CIS is to create a pool of qualified and experienced aviation safety inspectors from within the AFI Region to provide assistance to African States in addressing their safety oversight deficiencies. AFI-CIS is focused on States with significant safety concerns (SSCs) and with low effective implementation of safety-related Standards. As of May 2013, 32 States and two RSOOs have joined the AFI-CIS programme. There have been 12 assistance missions conducted in seven States. AFCAC has funded all the missions except one and coordinates with RSOOs to facilitate follow-up activities.

AFCAC also organizes, coordinates and hosts meetings, courses and seminars on aviation safety, human resources development, regional challenges and initiatives and capacity building. In collaboration with Nigeria and under the auspices of the African Union Commission (AUC), AFCAC organized the Ministerial Conference on Aviation Safety in Africa in July 2012 which adopted the Abuja Declaration that identified aviation safety targets and an action plan for Africa.

CERG

The Central European Rotation Group (CERG) represents Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia on the Council of ICAO. In an effort

aimed at increasing aviation safety, CERG has supported a series of four international courses for safety experts and safety aviation investigators in co-operation with the Southern California Safety Institute (SCSI) and the Czech Republic's authorities attracting the participation of 35 safety experts and safety aviation investigators. In the past 11 years, similar courses in Prague have welcomed the participation of more than 400 safety experts and investigators from different parts of the world.

In addition, the Polish Civil Aviation Authority successfully organized the ICAO/CERG Air Law Conference in Warsaw in September 2012. With over 200 participants, the conference focused on issues in the international legal framework pertaining to aviation safety, including unmanned aircraft systems, licensing and training. Poland also supports international and regional initiatives by providing expertise to technical groups, including the European Aviation Safety Team (EGAST), the European Authorities Coordination Group on Flight Data Monitoring (EAFDM), the regional aviation safety group (RASG) and the Safety Management Panel (SMP).

CIS

The COSCAP for the Commonwealth of Independent States (CIS) has been an important source of technical assistance to 12 countries in the region for the past 12 years. The project, supported by Airbus and Boeing, focuses on aviation safety regulations developed in English and Russian. Numerous training activities in the areas of flight safety and airworthiness delivered by specialists from the Russian Federation and Interstate Aviation Committee (IAC), Airbus, Boeing, FAA, have benefitted about 7000 civil aviation specialists from the States in the region.

Within the framework of the Commercial Aviation Safety Team (CAST)-CIS and International Helicopter Safety Team (IHST)-CIS, teams of specialists have been established to cooperate with similar teams from North America and Europe to ensure a coherent and coordinated approach in resolving flight safety shortcomings in the region.

ICAO Technical Cooperation Bureau (TCB)

ICAO TCB promotes the enhancement of aviation safety, through the implementation of technical assistance and cooperation projects in agreement with States. Through TCB projects, the civil aviation authorities of various ICAO Member States receive support in updating legislation, regulations and procedures, training for their professionals and infrastructure development. This support aims at establishing efficient and effective aviation safety oversight as well as developing air

navigation and airport services. In 2012, 62 national and 25 regional active projects contributed towards the improvement of aviation safety around the world. These projects, mainly funded by the respective governments, had a total cost of 103.6 million USD.

TCB also implemented projects in Madagascar and South Sudan funded by the ICAO Safety Fund (SAFE) to review their civil aviation legislation and to provide recommendations to address safety shortcomings.

BAGASOO

The Banjul Accord Group Aviation Safety Oversight Organisation (BAGASOO) is the outcome of a cooperative agreement between Cape Verde, Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone to institutionalize the COSCAP Project. The objective is to enhance the safety and efficiency of air transport in the subregion by: establishing a regional core of highly qualified safety inspectors, serving as cost effective means for participating governments to meet international safety oversight obligations; providing on-site training of national inspectors; promoting harmonization of regulations and procedures; and coordinating technical assistance programmes for member States.

With the collaboration of FAA and support from SSFA, a total of 242 aviation personnel from the civil aviation authorities and the industry in BAG member States have received training in the areas of safety management systems, inspector training system (ITS) and resolution of safety concerns. Technical assistance is being given to Guinea, Liberia and Sierra Leone to resolve their safety oversight deficiencies. BAGASOO has also developed an ITS database software to serve as a common framework for the training and qualification of inspectors in the subregion in addition to an Inspector Training Records and Qualification System (I-TRAQS) and Foreign Aircraft Safety Assessment Records (FASAR) databases.

CASSOA

The East African Community Civil Aviation Safety and Security Oversight Agency (EAC CASSOA) provides a forum for the East African States (Burundi, Kenya, Rwanda, Uganda and United Republic of Tanzania) and coordinates activities as an RSOO. CASSOA has steered the harmonization of civil aviation regulations and guidance material on flight safety, aerodromes and air navigation services. The Agency in partnership with EASA has installed the SOFIA system as a working tool for certification, licensing and inspection in all EAC partner States. The EAC aviation examination system

has been procured with funding from development partners to harmonize personnel license exams in East Africa. CASSOA also promotes sharing of aviation technical expertise within the East Africa region which has benefitted all partner States.

Investment Institutions

Investment institutions play an important role in raising global aviation safety levels, as evidenced by the following successes achieved through their support.

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 compliance with aviation safety standards, enhance environmental performance and promote economic growth and development. As of 2012, the EIB is acting as the lead financier for the extension of the European Geostationary Navigation Overlay Service (EGNOS) coverage to the ASECNA area in Central and West Africa. The EIB is also assessing the possibility of financing an airfield upgrade project in Mozambique and development projects in Lesotho and Malawi.

World Bank

The World Bank Group is a source for financial and technical assistance to developing countries through low interest loans, grants and interest-free credits. In Fiscal Year 2012, the World Bank's Air Transport Portfolio included nearly 30 projects or project components in all six World Bank regions, as well as 20 active International Finance Corporation (IFC) investments and several advisory mandates, with a total volume of 1,25 billion USD.

A particular highlight of 2012 has been the approval of the $125 million USD regional Pacific Aviation Investment Program (PAIP) in the South Pacific to improve operational safety and oversight of international air transport infrastructure in the region. The focus of the first phase of the regional programme is in Kiribati, Tonga and Tuvalu, while possible subsequent phases will focus on, Samoa, Solomon Islands and Vanuatu. The World Bank also continues its active engagements in all other regions, particularly in Africa. Commitments to Sierra Leone and the United Republic of Tanzania were recently approved.

Aircraft Manufacturers

Aircraft manufacturers contribute significantly to global aviation safety programmes. The following summarizes the contributions of Boeing and Airbus to recent safety-related challenges.

Airbus

Airbus is supporting the deployment of the ICAO performance-based navigation (PBN) road map in several regions, in cooperation with the French civil aviation authority (DGAC), the French civil aviation school (ENAC) and local authorities of the States concerned. In 2013, Airbus started promoting a possible PBN solution for airports currently using circle-to-land approaches. Mitigating unstabilized approaches and facilitating access to complex airports have proven to be efficient ways to mitigate risks of runway excursions.

Support is also delivered to regional aviation safety groups (RASGs) and to each Co-operative Development of Operation Safety and Continuing Airworthiness Programme (COSCAP). Upon request, technical experts deliver lectures, training and workshops.

Boeing

Boeing has entered into a Memorandum of Agreement with the government of Indonesia to cooperate in regulatory, industrial, infrastructure and personnel development in addition to safety and operational assessments. Boeing regulatory affairs representatives are working with the Indonesian Civil Aviation Authority in regaining FAA Category 1 status. In addition, assistance will be provided to Mozambique to improve their aviation safety and oversight capabilities.

Boeing delivers in-kind support for COSCAPs in Asia, Africa, and the Middle East by sending subject matter experts to conduct training activities on aviation safety topics. Assistance is also provided to RASGs by co-chairing industry-government sub teams in Asia and Pan America. Boeing provides both financial and *bona fide* support while it serves as a liaison with CAST to promote information sharing initiatives, having concluded the information sharing agreements between RASG-PA and CAST as well as APAC-RASG and CAST.

