International Civil Aviation Organization

Second Meeting of the RASG-MID Steering Committee (RSC/2)

(Amman, Jordan, 28 – 30 October 2013)

Agenda Item 3: Regional Performance Framework for Safety

REVIEW OF THE DRAFT OF THE SECOND ANNUAL SAFETY REPORT

(Presented by the Rapporteur of the MID-ASRT)

SUMMARY

This paper presents the Draft of the Second Edition of the Annual Safety Report with the analysis of the accidents and incidents data, and identification of risk areas contributing to be addressed within the framework of RASG-MID.

Action by the meeting is at paragraph 3.

1. INTRODUCTION

1.1 The MID Annual Safety Report Team (MID-ASRT) was established through Decision 1/3 of the Regional Aviation Safety Group (RASG-MID/1) Meeting which was held in September 2011.

1.2 The MID-ASRT was established with the purpose of gathering safety information from different available sources to determine the main aviation safety risks in the Middle East Region, and issue the Annual Safety Report.

2. DISCUSSION

2.1 The objective of the RASG-MID Annual Safety Report is **to gather safety information** from different stakeholders and **to identify the main aviation safety risks** in the Middle East Region in order to deploy mitigation actions for enhancing aviation safety in a coordinated manner.

2.2 The Second Edition of the Annual Safety Report focuses on proactive safety data analysis and includes additional focus areas to the previous edition the report developed in 2012.

2.3 The Draft of the Second Edition of the Annual Safety Report is at **Appendix A** to this working paper.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and endorse the Draft Annual Safety Report at **Appendix A** to this working paper; and

b) urge States and stakeholders to provide necessary safety data to the MID-ASRT for the Final Version of the Annual Safety Report.

APPENDIX A

RASG-MID Annual Safety Report – Second Edition

Second Edition, October 2013
Regional Aviation Safety Group – Middle East (RASG-MID)

RASG-MID

Annual Safety Report

Table of contents

Forward

Regional Aviation Safety Group – Middle East (RASG-MID)

Background

Improving the safety of the Global Air Transport System is ICAO's guiding and most fundamental Strategic Objective. In all of its coordinated safety activities, ICAO strives to achieve a balance between identified and assessed risk and the requirements of practical and achievable mitigation strategies.

On 25 May 2010, the ICAO Council approved the establishment of the following Regional Aviation Safety Groups: RASG-PA for the Caribbean, South American, and North American regions (including Central America); RASG-EUR for the European region; RASG-APAC for the Asia Pacific regions; RASG-AFI for the African region and RASG-MID for the Middle East region, with the aim of supporting a regional performance framework for the management of safety.

The first meeting of the Directors General of Civil Aviation-Middle East (DGCA-MID/1) meeting held in Abu Dhabi, UAE from 22 to 24 March 2011 agreed to the establishment of the Regional Aviation Safety Group – Middle East (RASG-MID). Subsequently, the first RASG-MID meeting took place in Cairo, Egypt, 18-19 September 2011.

The Main objectives of RASG-MID are to support the:

a) implementation of the Global Aviation Safety Plan (GASP) and the associated Global Aviation Safety Roadmap (GASR) in the MID Region by ensuring effective coordination and cooperation between all stakeholders and monitoring progress in the implementation of the GASP and GASR; and

b) establishment and operation of a performance-based safety system for the Region, using the GASP and GASR, and building on the work already done by States and regional organizations.

Organizational Structure

RASG-MID membership includes representatives from MID States (those States whose territories are located within the area of accreditation of the ICAO Middle East Regional Office; i.e.: Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE and Yemen). Other Contracting States and non-Contracting States are entitled to participate in the RASG-MID meetings as observers.

The list of permanent observers to the RASG-MID is detailed in its Terms of Reference. They represent the aircraft operators, international organizations, maintenance and repair organizations, regional and sub-regional organizations, training organizations, aircraft manufactures, airport and air navigation service providers, etc.

The RASG-MID is administered by:

a) a Chairperson and a First Vice-Chairperson elected from the Representatives designated by Member States of the Group; and by a Second Vice-Chairperson elected from the partners.
b) the ICAO Regional Director, Cairo who serves as Secretary. In the execution of his duties the Secretary will be supported by appropriate Experts from the ICAO MID Regional Office and ICAO HQ, as required.

The current Chairperson and First Vice-Chairperson are from UAE and Oman, respectively. The Second Vice-Chairperson is from the International Air Transport Association (IATA).

A RASG-MID Steering Committee (RSC) composed of representatives from States, international/regional organizations and industry has been established to act as an advisory body to the RASG-MID, guide its work and ensure that safety initiatives are accomplished in a timely, effective and efficient manner.

The RSC is chaired by two Co-Chairpersons representing States and international organizations/industry (Partners). An Alternate from the member States and another Alternate from the Partners have been elected to replace the Co-Chairperson(s), in case of absence.

The current Co-Chairpersons are from Lebanon and Boeing, respectively; and the Alternates are from Jordan and the International Federation of Airline Pilots' Associations (IFALPA).

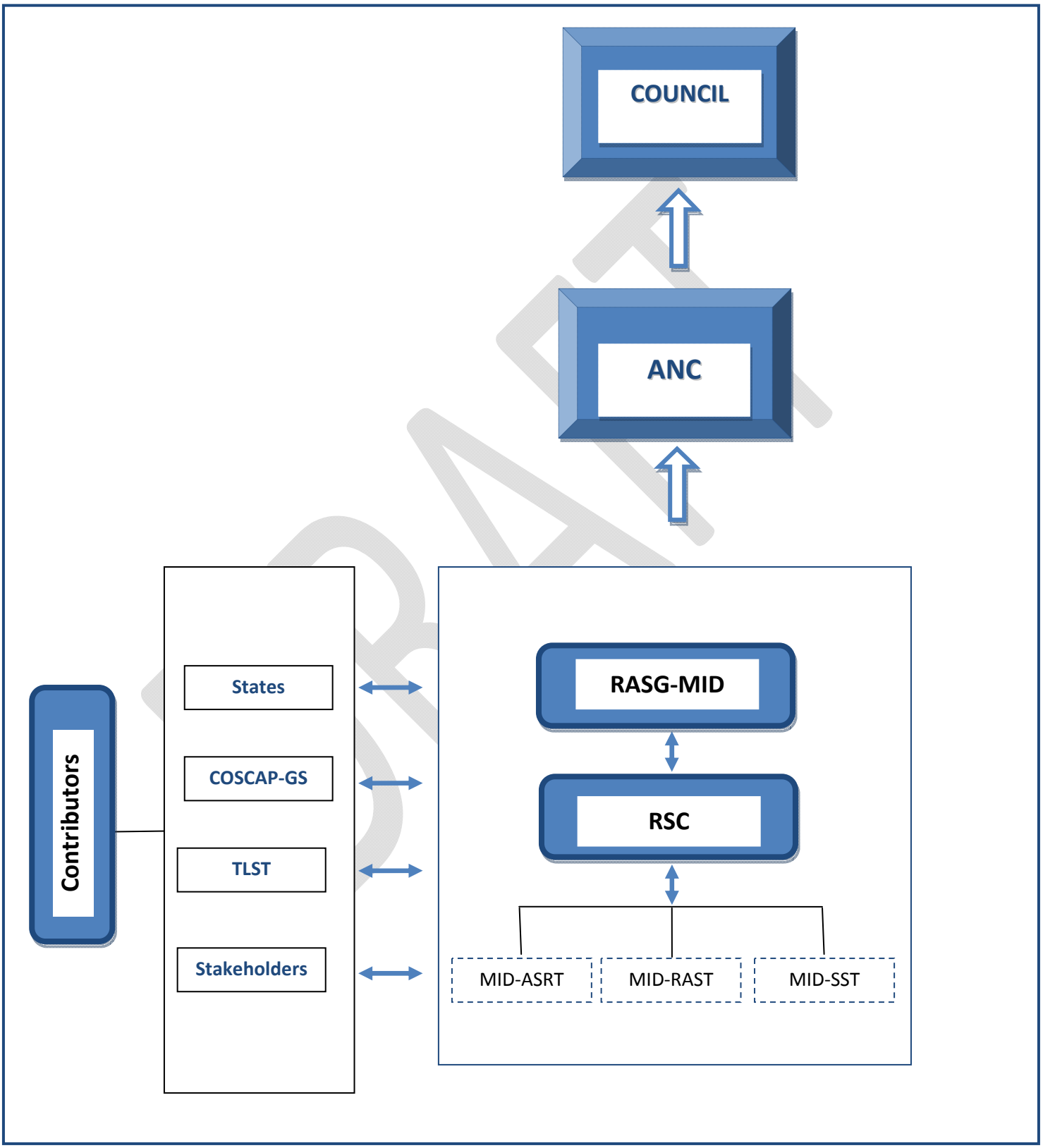
In addition to the RSC Co-Chairpersons and Alternates, the RSC membership includes also the RASG-MID Chairperson and Vice-Chairpersons, the RASG-MID Members/Alternates from Bahrain, Egypt, Jordan, Iran, Oman, Qatar, Saudi Arabia and UAE; and RASG-MID Representatives/Alternates from AACO, ACAC, ACI, BOEING, COSCAP-GS, FSF, IATA, IFALPA, MEASR-TLST and WFP (UN).

RASG-MID subsidiary bodies (Safety Teams) are established, as required, to assist the RASG-MID in its work and support the development, implementation and prioritization of RASG-MID safety initiatives. The Safety Teams operate in coordination with and under the guidance of the RSC. They should accomplish their tasks by developing mitigation strategies based on gathering and processing safety data and information. The MID Annual Safety Report Team (MID-ASRT), the MID Regional Aviation Safety Team (MID-RAST), and the Safety Support Team (SST) have been established, so far.

The RASG-MID Organizational Structure is depicted in the following Figure:

RASG-MID

ORGANIZATIONAL STRUCTURE



Activities

Safety Enhancement Initiatives (SEIs): RASG-MID has performed an analysis of the three main risk areas based on MID regional data. As a result, various Safety Enhancement Initiatives (SEIs) are being developed to reduce the rate of fatal accidents for the three main risk areas, namely: Runway and Ground Safety (RGS), In-flight Damage (IFD) and Loss of Control In-Flight (LOC-I). To implement the SEIs, RASG-MID is developing Detailed Implementation Plans (DIPs) which are championed by the member States/organizations who have volunteered to lead the specific initiative based on their area of expertise.

2013 Annual Safety Report: The 2013 Annual Safety Report developed and published by RASG-MID, is the second Safety Report for the MID Region based on data provided by ICAO, Boeing and IATA. The second edition of the report provides more in-depth analysis of accidents and occurrences with proactive safety information provisions. The analysis of this aviation safety data was completed through in-kind contributions of aviation safety personnel from RASG-MID member and partners. This exclusive MID report, which has a consolidated vision of aviation safety using sources of information from regional stakeholders, is one of a kind in the region. This report is an annual publication providing updated yearly aviation safety information.

RASG-MID meeting reports, as well as other important material related to official activities of the group, can be downloaded at: http://www.icao.int/MID/Pages/rasgmid.aspx. For additional information contact: icaomid@cairo.icao.int

Summary

In the context of renewed growth of air traffic and in light of anticipated increases in air travel, it is imperative to maintain a very strong focus on initiatives that will further improve safety outcomes in the future. ICAO is therefore, continuously developing and refining more proactive and risk-based methods to further reduce the global accident rate, enabling the safe expansion of air travel worldwide.

RASG-MID has been established with the main objective of enhancing safety in the Middle East Region by reducing duplication of efforts, and reducing human and financial resource expenditure.

The success of RASG-MID is dependent on the commitment, participation and contributions of its members from States and industry alike through financial and in-kind support.

1. Introduction

The objective of the RASG-MID Annual Safety Report is **to gather safety information** from different stakeholders and **to identify the main aviation safety risks** in the Middle East Region in order to deploy mitigation actions for enhancing aviation safety in a coordinated manner.

Every entity involved in aviation safety collects safety data and produces safety information with a different perspective. To ensure that all safety efforts are properly coordinated, the region must first agree on the key risks areas.