Technical Initiatives

Accident Investigation and Support

Library of Safety Lessons

A wealth of safety lessons learned during accident and incident investigations are available in the associated Final Reports, which States submit to ICAO.

To disseminate the safety lessons and information captured in Final Reports to a wider audience, which includes safety investigators, other safety officers, aircraft operators, airport operators, air traffic controllers, aircraft maintenance personnel, etc., ICAO is developing an *E-library of Final Reports*. The E-library will be available on the AIG website which is accessible through the ICAO public website and will be launched in the second half of 2013.

The *E-library of Final Reports* will provide a function to search specific attributes of accidents and incidents, for example: date, State of occurrence, aircraft type. This will enable locating Final Reports of a specific accident/incident or a set of accidents/incidents of particular interest.

Similarly, safety recommendations addressed to ICAO and safety recommendations of global concern (SRGC) will be made available on the Accident Investigation Group (AIG) website. This will improve access to information on mitigation actions related to safety deficiencies identified during accident/incident investigations and safety studies.

Expediting Accident Investigations

Modern aviation operations provide increasing opportunities to utilize flight data in accident investigations.

ICAO considers these aspects when reviewing provisions for flight recorders on a regular basis. The subjects below are currently under discussion:

- **Establishing the accident site** within a 6 NM radius to facilitate the location and recovery of on board flight recorders and have the flight data available for investigation purposes.

- **Automatic deployable flight recorders** have been considered as one of the options to ensure that flight recorder data is available for accident investigation and have the additional benefit of an ELT to locate the wreckage and recorder.

- **Lightweight recorder systems** specifically designed for small aircraft are being considered to address the lack of audio data during accident/incident investigations of small aeroplanes and helicopters involved in commercial operations.

Due to the developments in Remotely Piloted Aircraft Systems (RPAS), ICAO is also considering future requirements for the carriage of flight recorders in these systems.

Assisting States in Establishing Accident Investigation Authorities

To assist States in complying with their obligations regarding investigation of accidents and incidents for the advancement of safety, ICAO has assessed all findings related to investigations that were identified during the USOAP audits. The main objective was to assist States with the implementation of measures to ensure that Annex 13-type investigations are effectively conducted.

The outcome of the project highlighted the area of "Law & Regulations" as posing a high risk to a State's ability to successfully conduct investigations. The possible reasons included the following:

- Limited understanding regarding the importance of having an independent accident investigation authority.

- Lack of legislation and regulations required for an effective accident investigation authority.

- Limited knowledge regarding the information and guidance contained in existing ICAO Annexes, manuals and guidelines.

As a consequence, model frameworks of AIG-related legislation and regulations were developed, namely "ICAO Sample Legislation and Regulation on Accident and Incident Investigation". These framework samples will be incorporated in the second edition of the *Manual on Accident and Incident Investigation Policies and Procedures* (Doc 9962) in early 2014.

Coordinated Inter-Agency Response to Radiation Incidents and Emergencies

On 11 March 2011, a magnitude 9.0 earthquake occurred just off the east coast of Japan. A tsunami caused by the earthquake soon inundated the coastline of the Fukushima prefecture, and elsewhere, and resulted in substantial damage to and the release of radiation from the Fukushima Daiichi nuclear power plants (NPP) of the Tokyo Electric Power Company.

As a co-sponsoring organization, ICAO had been involved for number of years in assisting the International Atomic Energy Agency (IAEA) and other concerned international organizations in the development and maintenance of a Joint Radiation Emergency Management Plan. The Joint Plan provides a common understanding and describes an inter-agency framework for preparedness for and response to an actual, potential or perceived radiation incident or emergency independent of whether it arises from an accident, natural disaster, negligence, a nuclear security event or any other cause. During the response to the Fukushima Daiichi NPP accident, the Joint Plan was used intensively by the participating organizations, facilitating a coordinated and collaborative response.

Taking into account lessons learned and experiences gained, ICAO has worked with the IAEA and the other international organizations concerned to develop and integrate new and/or improved emergency preparedness and response arrangements into a new 2013 edition of the Joint Plan. The 2013 edition of the Joint Plan is the sixth edition of the inter-agency framework. The Joint Plan is available on the IAEA web site at www-pub.iaea.org/books/IAEABooks/ Series/124/Emergency-Preparedness-and-Response.

The Joint Plan now includes details of an ad hoc working group on air and maritime transportation which has been recently established as a direct result of a proposal made by ICAO in 2011 in response to the Fukushima Daiichi NPP accident. In addition to international organizations such as ICAO, IAEA, IMO, WHO and WMO, the ad hoc working group comprises transportation modal agencies including Airports Council International (ACI), the International Air Transport Association (IATA) and the World Tourism Organization (UNWTO). Taking into account the inter-agency framework described by the Joint Plan, the ad hoc working group will assist those involved to respond efficiently and effectively whenever a radiation incident or emergency is having or is perceived may have an impact on safe and efficient international air and maritime operations.

Flight Operations

Airworthiness (Safety Technical Initiatives)

Fourteen per cent of accidents involving scheduled commercial flights in 2012 were due in part to system component or power plant failures. In order to address this, the third edition of the *Airworthiness Manual* (Doc 9760) was completed during 2013 to better assist States in implementing effective oversight in the area of airworthiness. The new edition is more user-friendly and has been restructured and updated with the emphasis on improving the guidance relating to the responsibilities of States of Registry, States of Operator and States of Design. Thus far, five seminars have taken place in Asia and the Middle East to introduce the new edition to Civil Aviation Authorities and industry in the two regions.

ICAO will continue to progress safety-related projects such as harmonization and recognition of approved maintenance organizations, States' responsibilities when a type certificate is suspended or revoked, and security sensitive airworthiness directives.

Fatigue Risk Management

Following on from the successful adoption of fatigue risk management system (FRMS) provisions for flight and cabin crew in 2011, ICAO is now focusing on fatigue management approaches for air traffic controllers (ATCs). To this end, ICAO established an ATC arm of the FRMS Task Force this year. They are working to develop a proposal for fatigue management Standards and Recommended Practices in Annex 11 supported by comprehensive guidance material to enable regulators to oversee, and air navigation service providers (ANSPs) to implement, prescriptive and risk-based ATC fatigue management approaches. The proposal is planned to be presented to Council for consideration for adoption in May 2015. Subsequently, and as part of its ongoing commitment to providing current information on fatigue management approaches based on scientific principles, ICAO will host a Fatigue Management Symposium in the third quarter of 2015.

Approach Classification

Runway safety has been identified as one of the high-risk accident categories. Runway excursions after an approach and landing operation have contributed to this category. An important mitigating factor for runway excursions is the ability to fly stable approaches. Accordingly, in an effort to promote stable approaches, ICAO performed a complete restructuring of the instrument approach classification in order to: address confusion in the cockpit on approach terminology; set a firm basis of classification that can be applied for new and future operations (PBN, EVS, SVS etc.); and create the missing link in runway-related ICAO documentation that will facilitate the implementation of instrument approach procedures with vertical guidance.

The new approach classification will provide aerodrome operators with a pragmatic tool, based on operational needs, to phase in instrument approach operations over time until runway visual aid infrastructure can support the lowest achievable minima. Additionally, for pilots, instrument approach operations will be flown using nearly the same method. This will simplify instrument approach flight techniques, and facilitate pilot training which, in turn, will reduce unstable approaches.

Controlled Flight into Terrain (CFIT)

ICAO Assembly Resolution A31-9 urges States to implement the ICAO program for the prevention of CFIT. ICAO introduced a number of amendments to SARPs and related guidance material to reduce the risk of CFIT accidents. ICAO was also an active participant of the Flight Safety Foundation Approach and Landing Accident Reduction (ALAR) Task Force.

Accident data indicates that controlled flight into terrain (CFIT) accounts for just over 12% of all fatal accidents, a disproportionately high percentage given the low proportion of all accidents attributed to this category. While ICAO and other organizations have undertaken a number of initiatives over the past 15 years which have met with some success, the data would suggest that additional efforts should be considered. An awareness campaign has been initiated by the Regional Aviation Safety Groups (RASGs) containing information air operators may utilize to develop Standard Operating Procedures and training for pilots. These include, amongst other, the use of instrument approaches with vertical guidance, the use of the continuous descent final approach (CDFA) technique when flying approach procedures with lateral guidance only and recurrent training of escape maneuvers based on Ground Proximity Warning Systems (GPWS) with forward looking terrain avoidance functions.