The safety information presented in this report is based on the compilation and analysis of data provided by: Boeing, the International Air Transport Association (IATA), the International Civil Aviation Organization (ICAO), airline operators, and States.

This Second RASG-MID Annual Safety Report is intended to provide Member States and the aviation community with an in-depth analysis of the air transport safety trends and indicators in the MID Region, highlighting progress with regards to the set safety targets for the region under the MID Region Safety Strategy. It presents a snapshot of safety performance within the civil aviation system in the MID Region, while providing helpful information about the numerous efforts to develop collaborative responses to safety concerns at the National and Regional level.

It comprises three main sections, one for each safety information category:

1. **Reactive** Information
2. **Proactive** Information
3. **Predictive** Information

IATA and ICAO organized the first Middle East Safety Summit on 28-29 April 2013, under the auspices of RASG-MID. Within this Summit, the safety partners agreed on strategies that address the top aviation safety risk areas in the region, and developed a Regional Safety Strategy covering short-term, mid-term and long-term objectives and targets (2017, 2022 and 2027). The MID Region Safety Strategy includes safety objectives and safety performance metrics and indicators that will govern safety performance in the region.

The strategic safety objective for the MID Region is to **continuously improve aviation safety through a progressive reduction of the number of accidents and related fatalities in the MID Region to be in line with the global average, based on reactive, proactive and predictive safety management practices.**

The MID Region Safety Strategy sets safety objectives that are in line with the global safety objectives and address specific safety risks identified within the framework of the Middle East Regional Aviation Safety Group (RASG-MID), based on the analysis of available safety data under the Annual Safety Report.

In summary, the safety objectives for the MID Region are as follows;

Near-term Objective (2017):
In the near term, States will ensure that they have the resources as well as the legal, regulatory and organizational structures necessary to fulfill their safety oversight obligations and in collaboration with all stakeholders achieve the following near-term objectives:

- all MID States should establish an effective safety oversight system and progressively increase the USOAP-CMA Effective Implementation (EI) score with a baseline of 60% for all States by 2017, through, mainly the reinforcement of the entities responsible to carry out regulatory and safety oversight functions with qualified and trained technical staff, and/or the delegation of

certain safety oversight functions to a Regional Safety Oversight Organization (RSOO);

- reduce Runway Excursions and Incursions accidents in the MID Region by 50% by 2017, through establishment and activation of Runway Safety Teams (RST's), Aerodromes Certification, and implementation of Airport Safety Management System (SMS);

- reduce In-flight Damage accidents in the MID Region by 50% by 2017, through the development of regional guidance, and conducting awareness training;

- reduce Loss Of Control In-flight (LOC-I) related accidents in the MID Region by 50% by 2017, through appropriate Standard Operating Procedures (SOPs) related to mode awareness and energy state management, and Advance Manoeuvers Training;

- maintain the rate of Controlled Flight Into Terrain related accidents in the MID Region below the global rate, through pilot training, use of Fatigue Risk Management Systems (FRMS) framework, and implementation of PBN; and

- States with an effective safety oversight score (EI) over 60% proceed to fully implement SSP following a phased approach supported by high-level management with the availability of necessary resources and safety promotion through the provision of appropriate training, communication and dissemination of safety information and improvement of the safety culture.

Mid-term Objective (2022):

The mid-term objective is to achieve full implementation of State Safety Programme (SSP) by States and Safety Management Systems (SMS) by concerned service providers (namely air navigation service providers, airlines, airports and other aviation stakeholders) to facilitate the proactive management of safety risks. The mid-term objective therefore represents the evolution from a purely compliance-based oversight approach to one which proactively manages risks through the identification and control of existing or emerging safety issues. In addition, service providers will strive to gain safety benefits from the common implementation of the different modules of the Aviation System Block Upgrades (ASBUs). The target implementation date for the mid-term objective is 2022.

Long-term Objective (2027):

The focus of the long-term objective is the implementation of proactive and predictive systems that ensure safety in a real-time, collaborative decision-making environment. Sustainable growth of the international aviation system will require the introduction of advanced safety capabilities (e.g. full trajectory-based operations) that increase capacity while maintaining or enhancing operational safety margins and manage existing and emerging risks. The long-term safety objective is intended to support a collaborative decision making environment characterized by increased automation and the integration of advanced technologies on the ground and in the air, as contained in ICAO's Aviation System Block Upgrades (ASBUs) strategy. The target implementation date for the long-term objectives is 2027.

The monitoring of safety performance and its enhancement for the MID region will be achieved through the Safety Metrics and Indicators identified under the MID Region Safety Strategy, as well as the adoption and attainment of Aviation safety Targets.

The following are the MID Region Safety Metrics endorsed for the monitoring of safety performance:

1) Accidents and serious incidents;
2) Runway and Ground Safety (RGS);
3) In-Flight Damage (IFD)
4) Loss of Control In-Flight (LOC-I);
5) Controlled Flight Into Terrain (CFIT);
6) Safety oversight capabilities (USOAP-CMA, IOSA and ISAGO);

7) Aerodrome Certification; and
8) SSP/SMS Implementation.

The Annual Safety Report will highlight safety performance in addition to analysis of safety data and trends. The MID Region Safety Indicators and Safety Targets that will be referred to in this report are attached to this report as an Appendix.

2. Safety Information and Analysis

Information is the input of any safety management process; hazards can be identified through processing and analysis by these means, after hazards are identified the associated risk and consequences will be assessed and recommended mitigation actions will be provided to decision-makers for the final decision to implement and allocate resources.

RASG-MID can be viewed as a regional safety management process or a regional safety program (RSP) in the same way a State Safety Program (SSP) is a national safety management process and a Safety Management System is a service provider's safety management program.

The following sections show the results of safety information analysis gathered by different stakeholders and grouped as reactive, proactive and predictive safety information.

2.1 Reactive Safety Information

ICAO established a reduction in the **number of fatal accidents and fatalities** worldwide as Safety Targets for 2008-2011[1] irrespective of the volume of air traffic to achieve a significant decrease in accident rates particularly for regions where those numbers remain high and to reduce regional accident rates so that no region has a rate above twice the worldwide rate by the end of 2011.

The MID Region adopted safety target is to progressively reduce the accident rate to be in line with the global average by the end of 2017.

The process followed by the Annual Safety Report Team (ASRT) to analyze reactive information consisted of retrieving safety data from IATA, ICAO and Boeing, narrowing the search to include the fifteen (15) States/Territories of the Middle East Region.

This analysis provides an overview of the accidents between 01 Jan 2008 and 31 Dec 2012.

The analysis covers non-MID and MID Operators.

For the purpose of this analysis, the used definitions are attached to this report as an Appendix.

2.1.1 Analysis of MID Accidents between 2008 and 2012

2.1.1.1 Accidents categories and analysis

Analysis of MID Accidents between 2008 and 2012

ICAO established a reduction in the number of fatal accidents and fatalities worldwide as Safety Targets for 2008-2011 irrespective of the volume of air traffic to achieve a significant decrease in accident rates particularly for regions where those numbers remain high and to reduce regional accident rates so that no region has a rate above twice the worldwide rate by the end of 2011. This section will assist with comprehending behaviour of the Middle East Region in regard to accidents on a global, regional and national basis.

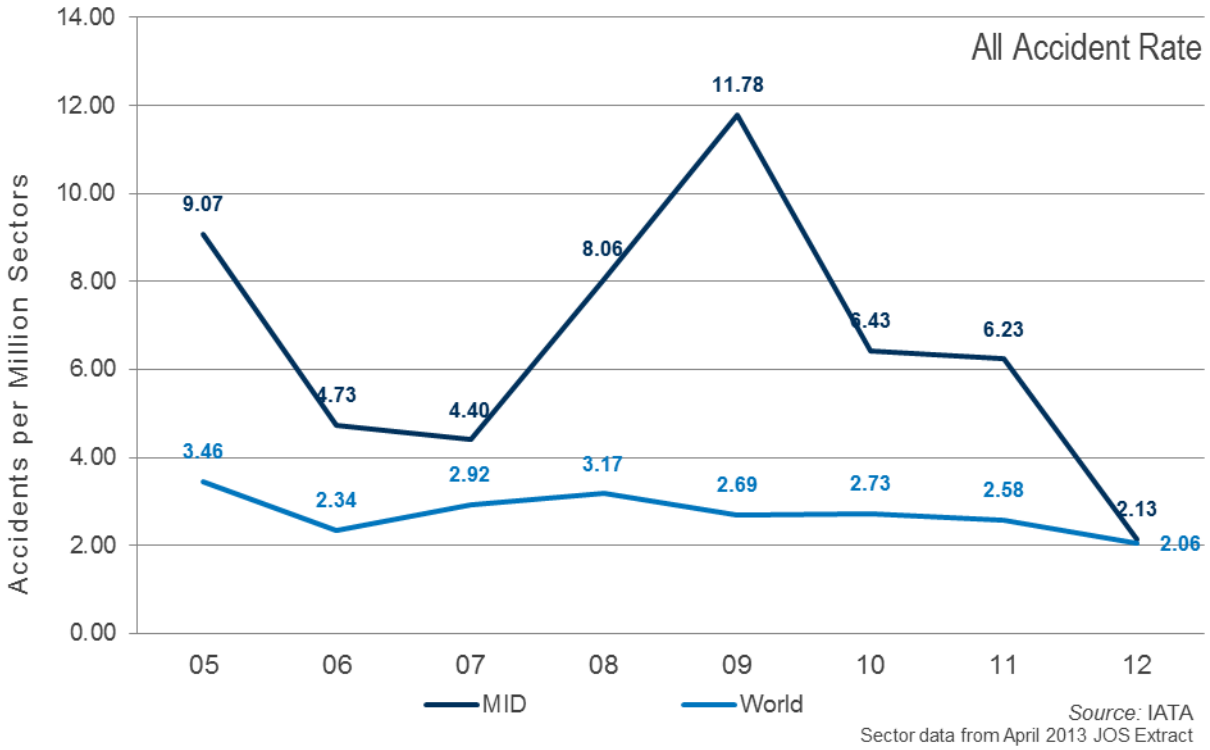
The process followed by the Annual Safety Report Team (ASRT) to analyse reactive information consisted of retrieving safety data from IATA, narrowing the search to include the fifteen (15) States/Territories of the Middle East Region.

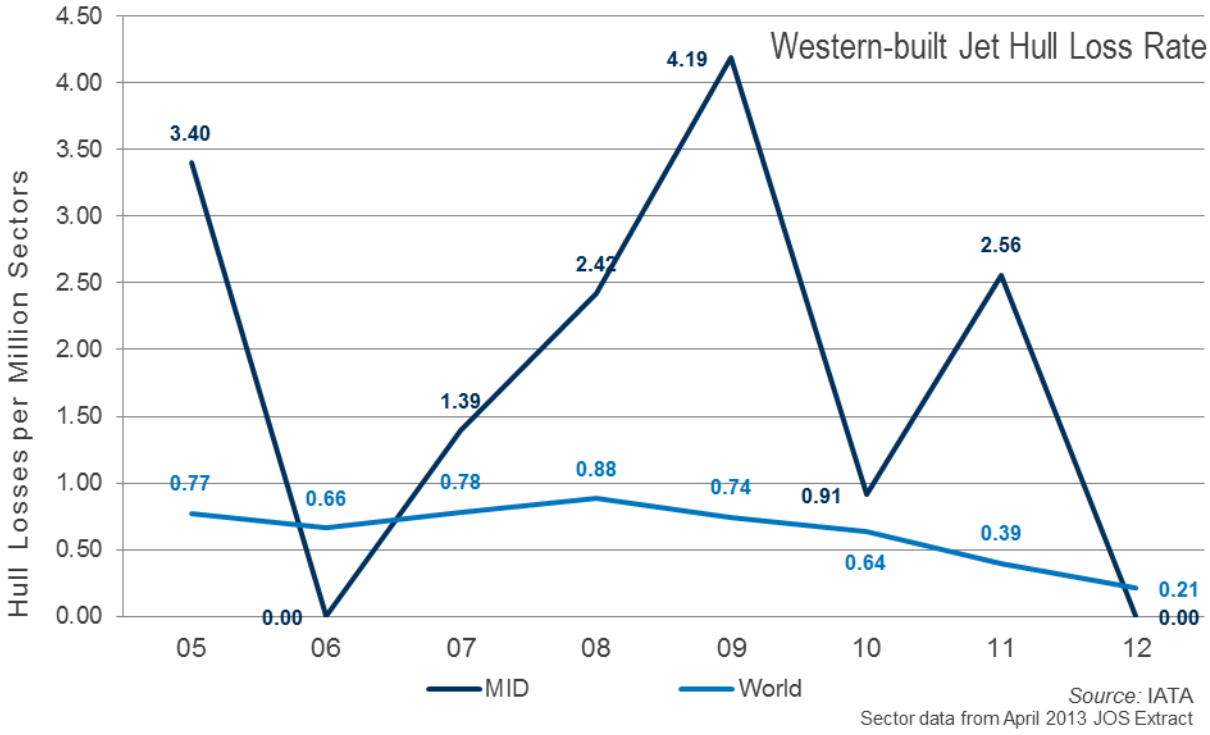
This analysis covers the following MID countries;

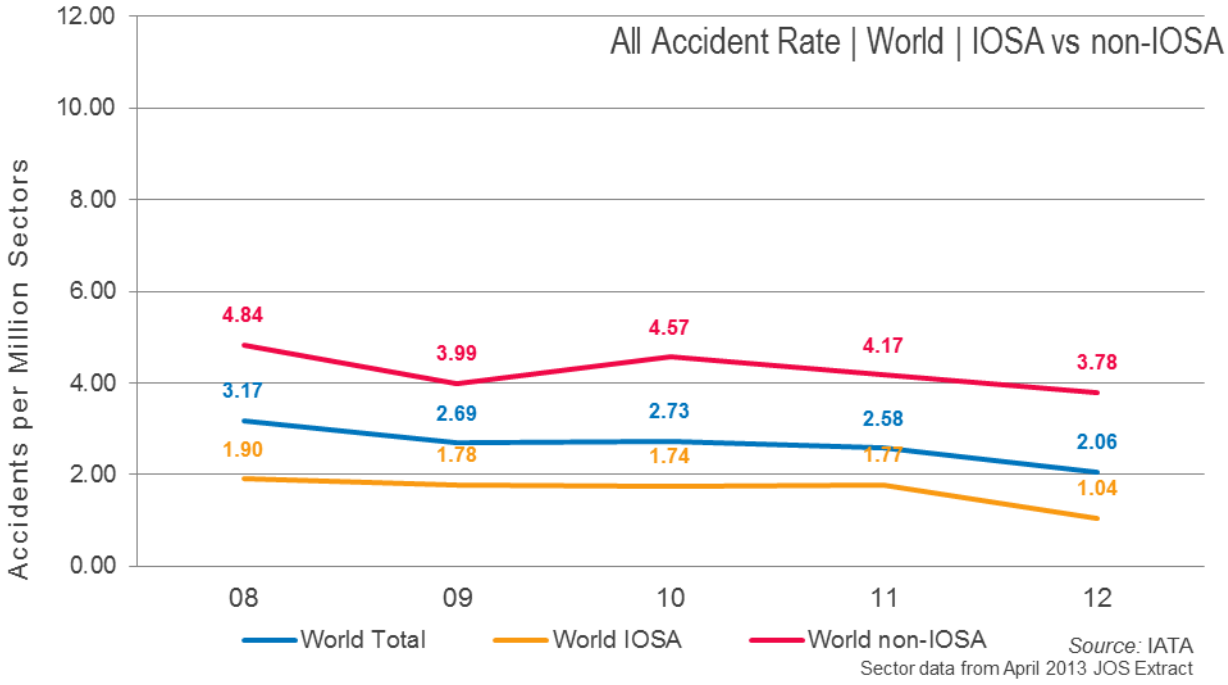
1 Libya
2 Egypt
3 North of Sudan
4 Jordan
5 Lebanon
6 Syria
7 Saudi Arabia
8 Yemen
9 Kuwait
10 Oman
11 United Arab Emirates
12 Bahrain
13 Qatar
14 Iraq
15 Iran

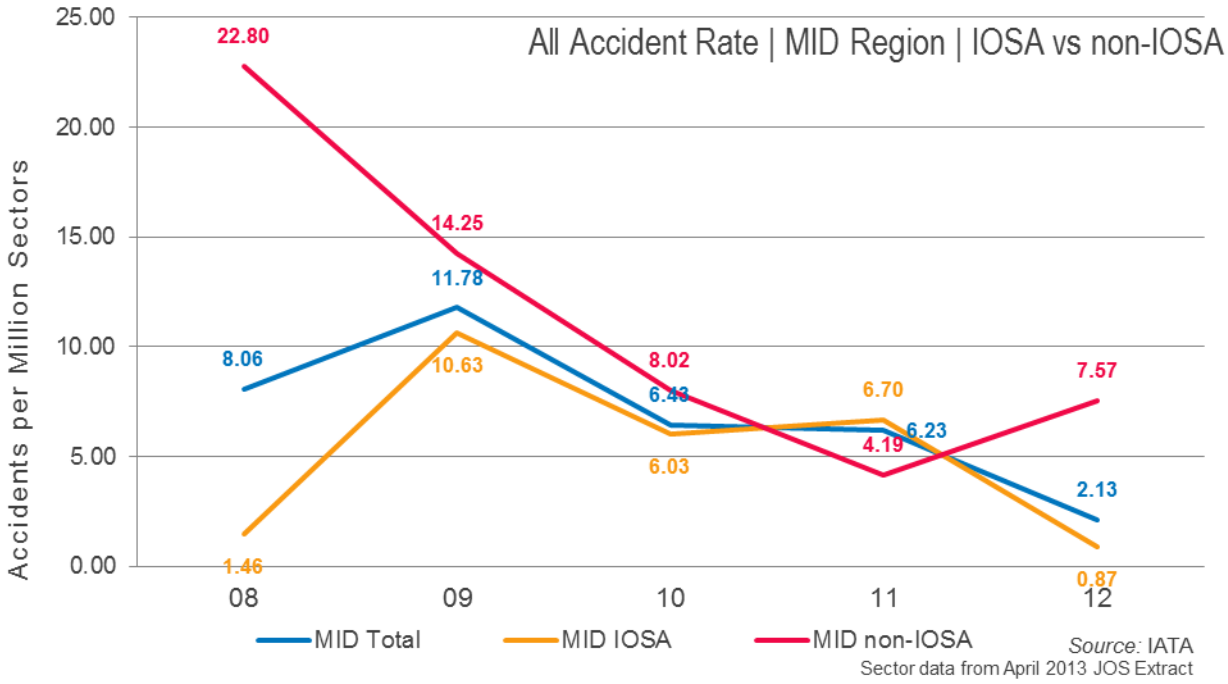
The analysis covers the period 2008-2012.

1. Yearly Trends



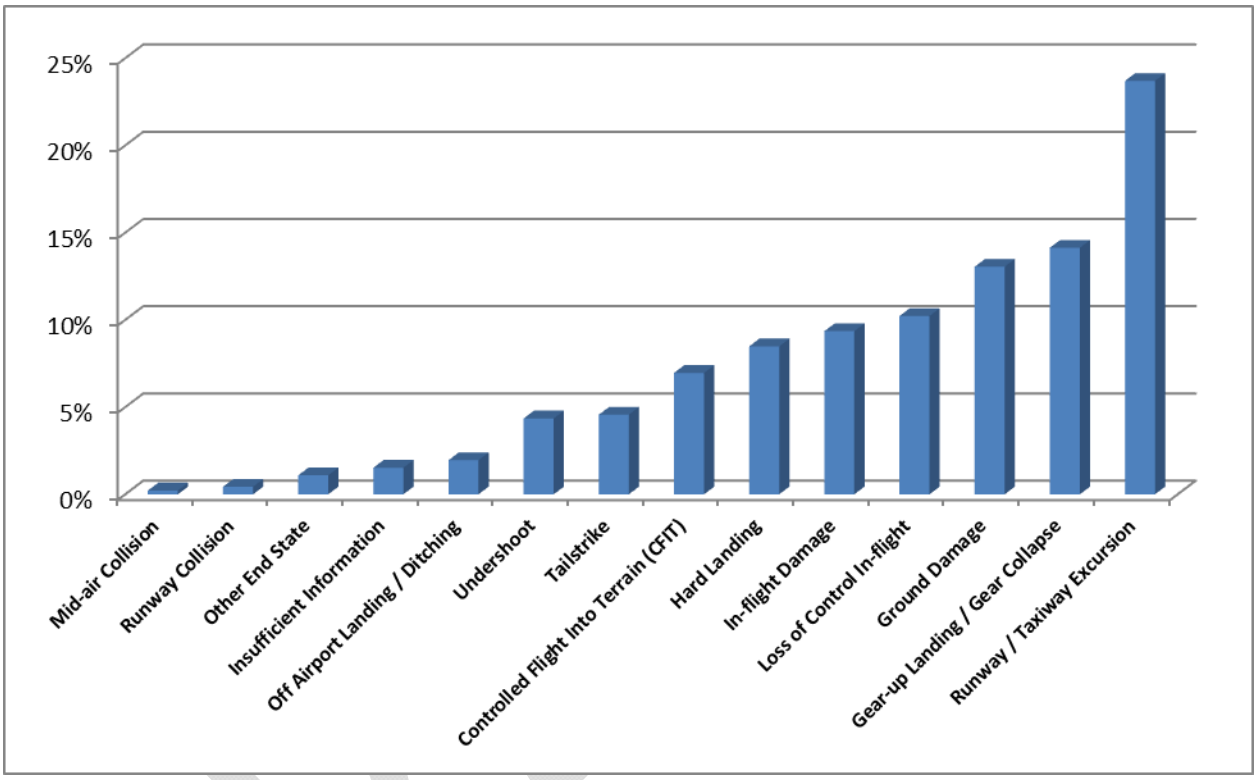



All Accident Rate | World | IOSA vs non-IOSA
Accidents per Million Sectors
12.00
10.00
8.00
6.00
4.00
2.00
0.00
4.84
3.99
4.57
4.17
3.78
3.17
2.69
2.73
2.58
2.06
1.90
1.78
1.74
1.77
1.04
08
09
10
11
12
World Total
World IOSA
World non-IOSA
Source: IATA
Sector data from April 2013 JOS Extract

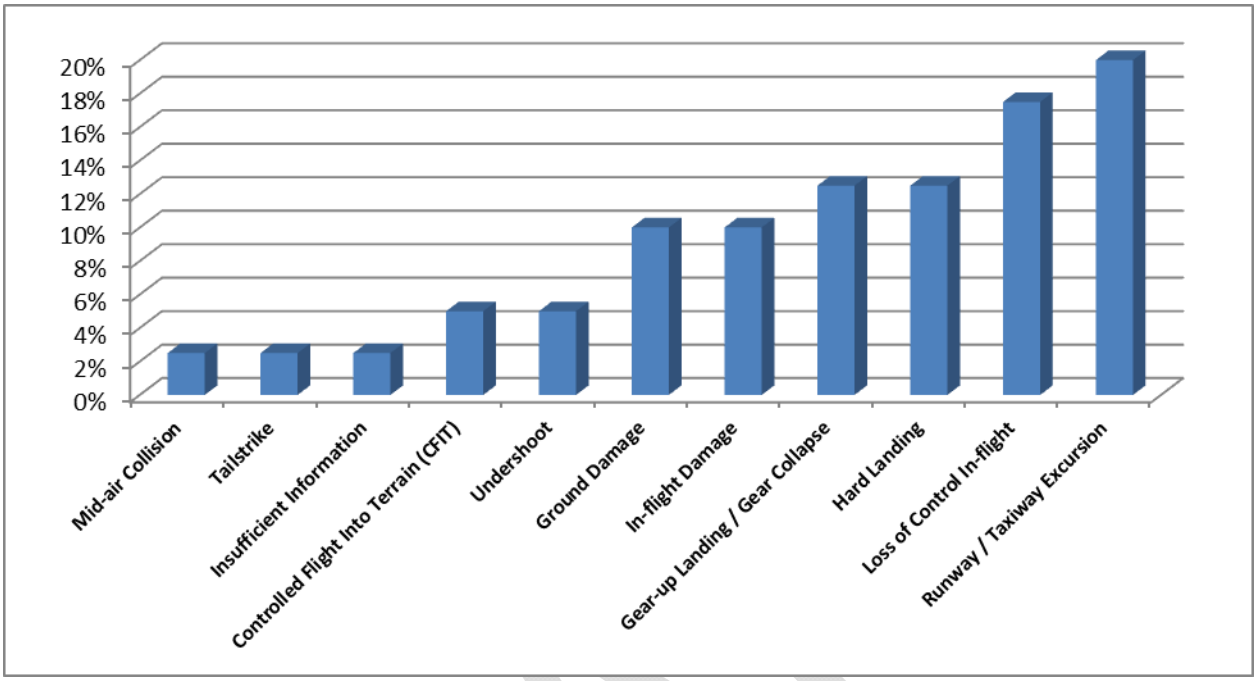

All Accident Rate | MID Region | IOSA vs non-IOSA
Accidents per Million Sectors
25.00
20.00
15.00
10.00
5.00
0.00
22.80
14.25
8.02
4.19
7.57
11.78
8.06
6.43
6.23
2.13
10.63
6.03
6.70
1.46
0.87
08
09
10
11
12
MID Total
MID IOSA
MID non-IOSA
Source: IATA
Sector data from April 2013 JOS Extract