Loss of Control in Flight – LOC-I

LOC-I was the major killer in civil aviation during the years 2006–2010, resulting in ICAO setting a high priority to developing mitigating measures to reduce the LOC-I accident rate. This takes a 2-phase approach: establishing training requirements for upset prevention and recovery in commercial aviation and launching a human performance review to identify ways for pilots to improve their monitoring skillset, the response to startle effects and other aspects of human performance. The Upset Prevention and Recovery Symposium will be focused on the 2 phases: a roll-out of the new ICAO provisions regarding upset prevention and recovery training and a forum to identify the issues related to human performance during LOC-I.

Licensing and Training Guidance

ICAO has published a new Manual on the *Criteria for the Qualification of Flight Simulation Training Devices*, Volume II – *Helicopter* (Doc 9625), with provisions aimed at facilitating the development and qualification of helicopter simulators to improve pilot training. Updates to the *Manual on the Approval of Training Organizations* (Doc 9841) and the *Manual on Procedures for the Establishment and Management of a State's Personnel Licensing* System (Doc 9379) were also published to support Licensing Authorities.

International Pilot Training Consortium (IPTC)

Since the late 1940s, commercial aviation organizations worldwide have made significant investments in pilot training initiatives, principally on an individual basis. While these individual initiatives have generally met with success, they stretch the resources of the individual organizations, result in divergent solutions to shared challenges, and do not benefit from the synergies that could result through a combined and coordinated effort. During 2012, ICAO entered into a collaborative initiative with the International Air Transport Association, the International Federation of Airline Pilots Association and the Royal Aeronautical Society to form the IPTC. The IPTC will provide the partnership for the necessary coordinated effort and, through this partnership agreement, the partners will collaborate with the aim of reducing the accident rate and, at the same time, ensuring that there are sufficient competent pilots in this growing sector of the industry. IPTC aims at improving safety, quality and efficiency of commercial aviation by developing international agreement on a common set of pilot training, instruction and evaluation standards and processes that will result in ICAO provisions.

Training

Aviation Language Requirements

Since March 2003, ICAO has been investing significant resources to support the implementation of safety-critical provisions related to aviation language requirements.

In October 2011, ICAO launched the Aviation English Language Test Service (AELTS). (https://www4.icao.int/aelts). Through AELTS, testing instruments are assessed against the ICAO language testing criteria. This service is particularly important as language proficiency testing is largely unregulated and has resulted in a great amount of variability in the approaches used and outcomes achieved. AELTS provides a means for the aviation language testing community to standardize and improve their practices.

In 2012, the Organization launched a new edition of the training aid *ICAO Language Proficiency Requirements – Rated Speech Samples*. The document can be accessed at http://cfapp.icao.int/rssta/index.cfm and contains 52 speech samples that have undergone rigorous rating and validation processes.

TRAINAIR *PLUS* Programme *Contribution to Aviation Safety*

The TRAINAIR *PLUS* Programme (TPP) has become a significant tool for global aviation safety and training. Its mission is to improve the safety and efficiency of air transport through the establishment, maintenance and monitoring of high standards of training on a worldwide basis and in a cost effective manner.

As of May 2013, more than 50 aviation training centres from all continents have joined the TRAINAIR *PLUS* cooperative network and are participating in the production and sharing of safety-oriented Standardized Training Packages (STPs). More than 15 STPs are now available for international sharing to support State and industry training plans (Figure 11). Additional STPs are being actively prepared by TRAINAIR *PLUS* members and will further enrich the sharing system and the STP Library.

FIGURE 11: Topics of TRAINAIR *PLUS* Standardized Training Packages (STPs) developed and under development (as of 1 May 2013)

Aeronautical Operations and Information services

Air Traffic Management

Air Transport and Airline Services

Airport Management and Operations

Civil Aviation Administration

Environment

Performance Based Navigation Services

Safety Management

Training Technologies
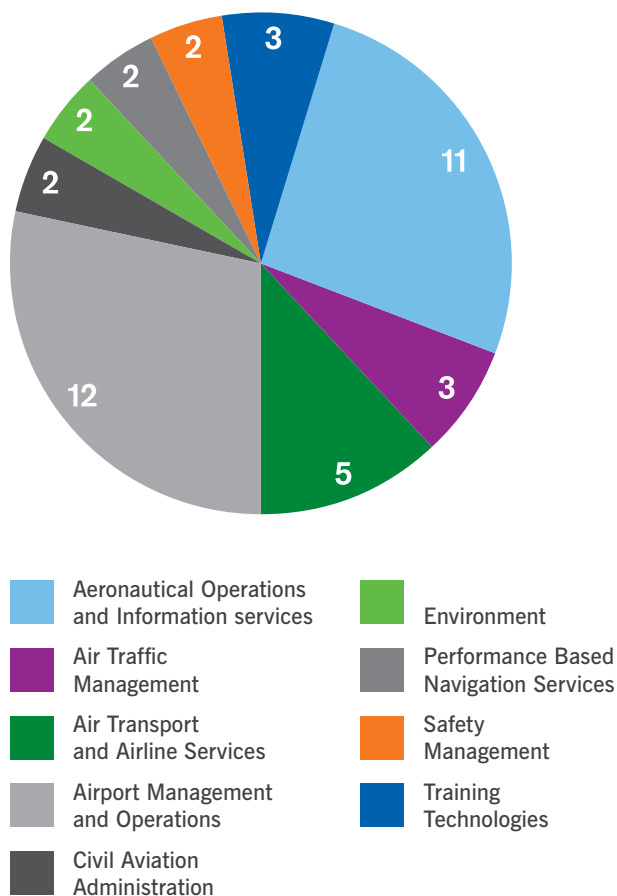
The ICAO TRAINAIR *PLUS* Training Development Guide — *Competency-based Training Methodology* (Doc 9941) contains guidelines and a methodology for the development of competency-based courses. The methodology is taught through the TDC which provides the necessary knowledge and skills to apply the TRAINAIR *PLUS* course development methodology. There were more than twenty (20) TDC sessions delivered in 2012.

Aerodromes

New Sarps for Enhancing Aerodromes Safety and Efficiency

A comprehensive amendment to Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations*, and Volume II — *Heliports* was adopted by the ICAO Council in February of 2013 with the applicability date of 14 November 2013.

This amendment is aimed at enhancing aerodrome safety and efficiency in a globally harmonized manner. In a nutshell, the amendment provides for new and amended SARPs that cover the following:

- runway end safety areas (RESA) and arresting systems to mitigate consequences of a runway overrun;

- effective runway surface friction measurement and reporting for the reduction/prevention of runway excursions;

- strength of blast pads to avoid engine ingestion of foreign object debris (FOD) during take-off;

- simple touchdown zone lights to provide pilots with enhanced situational awareness for the prevention of runway excursions;

- enhanced taxiway centre line marking, stop bars and runway guard lights (RGLs) for the prevention of runway incursions;

- rescue and fire fighting (RFF) at aerodromes, including modular testing of emergency plans, the new and more efficient performance level "C" foam, revised quantities of extinguishing agents including reserve agents;

- siting of equipment and installations on aerodrome operational areas to allow the use of certain devices for aircraft safety purposes;

- aerodrome maintenance, including removal of contaminants;

- maximum allowable tire pressure category in the reporting of strength of aerodrome pavements to more efficiently utilize airfield pavements;

- use of LED technology for visual aids to reduce energy consumption;

- height of objects at heliports permitted on the safety area and around the edge of final approach and take-off areas (FATO) or touch down and lift-off areas (TLOF) to avoid obstacle strikes;

- objects in relation to helicopter ground and air taxi-routes and helicopter stands

- obstacle environment, including obstacle limitation surfaces associated with PinS approach utilizing a visual segment, to ensure safety while enhancing efficiency; and

- visual aids at heliports, including helicopter stand markings and flight path alignment guidance lighting and marking to further enhance safety.