2. Accidents Categories

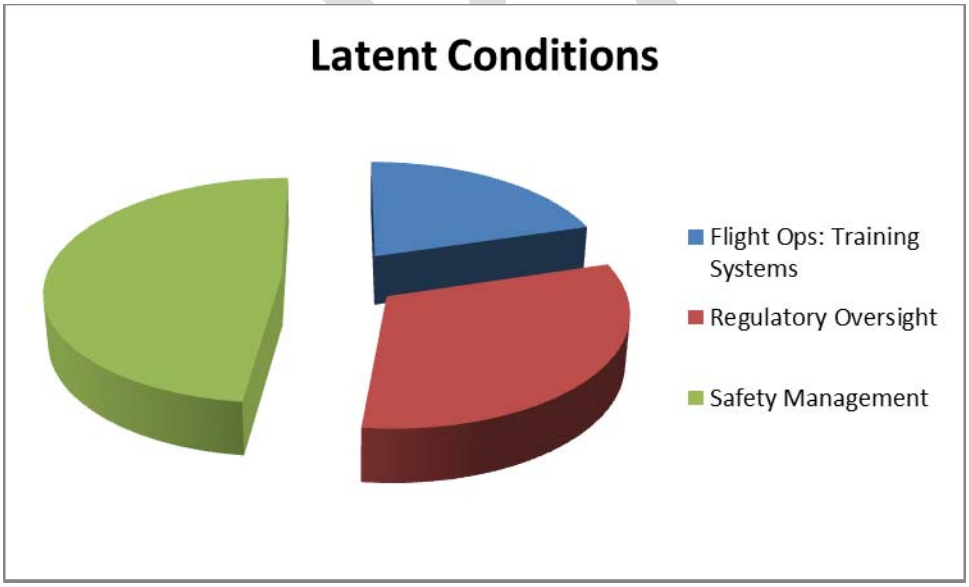
a) World Accident Categories: 2008-2012

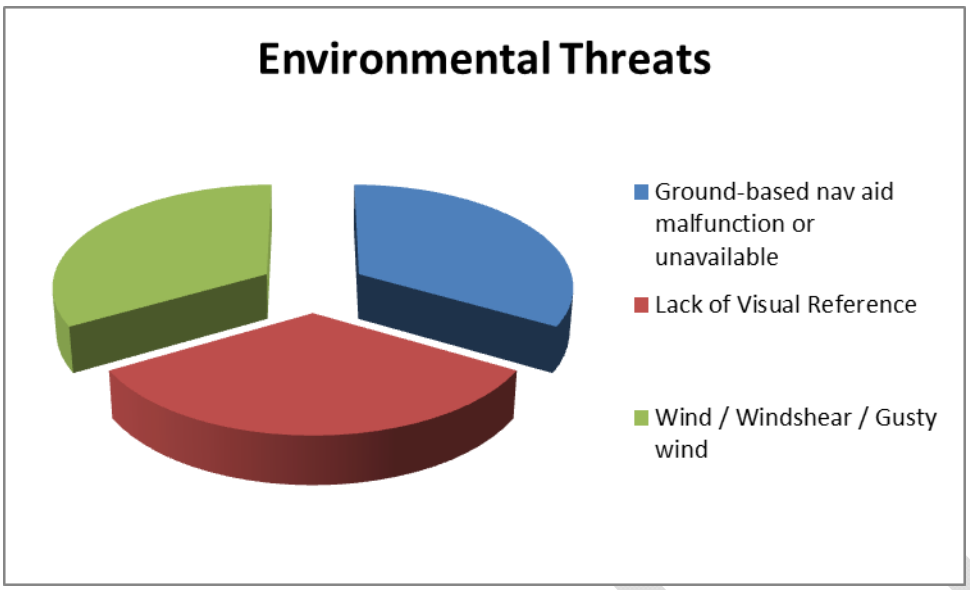


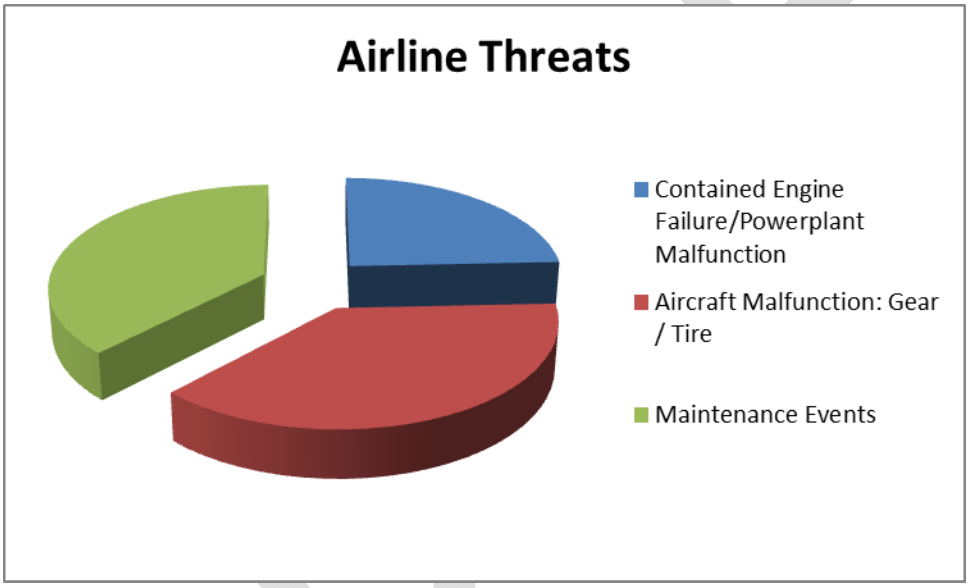
b) MID Accident Categories: 2008-2012

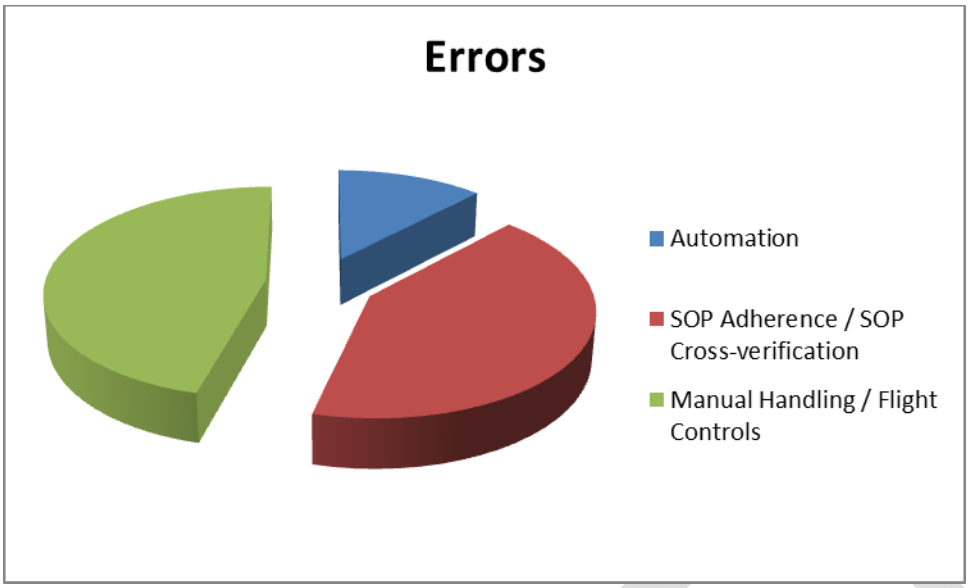


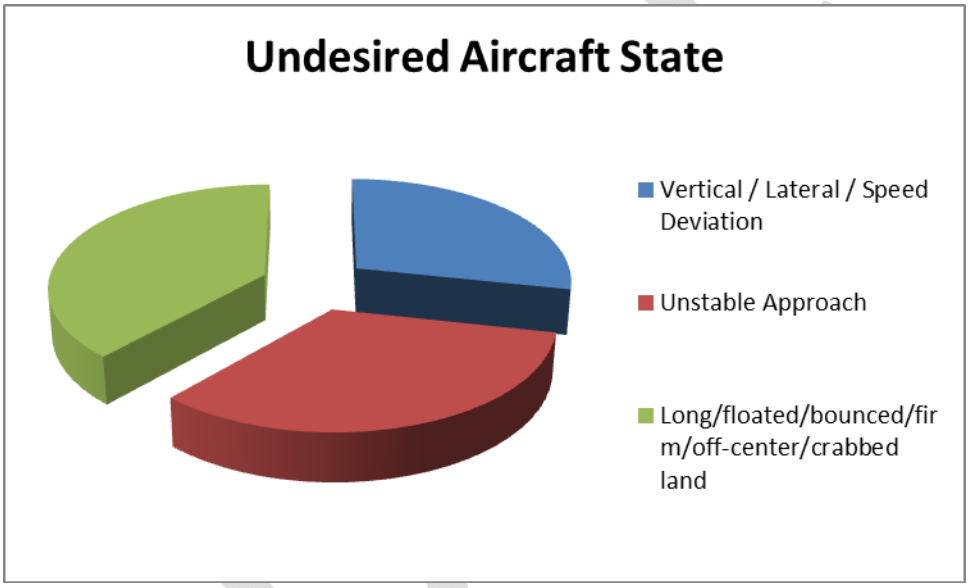
Top Contributing Factors for MID Accidents

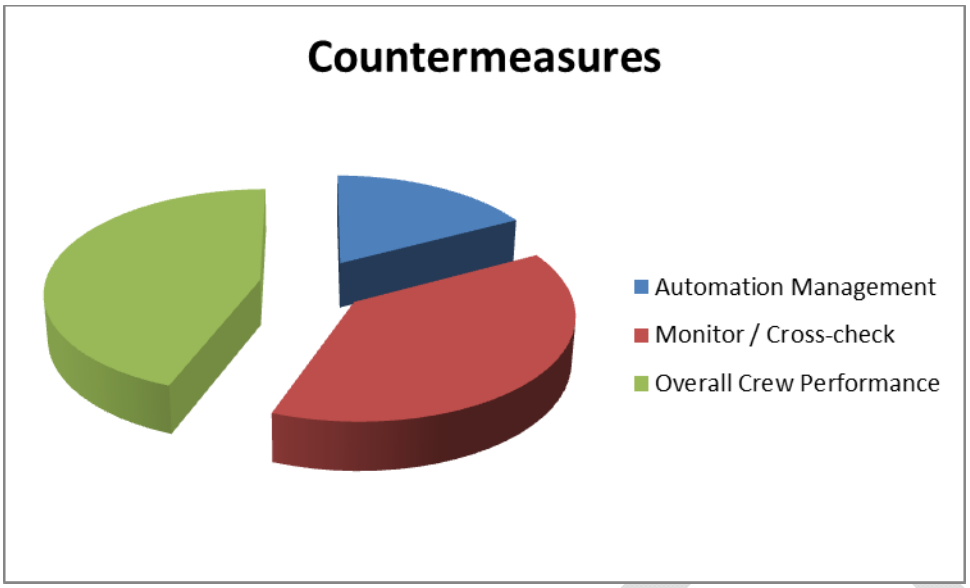



Environmental Threats
Ground-based nav aid malfunction or unavailable
Lack of Visual Reference
Wind / Windshear / Gusty wind


Airline Threats
Contained Engine Failure/Powerplant Malfunction
Aircraft Malfunction: Gear / Tire
Maintenance Events

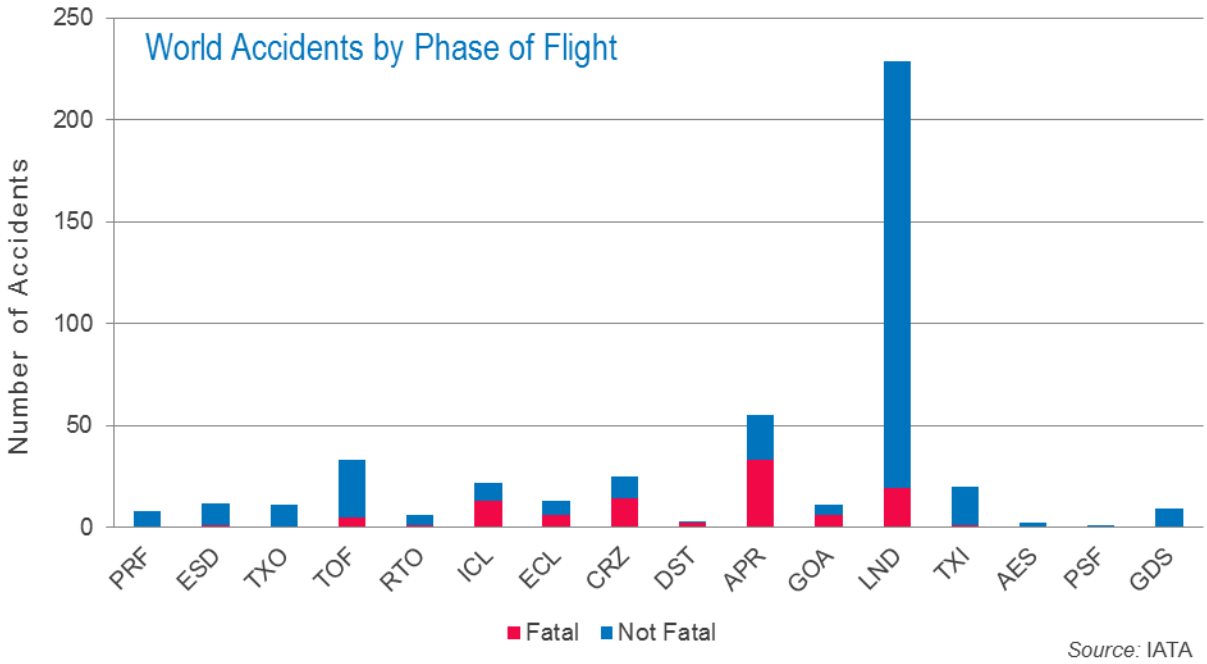

Errors
Automation
SOP Adherence / SOP Cross-verification
Manual Handling / Flight Controls


Undesired Aircraft State
Vertical / Lateral / Speed Deviation
Unstable Approach
Long/floated/bounced/firm/off-center/crabbed land