Aviation Medicine

Coordinated Global Responses to Public Health Emergencies

The number of people affected by public health events can be huge. In a pandemic that kills 100,000, a contribution to risk reduction by the aviation sector of just 1% would potentially save 1,000 lives — comparable to the potential number of fatalities from a large aircraft accident. Public health therefore continues to be worthy of attention by the aviation sector.

Public health risks that impact aviation are not confined to those related to communicable disease, as the 2011 Fukushima nuclear accident demonstrated. During this event in particular, there were several potential risks to air transport operations and to air travellers, including exposure of aircraft and passengers in flight to the radioactive plume, and the potential for a covering of radioactive material on an aircraft parked downwind from a power plant.

A reduction in passenger numbers of 80 per cent and 40 per cent to Hong Kong and Mexico, respectively, at the onset of the Severe Acute Respiratory Syndrome (SARS) outbreak and the Influenza A (H1N1) pandemic demonstrated that public health events can seriously impact air transport operations.

To address such public health and economic risks, several ICAO annexes and associated documents have been amended in recent years. These are:

- Annex 6—*Operation of Aircraft* (on board medical supplies)

- Annex 9—*Facilitation* (requirement for States to establish a national aviation plan in preparation for an outbreak of a communicable disease posing a public health risk or public health emergency of international concern)

- Annex 11—*Air Traffic Services* (contingency planning for public health emergencies)

- Annex 14—*Aerodromes* (emergency planning for public health emergencies)

- Doc 4444—*Procedures for Air Navigation Services— Air Traffic Management* (communication procedure for notifying a suspected public health event discovered on board an aircraft in flight to the public health authority at destination)

- Doc 9284—*Technical Instructions for the Safe Transport of Dangerous Goods by Air* (special management of persons who have been exposed to radioactive material and who need to be transported by air for medical treatment)

The ICAO Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA) has been established to reduce public health risks and to mitigate adverse economic effects of public health events. It comprises five separate but harmonized regional projects that bring all stakeholders together. So far, 93 States have joined CAPSCA regional projects. Harmonized guidelines concerning implementation of relevant SARPs have been developed and can be accessed from the CAPSCA website www.capsca.org.

CAPSCA provides regional meetings, training of aviation and public health personnel, and assistance visits to individual States and international airports. So far 54 assistance visits have been completed. Such activities assist States to implement relevant SARPs and procedures, many of which are addressed in protocol questions of the Universal Safety Oversight Audit Programme, Continuous Monitoring Approach. Subject to funding beyond 2013, it is intended that CAPSCA will continue to develop and expand into all areas relating to public health risks, including biological (including bioterrorism), chemical and nuclear risks.

PUBLIC HEALTH RISKS THAT
IMPACT AVIATION ARE NOT
CONFINED TO THOSE RELATED
TO COMMUNICABLE DISEASE.

Appendix I

Analysis of Accidents–Scheduled Commercial Air Transport

This Appendix provides a detailed analysis of accidents occurring during 2012, as well as a review of accidents over the past seven years. The data used in the analyses are for operations involving aircraft providing scheduled commercial air transport having a maximum take-off weight exceeding 2250 kg. In 2012, high-risk accident categories accounted for less than 50 per cent of accidents, fatal accidents and fatalities.

High-risk Accident Occurrence Categories

Based on an analysis of accident data covering the 2006–2011 time period, ICAO identified three high-risk accident occurrence categories:

- runway safety-related events[4]
- loss of control in-flight (LOC-I)
- controlled flight into terrain (CFIT)

As indicated in the first chart below, these three categories represented 63 per cent of the total number of accidents, 69 per cent of fatal accidents and 66 per cent of all fatalities between 2006 and 2011.

FIGURE 12: Distribution of High-risk Accidents: 2006–2011
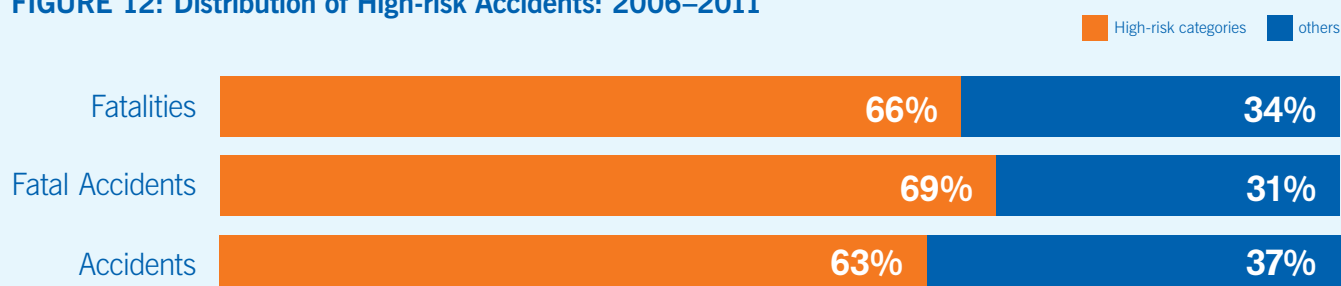
High-risk categories · others

	High-risk categories	others
Fatalities	66%	34%
Fatal Accidents	69%	31%
Accidents	63%	37%

In 2012, high-risk accident categories accounted for less than 50 per cent of accidents, fatal accidents and fatalities.

FIGURE 13: Distribution of High-risk Accidents: 2012

High-risk categories · others

	High-risk categories	others
Fatalities	45%	55%
Fatal Accidents	44%	56%
Accidents	47%	53%

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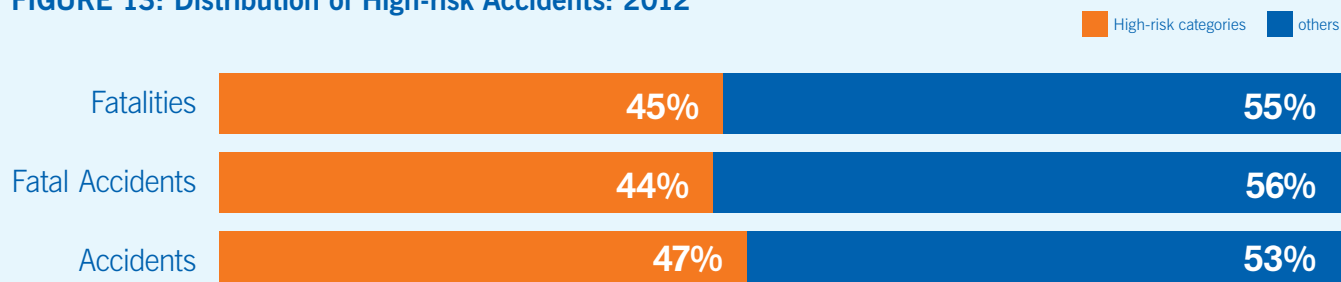
4   Runway safety-related events include the following ICAO accident occurrence categories: Abnormal Runway Contact, Bird Strike, Ground Collision, Ground Handling, Runway Excursion, Runway Incursion, Loss of Control on Ground, Collision with Obstacle(s), Undershoot / Overshoot and Aerodrome.

The following charts provide a comparison of the distribution of accidents, fatal accidents and fatalities related to the three high-risk occurrence categories during the baseline 2006–2011 period and 2012. Runway safety-related accidents accounted for the majority of all accidents during the 2006–2011 period, as well as 18 per cent of all fatalities.