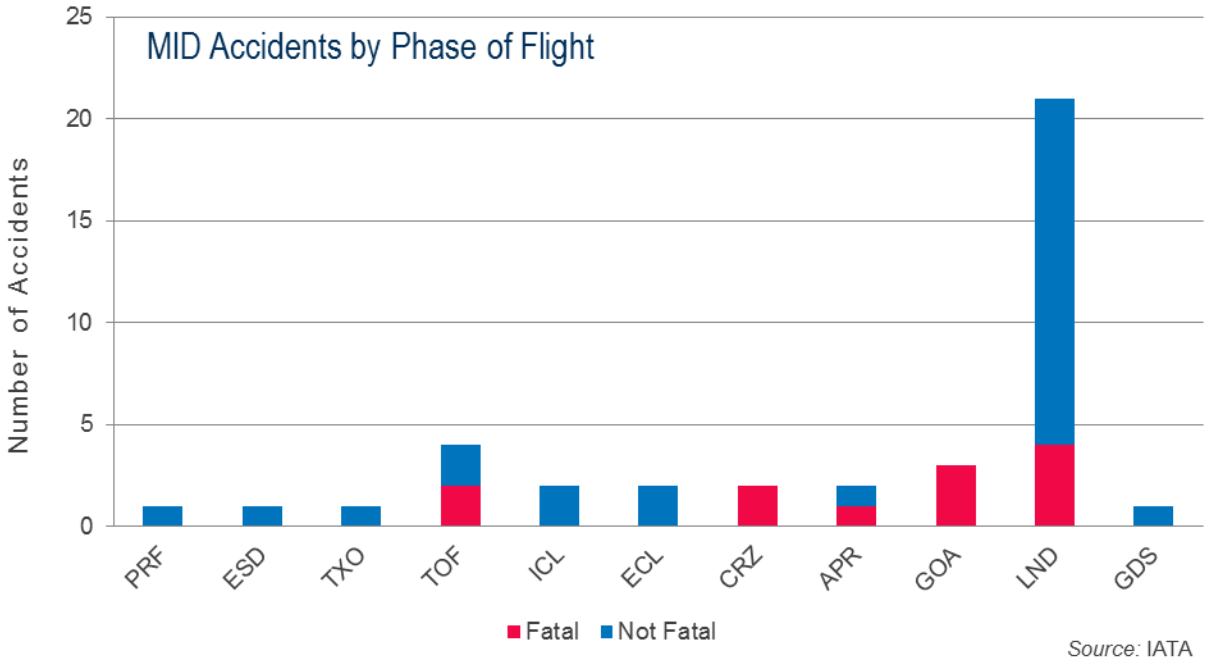
3. Flight Phases

a) World Accident Flight Phases: 2008-2012



Source: IATA

b) MID Accident Flight Phases: 2008-2012

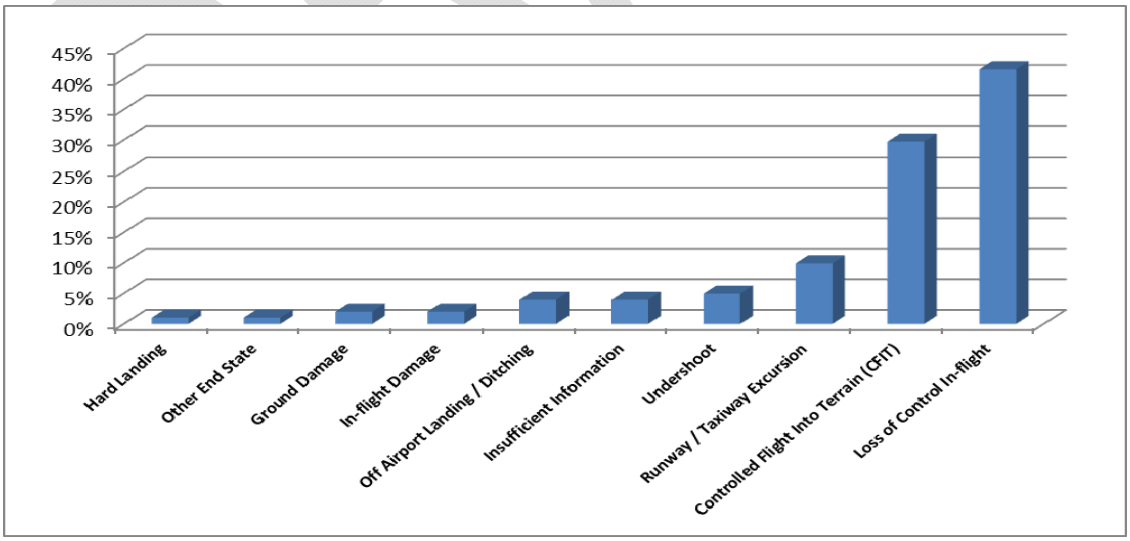


Source: IATA

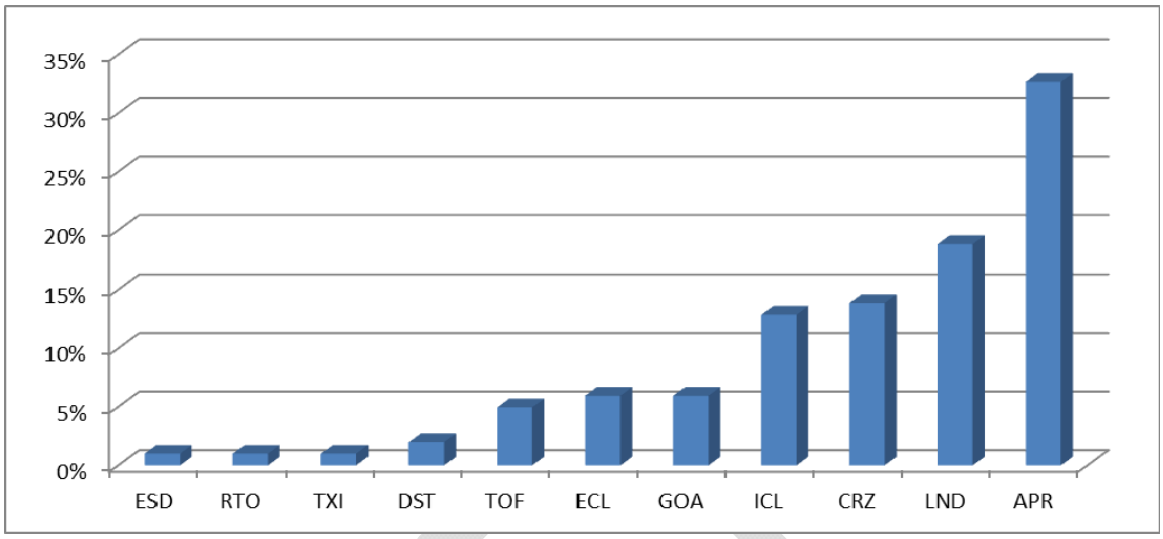
4. Fatal Accidents

a) World Fatal Accident Categories and Phases

i. Categories

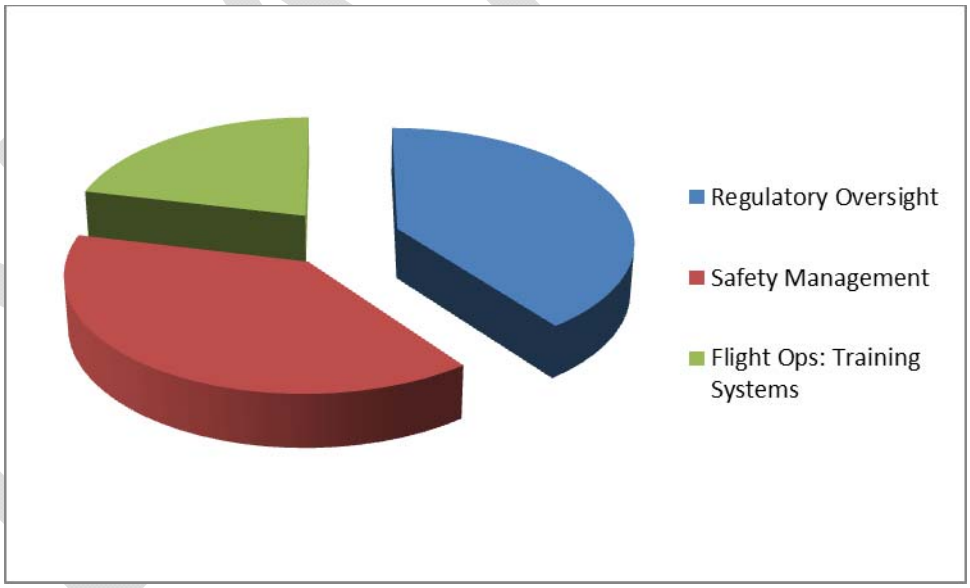


ii. Phases

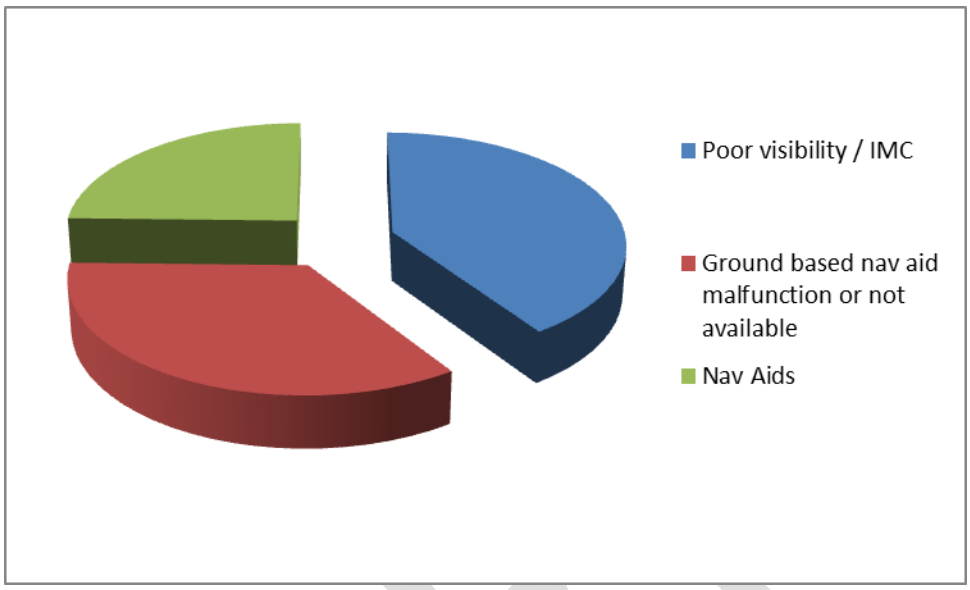


iii. Top Contributing Factors

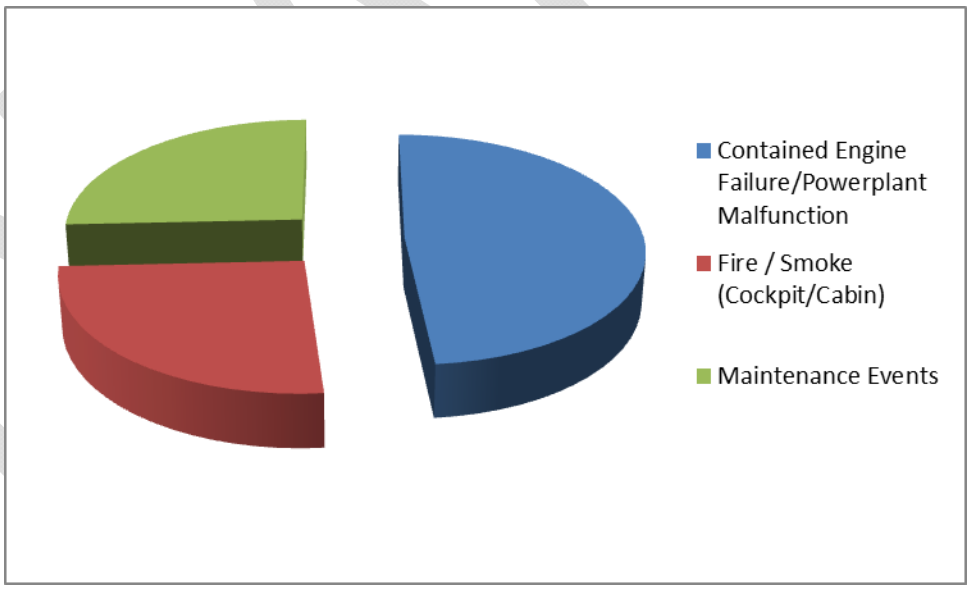
- **Latent Conditions (deficiencies in…)**



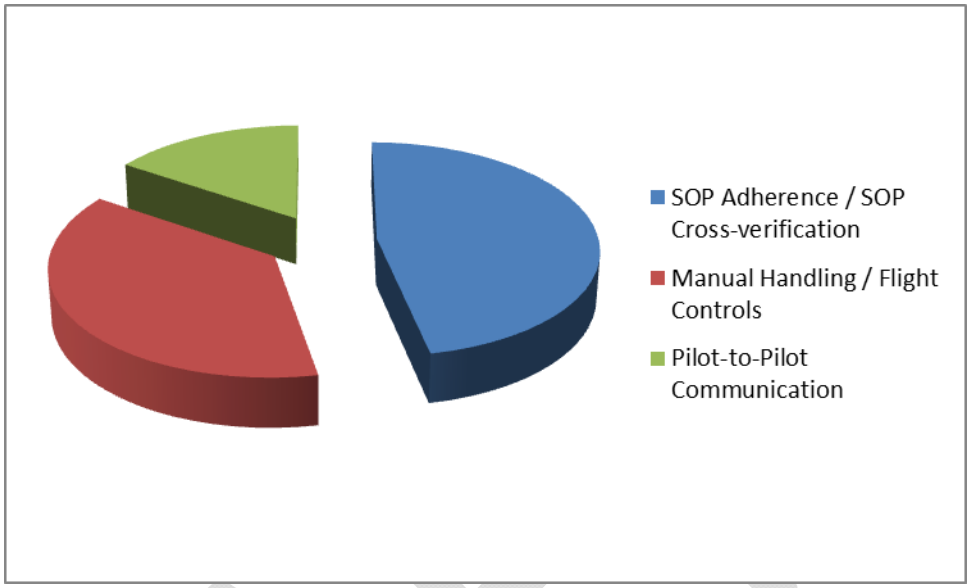
- **Environmental Threats**



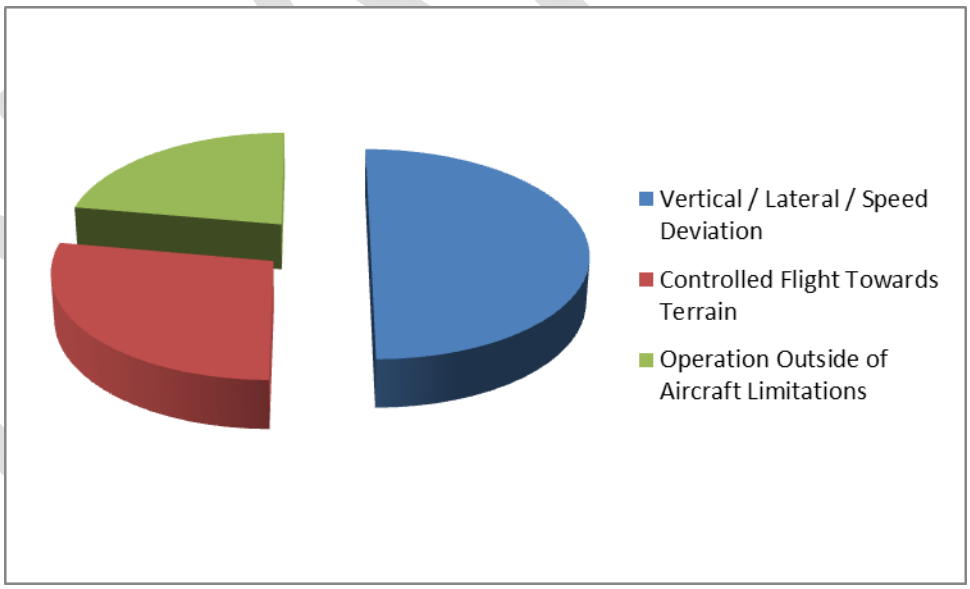
- **Airline Threats**



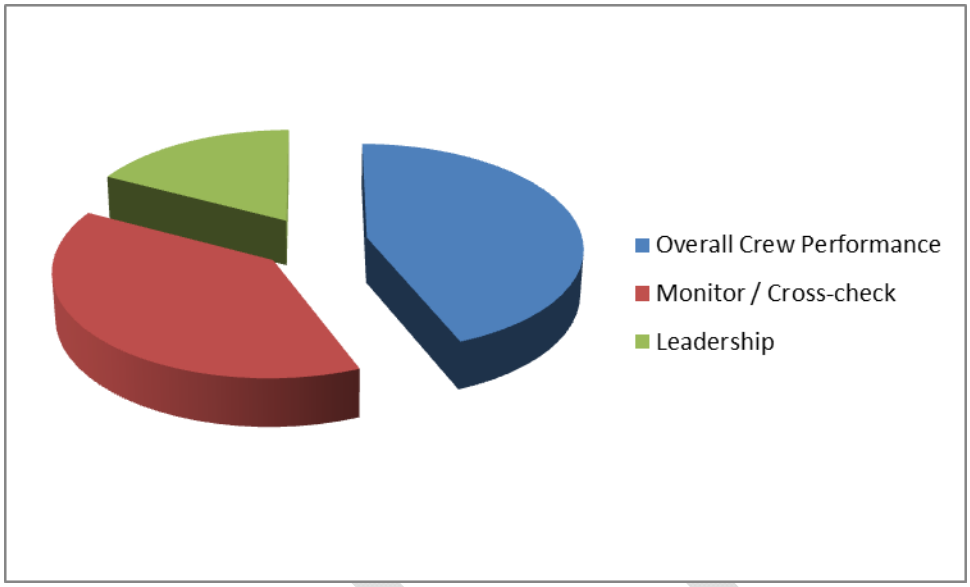
- **Errors (related to…)**



- **Undesired Aircraft States**

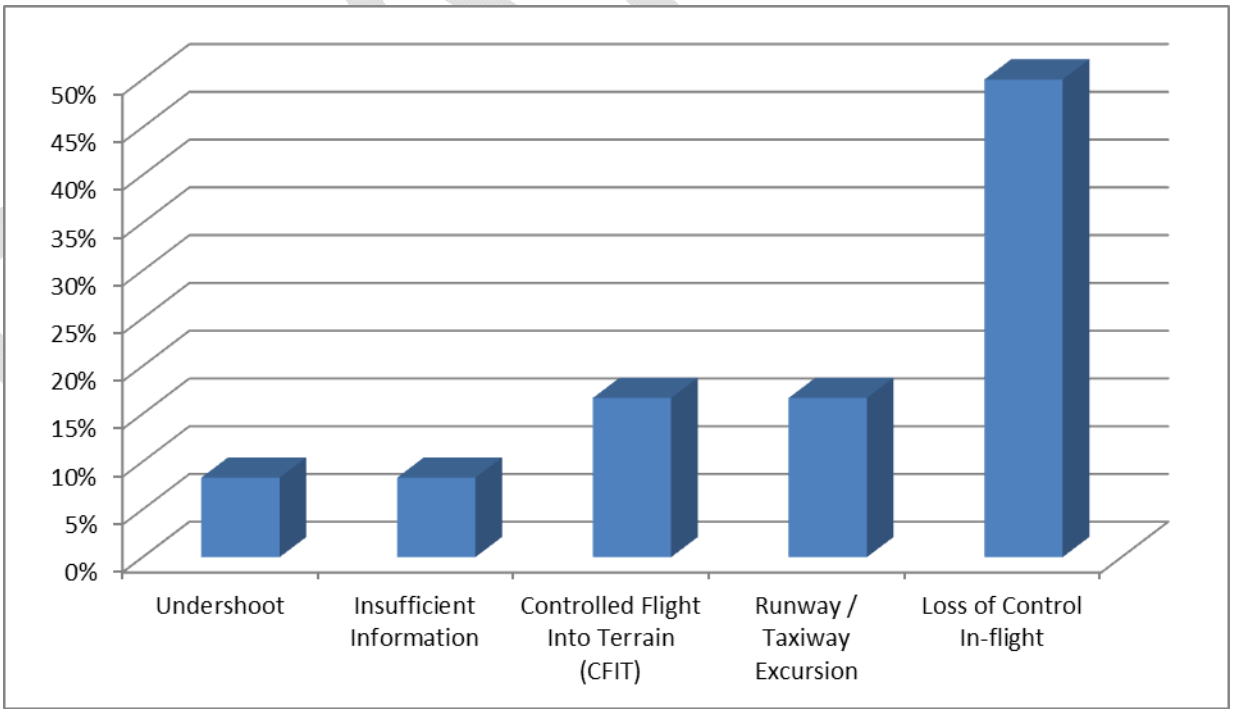


➢ **Countermeasures**

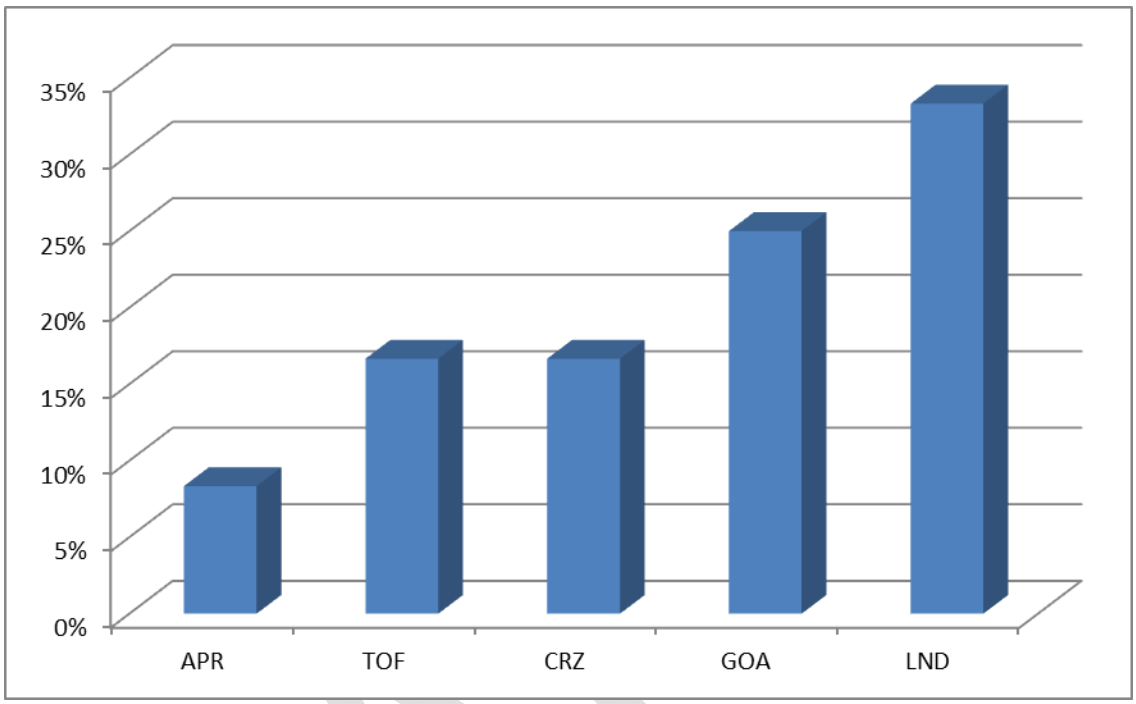


b) MID Fatal Accident Categories and Phases

i. Categories

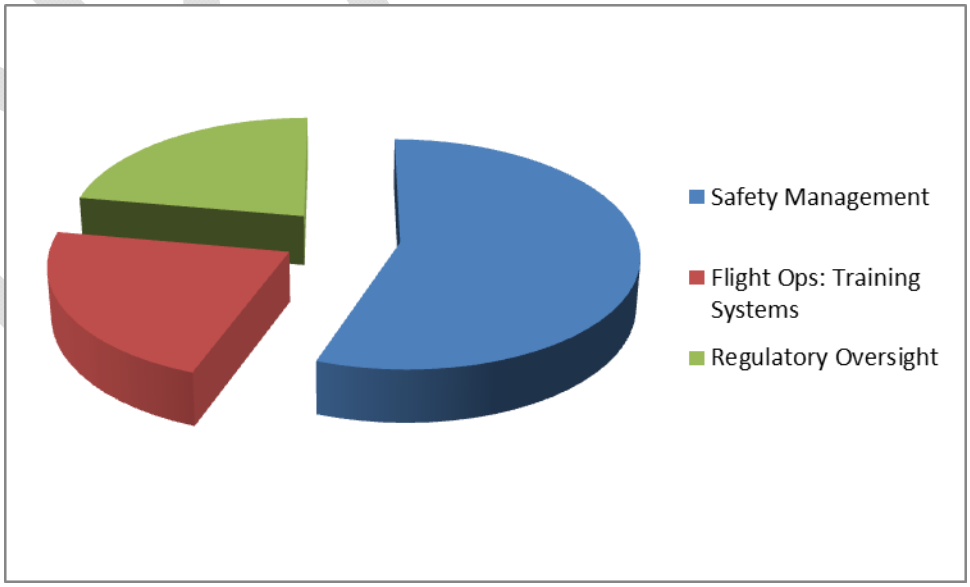


ii. Flight Phases

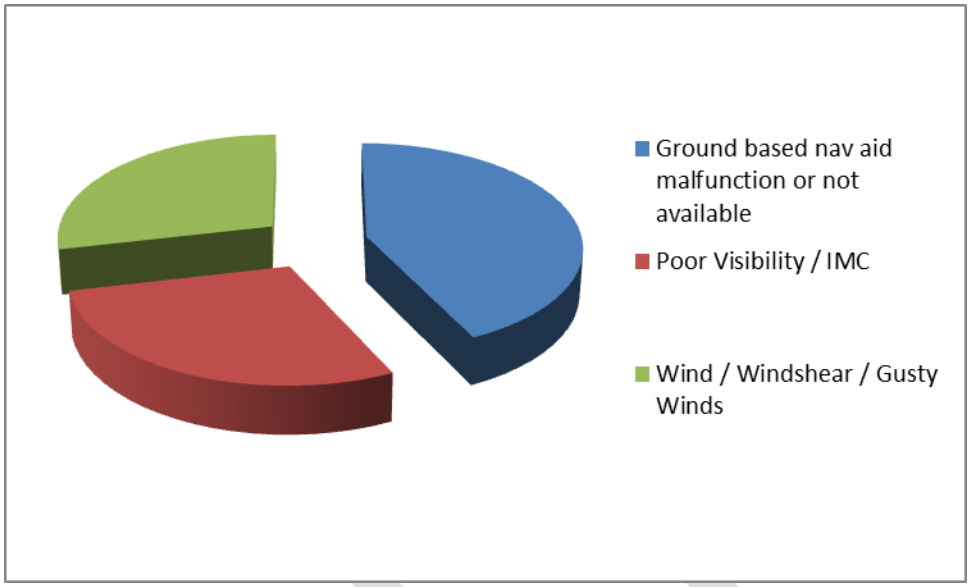


iii. Top contributing Factors

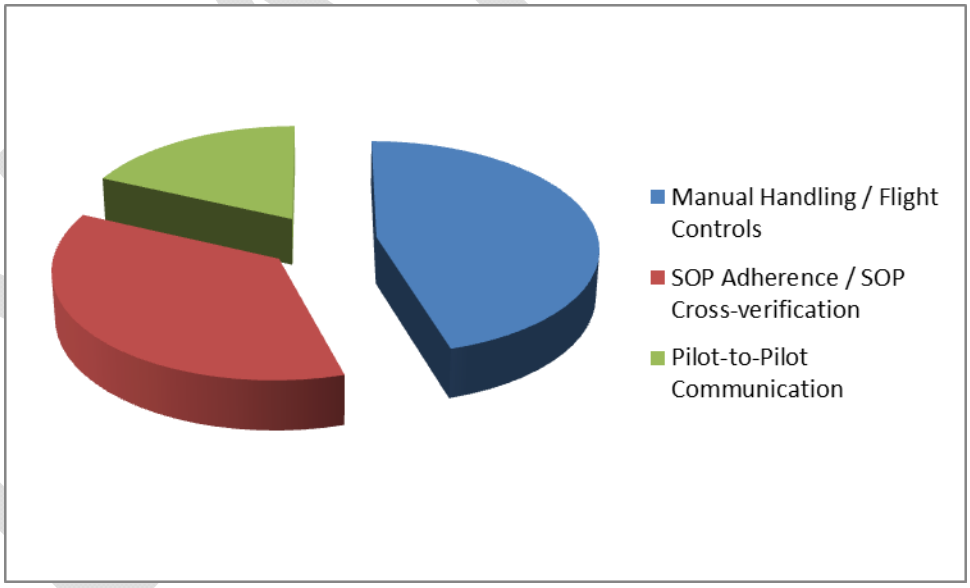
- **Latent Conditions (deficiencies in…)**