FIGURE 14: Percentage of All Accidents: 2006–2011
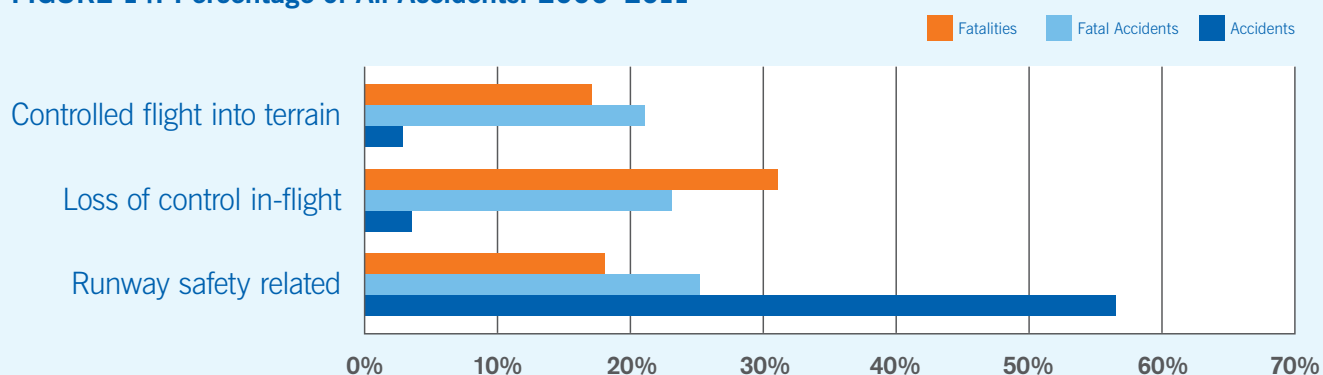
Notable observations from 2012 accidents include:

- The percentage of runway safety-related accidents was reduced significantly, representing 43 per cent of all accidents, accounting for only 11 per cent of all fatal accidents and one per cent of all related fatalities— a major decrease from the 2006–2011 baseline period.

- While the loss of control in-flight occurrence category represented only one per cent of all accidents, this category is of significant concern as it accounts for 11 per cent of all fatal accidents and eight per cent of all fatalities.

- Accidents related to controlled flight into terrain accounted for only three per cent of all accidents but represented 22 per cent of all fatal accidents and 37 per cent of fatalities (a major increase from the baseline).

FIGURE 15: Percentage of All Accidents: 2012
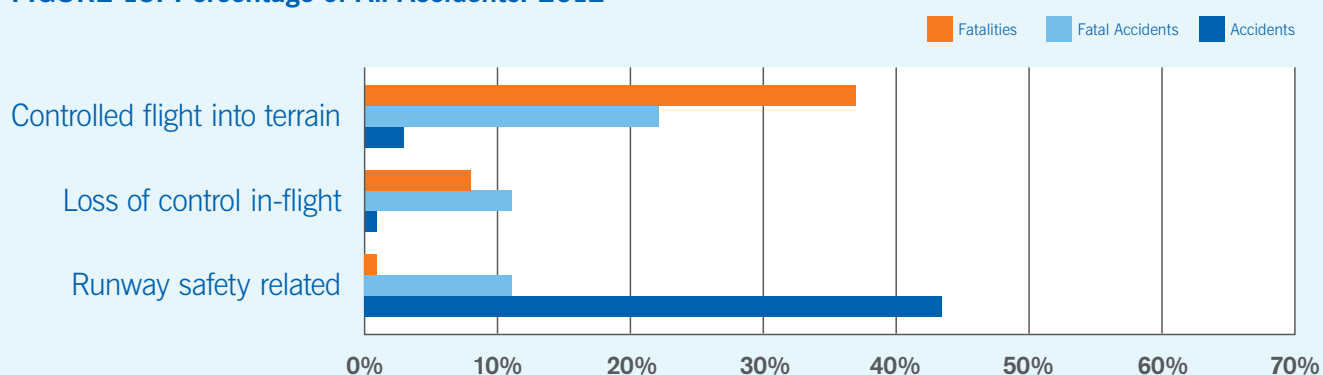
The previous charts show that CFIT accidents represent a small fraction of total accidents but are responsible for a large percentage of total fatalities. ICAO has been working with available terrain data and developing new means of visualizing traditional obstacle clearance data. An example of the capabilities ICAO is developing to enhance its analysis of CFIT risks can be seen below. The figure shows topographic information surrounding a major airport.

(Altitude in meters MSL)
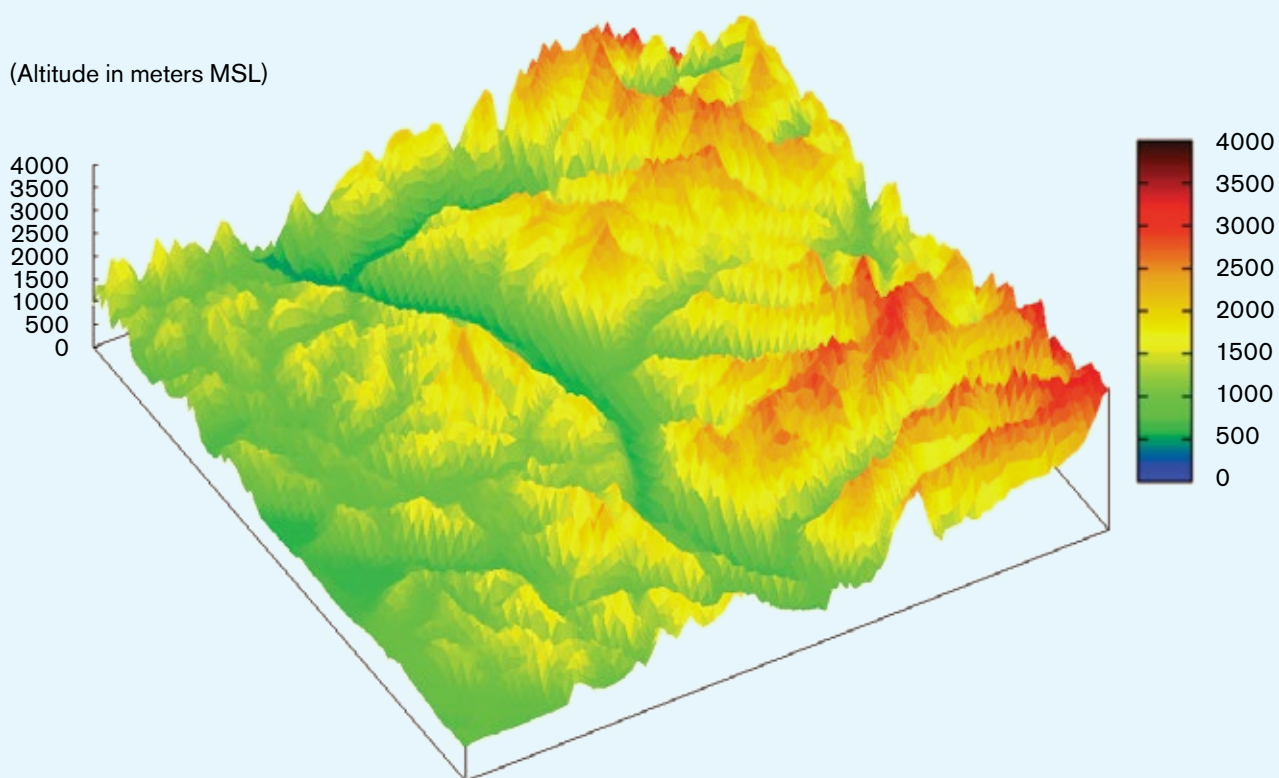
2006–2012 Accident Trends

The chart below shows the number of total and fatal accidents on commercial scheduled flights during the 2006–2012 period.

FIGURE 16: Accident Trends: 2006–2012

■ Accidents ■ Fatal Accidents
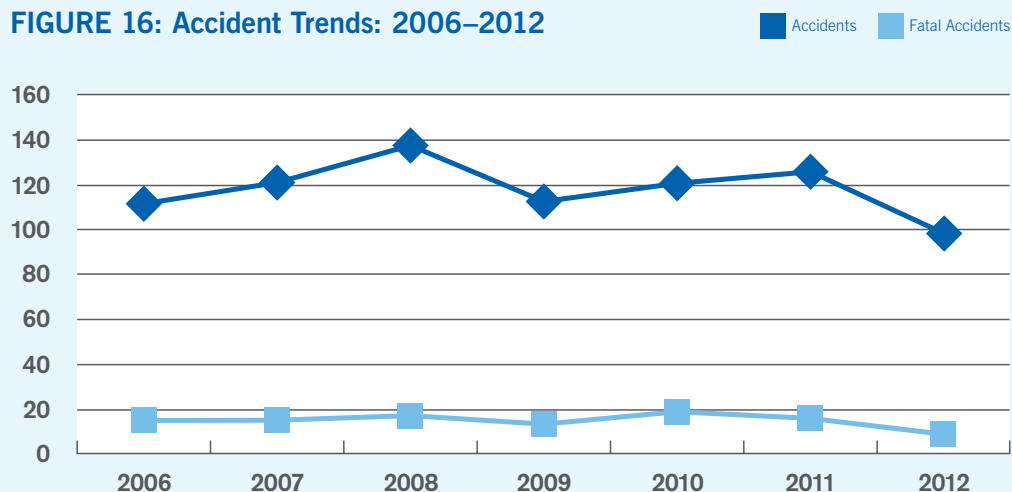
The number of accidents experienced annually was generally stable from 2006 to 2011, varying between 110 and 120 per year, resulting in an equivalently stable accident rate of approximately four accidents per million departures until 2011. There was a significant decrease in these figures in 2012.

2012 experienced a 21 per cent year-over-year decrease in the total number of accidents in scheduled commercial air transport compared to 2011, while traffic increased marginally (approximately one per cent) during the same period. As a result, the 2012 accident rate decreased to 3.2 accidents per million departures.

The chart below shows the number of fatalities associated with the above-mentioned fatal accidents.

FIGURE 17: Fatality Trends: 2006–2012
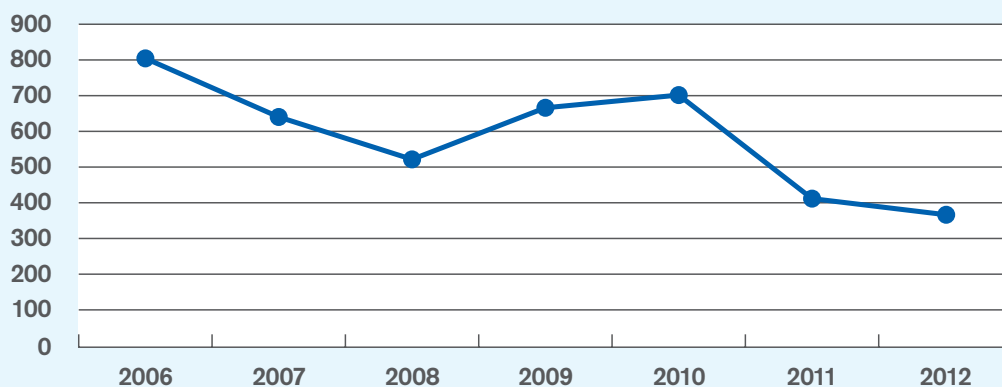
2013 Preliminary Accident Statistics

Information for 2013 accidents is extremely limited at this time, as official reports for recent accidents have not yet been fully submitted. Furthermore, some serious incidents may have their status changed to accidents at a later stage of ongoing investigations. Therefore, the following information is preliminary and meant to provide an early indication of the 2013 safety results.

The number of scheduled commercial accidents during the first six months of 2013 by UN region is shown below. Thirty-six (36) scheduled commercial accidents were known as of the date of publication, of which two were fatal resulting in 26 known fatalities. It is premature to begin the classification process for these accidents, as the Safety Indicators Study Group, the ICAO expert group responsible for accident classification, will only meet in February of 2014.

FIGURE 18: 2013 Preliminary Accidents by UN Region
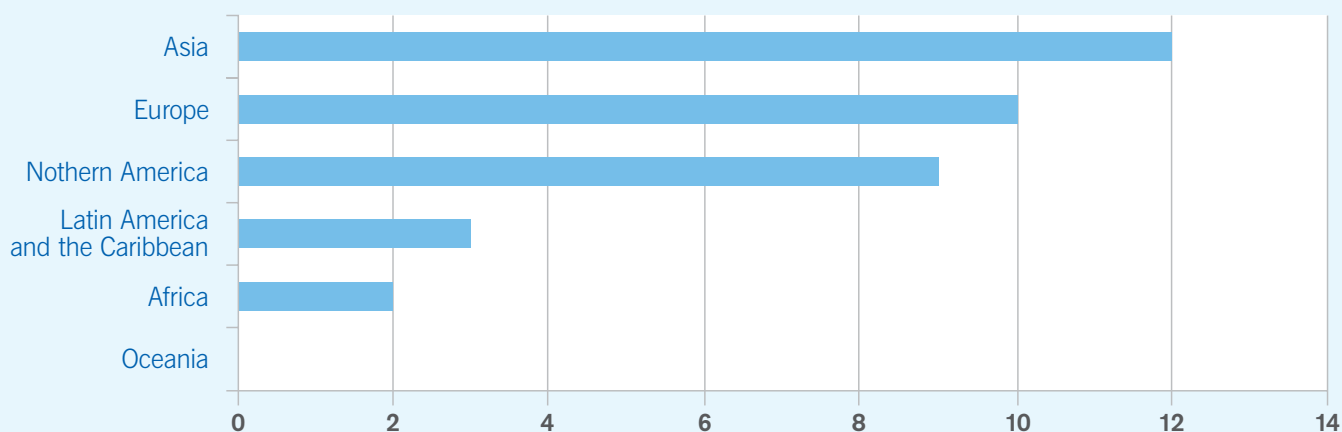
Appendix II

List of 2012 Accidents

Date	AC Type	State of Occurrence	UN Region	Fatalities	Accident Category
2012-01-04	McDonnell Douglas MD-80	Venezuela (Bolivarian Republic of)	Latin America and the Caribbean		RS
2012-01-06	ATR 42	Brazil	Latin America and the Caribbean		OTH
2012-01-07	Xian MA-60	Indonesia	Asia		RS
2012-01-09	Xian MA-60	Bolivia	Latin America and the Caribbean		SCF
2012-01-16	De Havilland DHC8	United Kingdom	Europe		RS
2012-01-16	De Havilland DHC8	United States	Northern America		RS
2012-01-24	McDonnell Douglas MD-80	Afghanistan	Asia		UNK
2012-02-02	Antonov An-124	United States	Northern America		TURB
2012-02-03	Bombardier CL-600	United States of America	Northern America		RS
2012-02-07	Airbus A340	Brazil	Latin America and the Caribbean		TURB
2012-02-09	Boeing 737	Venezuela (Bolivarian Republic of)	Latin America and the Caribbean		OTH
2012-02-11	Boeing 737	Germany	Europe		RS
2012-02-12	De Havilland DHC8	Canada	Northern America		RS
2012-02-13	Saab 2000	Romania	Europe		RS
2012-02-14	Airbus A319	United Kingdom	Europe		RS
2012-02-15	Bombardier CL-600	Germany	Europe		UNK
2012-02-17	ATR 72-500	Myanmar	Asia		RS
2012-02-18	Boeing 737	United States	Northern America		TURB
2012-02-23	Boeing 737	United States	Northern America		TURB
2012-02-24	Airbus A321	United States	Northern America		TURB
2012-02-26	Boeing 767	United States	Northern America		TURB
2012-03-08	British Aerospace Jetstream 31	United Kingdom	Europe		SCF
2012-03-09	ATR 42	Pakistan	Asia		SCF
2012-03-17	Raytheon Beechcraft 1900	Canada	Northern America		RS
2012-03-20	Boeing 737	United States	Northern America		TURB
2012-03-29	Boeing 737	Norway	Europe		UNK

List of 2012 Accidents (continued)

Date	AC Type	State of Occurrence	UN Region	Fatalities	Accident Category
2012-03-29	Fokker 50	Sudan	Africa		RS
2012-03-30	Fokker 50	Mongolia	Asia		RS
2012-03-31	Boeing 777	Japan	Asia		RS
2012-04-02	ATR 72	Russian Federation	Europe	31	LOC-I
2012-04-07	De Havilland DHC8	United States	Northern America		RS
2012-04-09	De Havilland DHC8	United Republic of Tanzania	Africa		RS
2012-04-14	Airbus A300	United Kingdom	Europe		UNK
2012-04-14	Boeing 737	France	Europe		RS
2012-04-14	Airbus A319	United States	Northern America		TURB
2012-04-19	BAe-146	Sweden	Europe		SCF
2012-04-20	Boeing 737	Pakistan	Asia	127	CFIT
2012-04-22	Boeing 737	Pakistan	Asia		SCF
2012-05-02	Raytheon Beechcraft 1900	Canada	Northern America		RS
2012-05-08	Boeing 737	Sweden	Europe		OTH
2012-05-10	Airbus A319	United States	Northern America		TURB
2012-05-11	Convair CV-440	Guatemala	Latin America and the Caribbean		RS
2012-05-13	ATR 72	Ireland	Europe		RS
2012-05-14	Dornier 228	Nepal	Asia	15	UNK
2012-05-14	Airbus A319	United Kingdom	Europe		RS
2012-05-17	ATR 72	Germany	Europe		SCF
2012-05-26	De Havilland DHC8	United Kingdom	Europe		RS
2012-05-28	Saab 2000	Italy	Europe		SCF
2012-05-29	British Aerospace Jetstream 31	United Kingdom	Europe		SCF
2012-05-30	Boeing 747	United States	Northern America		RS
2012-05-30	Airbus A320	United Kingdom	Europe		RS
2012-05-30	Embraer ERJ-135	United States	Northern America		RS
2012-06-01	Boeing 737	Indonesia	Asia		RS
2012-06-02	Boeing 727-200	Ghana	Africa		UNK
2012-06-03	McDonnell Douglas MD-83	Nigeria	Africa	163	UNK
2012-06-06	Fairchild Swearingen SA227 Metro III	Uruguay	Latin America and the Caribbean	2	UNK
2012-06-07	Boeing 757	United States	Northern America		TURB

Date	AC Type	State of Occurrence	UN Region	Fatalities	Accident Category
2012-06-10	Airbus A320	United States	Northern America		TURB
2012-06-16	ATR 42	United Kingdom	Europe		RS
2012-06-20	Boeing 767	Japan	Asia		RS
2012-07-05	Boeing 737	Germany	Europe		TURB
2012-07-05	Boeing 747	Japan	Asia		TURB
2012-07-05	Boeing 777	Japan	Asia		TURB
2012-07-18	Boeing 707	Chile	Latin America and the Caribbean		RS
2012-07-18	Bombardier CRJ	United States	Northern America		SCF
2012-08-05	Embraer EMB-170	United States	Northern America		TURB
2012-08-06	Boeing 777	Chile	Latin America and the Caribbean		TURB
2012-08-10	De Havilland DHC8	United States	Northern America		RS
2012-08-21	Airbus A330	Japan	Asia		TURB
2012-08-22	Let 410	Kenya	Africa	4	UNK
2012-08-31	ATR 42	Pakistan	Asia		RS
2012-09-06	Bombardier CRJ	Spain	Europe		RS
2012-09-07	Airbus A320	Ireland	Europe		OTH
2012-09-10	De Havilland DHC8	Canada	Northern America		RS
2012-09-12	Antonov AN-26	Russian Federation	Europe	10	RS
2012-09-12	Antonov AN-28	Russian Federation	Europe		CFIT
2012-09-13	Boeing 767	Brazil	Latin America and the Caribbean		SCF
2012-09-18	Airbus A330	United States	Northern America		TURB
2012-09-20	Airbus A320	Syrian Arab Republic	Asia		OTH
2012-09-28	Dornier 228	Nepal	Asia	19	SCF
2012-09-30	Boeing 777	Italy	Europe		RS
2012-10-04	Boeing 717	United States	Northern America		RS
2012-10-13	McDonnell Douglas MD-11	Brazil	Latin America and the Caribbean		SCF
2012-10-14	Boeing 737	Turkey	Asia		F-NI
2012-10-15	De Havilland DHC8	Canada	Northern America		RS
2012-10-16	Bombardier CRJ	France	Europe		RS
2012-10-16	Boeing 737	United States	Northern America		OTH

List of 2012 Accidents (continued)

Date	AC Type	State of Occurrence	UN Region	Fatalities	Accident Category
2012-10-19	Boeing 737	United Kingdom	Europe		F-NI
2012-10-19	Boeing 737	Indonesia	Asia		RS
2012-10-23	Shorts 360	Israel	Asia		SCF
2012-11-11	Airbus A320	Italy	Europe	1	RS
2012-11-16	Airbus A300	Slovakia	Europe		SCF
2012-11-26	Boeing 767	Japan	Asia		TURB
2012-12-05	Bombardier CRJ	United States	Northern America		OTH
2012-12-14	ATR-72	Indonesia	Asia		RS
2012-12-25	Fokker 100	Myanmar	Asia		CFIT
2012-12-26	McDonnell Douglas MD-11	United States	Northern America		RS
2012-12-28	Embraer ERJ-145	United States	Northern America		OTH
2012-12-31	British Aerospace Jetstream 31	Honduras	Latin America and the Caribbean		RS

Accident Categories

Code	Description
CFIT	Controlled flight into/towards terrain
RS	Runway safety-related
LOC-I	Loss of control in-flight
F-NI	Fire – non-impact
TURB	Turbulence encounter
OTH	Other
UNK	Unknown
SCF	System component failure

Appendix III

List of 2013 Accidents

Date	AC Type	State of Occurrence	UN Region	Fatalities
13-01-02	Saab 340	Argentina	Latin America and the Caribbean	
13-01-17	Airbus A340	United States of America	Northern America	
13-01-17	Boeing 777	United States of America	Northern America	
13-01-25	Airbus A321	Russian Federation	Europe	
13-01-29	Bombardier (Canadair) CRJ	Kazakhstan	Asia	21
13-02-02	ATR 72	Italy	Europe	
13-02-06	Airbus A320	Tunisia	Africa	
13-02-09	Beechcraft 1900	Canada	Northern America	
13-02-11	Boeing 737	Oman	Asia	
13-02-13	Antonov An-24	Ukraine	Europe	5
13-03-05	Airbus A330	United States of America	Northern America	
13-03-05	ATR 72	France	Europe	
13-03-05	Embraer EMB-120	South Africa	Africa	
13-03-29	Airbus A321	France	Europe	
13-04-05	Airbus A321	United States of America	Northern America	
13-04-05	Boeing 737	Indonesia	Asia	
13-04-13	Airbus A330	Brazil	Latin America and the Caribbean	
13-04-13	Boeing 737	Indonesia	Asia	
13-04-16	Airbus A321	Republic of Korea	Asia	
13-04-16	Boeing 767	Spain	Europe	
13-04-28	Boeing 777	Saudi Arabia	Asia	
13-04-28	Bombardier Dash 8	Canada	Northern America	
13-05-01	Embraer ERJ-145	United States of America	Northern America	
13-05-16	Xian MA-60	Myanmar	Asia	
13-05-18	Bombardier Dash 8	United States of America	Northern America	
13-05-23	ATR 72	United Kingdom of Great Britain and Northern Ireland	Europe	
13-05-24	Airbus A319	United Kingdom of Great Britain and Northern Ireland	Europe	
13-05-24	Airbus A320	Bulgaria	Europe	

List of 2013 Accidents (continued)

Date	AC Type	State of Occurrence	UN Region	Fatalities
13-05-26	Bombardier Dash 8	Canada	Northern America	
13-06-01	Fairchild Dornier Do-228	Nepal	Asia	
13-06-02	Airbus A320	Philippines	Asia	
13-06-07	Embraer ERJ-145	China	Asia	
13-06-08	Airbus A320	Italy	Europe	
13-06-10	Xian MA-60	Indonesia	Asia	
13-06-10	Xian MA-60	Myanmar	Asia	
13-06-13	Saab 340	Bahamas	Latin America and the Caribbean	

Appendix IV

States by UN Region

Africa	Asia	Europe	Latin America and the Caribbean	Northern America
Algeria	Afghanistan	Åland Islands	Anguilla	Bermuda
Angola	Armenia	Albania	Antigua and Barbuda	Canada
Benin	Azerbaijan	Andorra	Argentina	Greenland
Botswana	Bahrain	Austria	Aruba	Saint Pierre and Miquelon
Burkina Faso	Bangladesh	Belarus	Bahamas	United States of America
Burundi	Bhutan	Belgium	Barbados	
Cameroon	Brunei Darussalam	Bosnia and Herzegovina	Belize	
Cape Verde	Cambodia		Bolivia (Plurinational State of)	**Oceania**
Central African Republic	China	Bulgaria	Bonaire, Saint Eustatius and Saba	American Samoa
Chad	China, Hong Kong Special Administrative Region	Channel Islands	Brazil	Australia
Comoros		Croatia	British Virgin Islands	Cook Islands
Congo	China, Macao Special Administrative Region	Czech Republic	Cayman Islands	Fiji
Cote d'Ivoire	Cyprus	Denmark	Chile	French Polynesia
Democratic Republic of the Congo	Democratic People's Republic of Korea	Estonia	Colombia	Guam
Djibouti	Georgia	Faeroe Islands	Costa Rica	Kiribati
Egypt	India	Finland	Cuba	Marshall Islands
Equatorial Guinea	Indonesia	France	Curaçao	Micronesia (Federated States of)
Eritrea	Iran (Islamic Republic of)	Germany	Dominica	Nauru
Ethiopia	Iraq	Gibraltar	Dominican Republic	New Caledonia
Gabon	Israel	Greece	Ecuador	New Zealand
Gambia	Japan	Guernsey	El Salvador	Niue
Ghana	Jordan	Holy See	Falkland Islands (Malvinas)	Norfolk Island
Guinea	Kazakhstan	Hungary	French Guiana	Northern Mariana Islands
Guinea-Bissau	Kuwait	Iceland	Grenada	Palau
Kenya	Kyrgyzstan	Ireland	Guadeloupe	Papua New Guinea
Lesotho	Lao People's Democratic Republic	Isle of Man	Guatemala	Pitcairn
Liberia	Lebanon	Italy	Guyana	Samoa
Libya	Malaysia	Jersey	Haiti	Solomon Islands
Madagascar	Maldives	Latvia	Honduras	Tokelau
Malawi		Liechtenstein	Jamaica	Tonga
Mali		Lithuania		
		Luxembourg		
		Malta		

States by UN Region (continued)

Africa	Asia	Europe	Latin America and the Caribbean	Oceania
Mauritania	Mongolia	Monaco	Martinique	Tuvalu
Mauritius	Myanmar	Montenegro	Mexico	Vanuatu
Mayotte	Nepal	Netherlands	Montserrat	Wallis and Futuna
Morocco	Oman	Norway	Nicaragua	Islands
Mozambique	Pakistan	Poland	Panama	
Namibia	Philippines	Portugal	Paraguay	
Niger	Qatar	Republic of Moldova	Peru	
Nigeria	Republic of Korea	Romania	Puerto Rico	
Réunion	Saudi Arabia	Russian Federation	Saint Kitts and Nevis	
Rwanda	Singapore	San Marino	Saint Lucia	
Saint Helena	Sri Lanka	Sark	Saint Martin (French part)	
Sao Tome and Principe	State of Palestine	Serbia	Saint Vincent and the Grenadines	
Senegal	Syrian Arab Republic	Slovakia	Saint-Barthélemy	
Seychelles	Tajikistan	Slovenia		
Sierra Leone	Thailand	Spain	Sint Maarten (Dutch part)	
Somalia	Timor-Leste	Svalbard and Jan Mayen Islands	Suriname	
South Africa	Turkey	Sweden	Trinidad and Tobago	
South Sudan	Turkmenistan	Switzerland	Turks and Caicos Islands	
Sudan	United Arab Emirates	The former Yugoslav Republic of Macedonia	United States Virgin Islands	
Swaziland	Uzbekistan	Ukraine	Uruguay	
Togo	Viet Nam	United Kingdom of Great Britain and Northern Ireland	Venezuela (Bolivarian Republic of)	
Tunisia	Yemen			
Uganda				
United Republic of Tanzania				
Western Sahara				
Zambia				
Zimbabwe				

Appendix V

States by RASG

RASG-AFI	RASG-APAC	RASG-EUR	RASG-MID	RASG-Pan America
Angola	Afghanistan	Albania	Bahrain	Anguilla (U.K.)
Benin	American Samoa (U.S.A.)	Algeria	Egypt	Antigua and Barbuda
Botswana	Australia	Armenia	Iraq	Argentina
Burkina Faso	Bangladesh	Austria	Islamic Republic of Iran	Aruba (Neth.)
Burundi	Bhutan	Azerbaijan	Jordan	Bahamas
Cameroon	Brunei Darussalam	Belarus	Kuwait	Barbados
Cape Verde	Cambodia	Belgium	Lebanon	Belize
Central African Republic	China	Bosnia and Herzegovina	Libyan Arab Jamahiriya	Bermuda (U.K.)
Chad	Cook Islands	Bulgaria	Oman	Bolivia
Comoros	Democratic People's Republic of Korea	Croatia	Qatar	Bonaire, Saint Eustatius and Saba
Congo	Democratic Republic of Timor-Leste	Cyprus	Saudi Arabia	Brazil
Côte d'Ívoire	Federated States of Micronesia	Czech Republic	Sudan	Canada
Democratic Republic of the Congo	Fiji	Denmark	Syrian Arab Republic	Cayman Islands (U.K.)
Djibouti	French Polynesia (Fr.)	Estonia	United Arab Emirates	Chile
Equatorial Guinea	Guam (U.S.A.)	Faroe Islands (Den.)	Yemen	Colombia
Eritrea	India	Finland		Costa Rica
Ethiopia	Indonesia	France		Cuba
Gabon	Japan	Georgia		Curaçao
Gambia	Kiribati	Germany		Dominica
Ghana	Lao People's Democratic Republic	Gibraltar (U.K.)		Dominican Republic
Guinea	Malaysia	Greece		Ecuador
Guinea-Bissau	Maldives	Greenland (Den.)		El Salvador
Île De La Réunion (Fr.)	Marshall Islands	Hungary		Falklan Islands (Malvinas)
Kenya	Mongolia	Iceland		French Guiana (Fr.)
Lesotho	Myanmar	Ireland		Grenada
Liberia	Nauru	Israel		Guadeloupe (Fr.)
Madagascar	Nepal	Italy		Guatemala
Malawi	New Caledonia (Fr.)	Kazakhstan		Guyana
Mali	New Zealand	Kyrgyzstan		Haiti
Mauritania		Latvia		Honduras
Mauritius		Lithuania		Jamaica
		Luxembourg		

States by RASG (continued)

RASG-AFI	RASG-APAC	RASG-EUR	RASG-MID	RASG-Pan America
Mayotte (Fr.)	Niue (NZ.)	Malta		Martinique (Fr.)
Mozambique	Norfolk Island (Austr.)	Monaco		Mexico
Namibia	Northern Mariana Islands (U.S.A.)	Montenegro		Montserrat (U.K.)
Niger	Pakistan	Morocco		Nicaragua
Nigeria	Palau	Netherlands		Panama
Rwanda	Papua New Guinea	Norway		Paraguay
Sao Tome and Principe	Philippines	Poland		Peru
Senegal	Republic of Korea	Portugal		Puerto Rico (U.S.A.)
Seychelles	Samoa	Republic of Moldova		Saint Kitts and Nevis
Sierra Leone	Singapore	Romania		Saint Lucia
Somalia	Solomon Islands	Russian Federation		Saint Vincent and the Grenadines
South Africa	Sri Lanka	Serbia		Sint Maarten (Dutch part)
South Sudan	Thailand	Slovakia		Suriname
Swaziland	Tonga	Slovenia		Trinidad and Tobago
Togo	Tuvalu	Spain		Turks and Caicos Islands (U.K.)
Uganda	Vanuatu	Sweden		United States
United Republic of Tanzania	Viet Nam	Switzerland		Uruguay
Zambia	Wallis Is. (Fr.)	Tajikistan		Venezuela
Zimbabwe		The former Yugoslav Republic of Macedonia		Virgin Islands (U.S.A.)
		Tunisia		
		Turkey		
		Turkmenistan		
		Ukraine		
		United Kingdom		
		Uzbekistan		

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