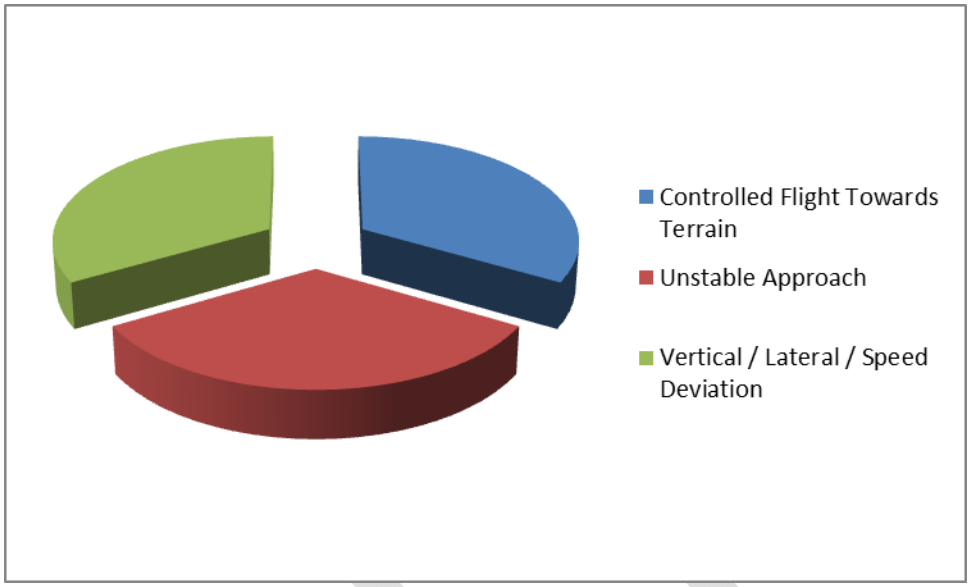
- **Environmental Threats**



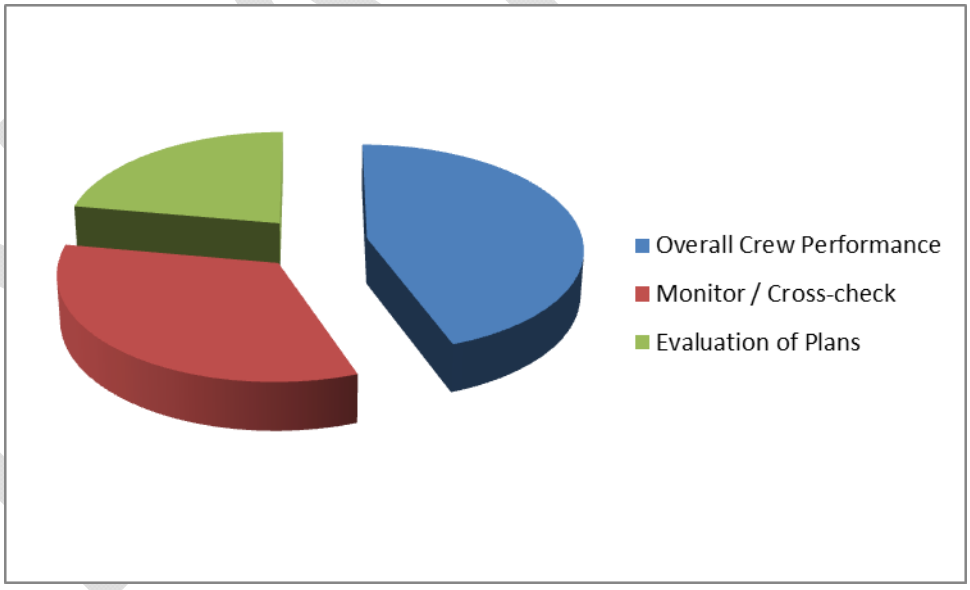
- **Errors (related to…)**



- **Undesired Aircraft State**



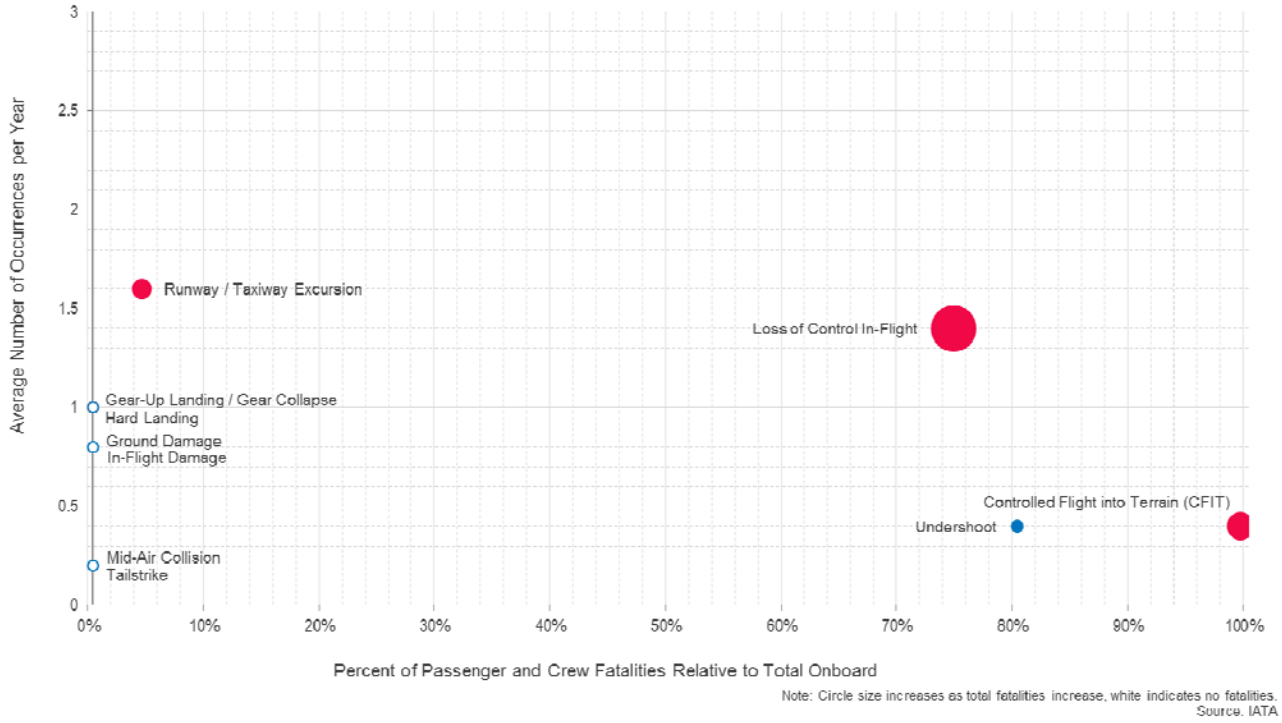
- **Countermeasures**



5. MID Accidents Frequency and Severity

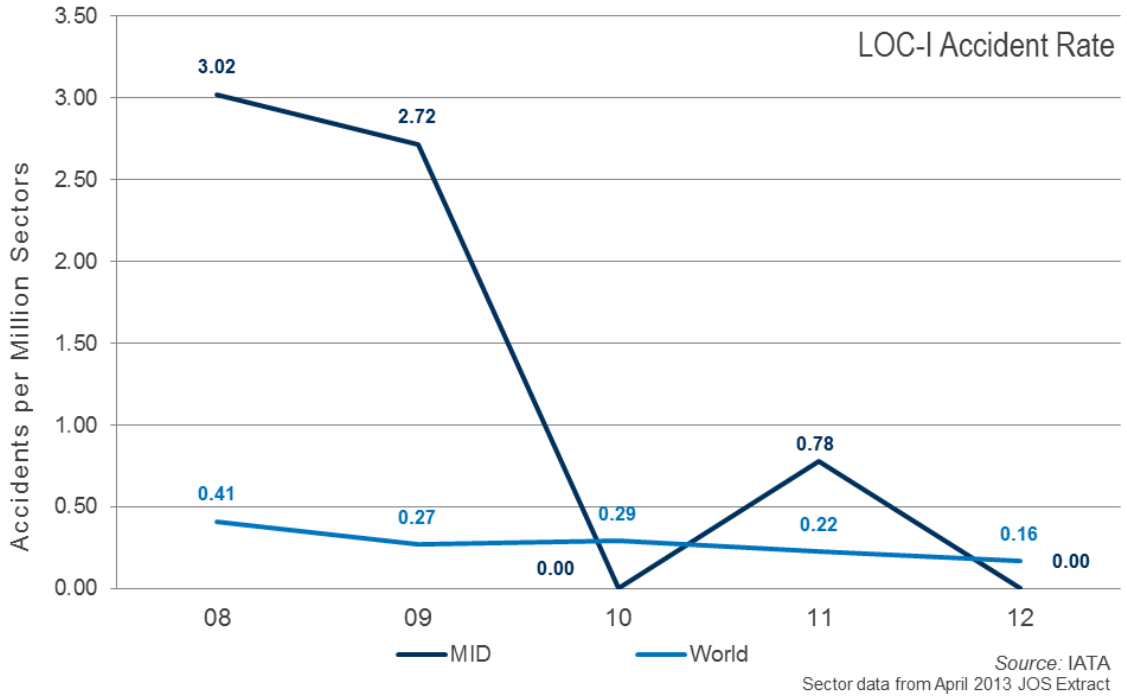
To help understand the relative risks of the different types of accidents, IATA has developed a chart of the frequency and severity of the accident categories for accidents from 2008 to 2012, shown in the figure below. Each accident category is plotted by the average number of occurrences per year for that category and the percentage fatalities relative to the total number of people on board. The bubble size increases as the absolute number of fatalities for the category increases, white bubbles indicate no fatalities for that accident category.

Based on this analysis, the Loss of Control In-flight, Controlled Flight Into Terrain, Runway / Taxiway Excursions and Gear-up Landing / Gear Collapse are the top risk categories of accidents. Together, these categories represent over half of the accidents from 2008 to 2012 and 93 percent of all fatalities. The contributing factors for these categories are further analyzed in this report.

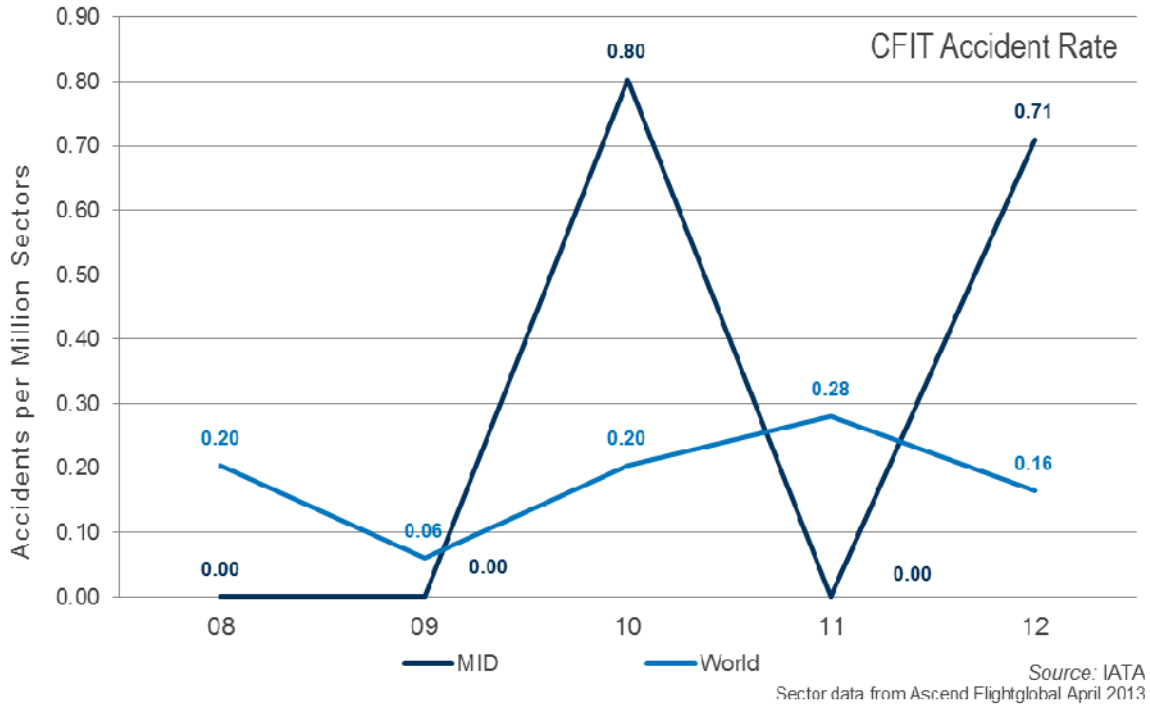


6. MID Accidents High Risk Categories

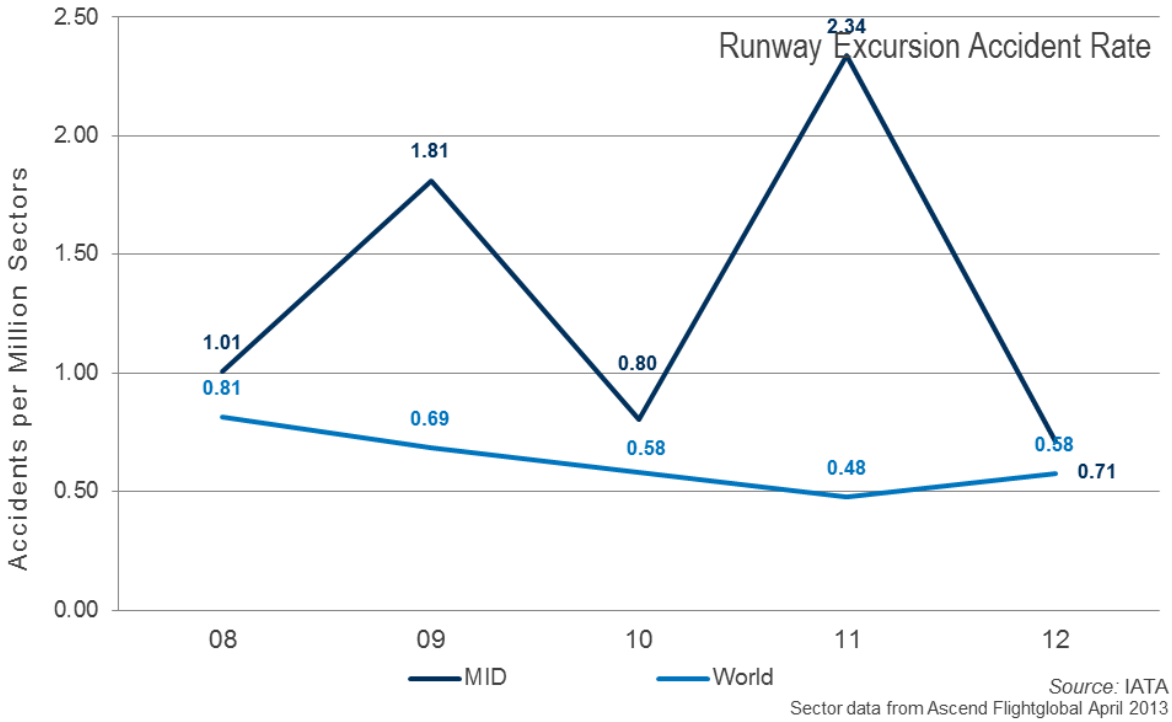
i. Loss of Control In-flight (LOC-I)



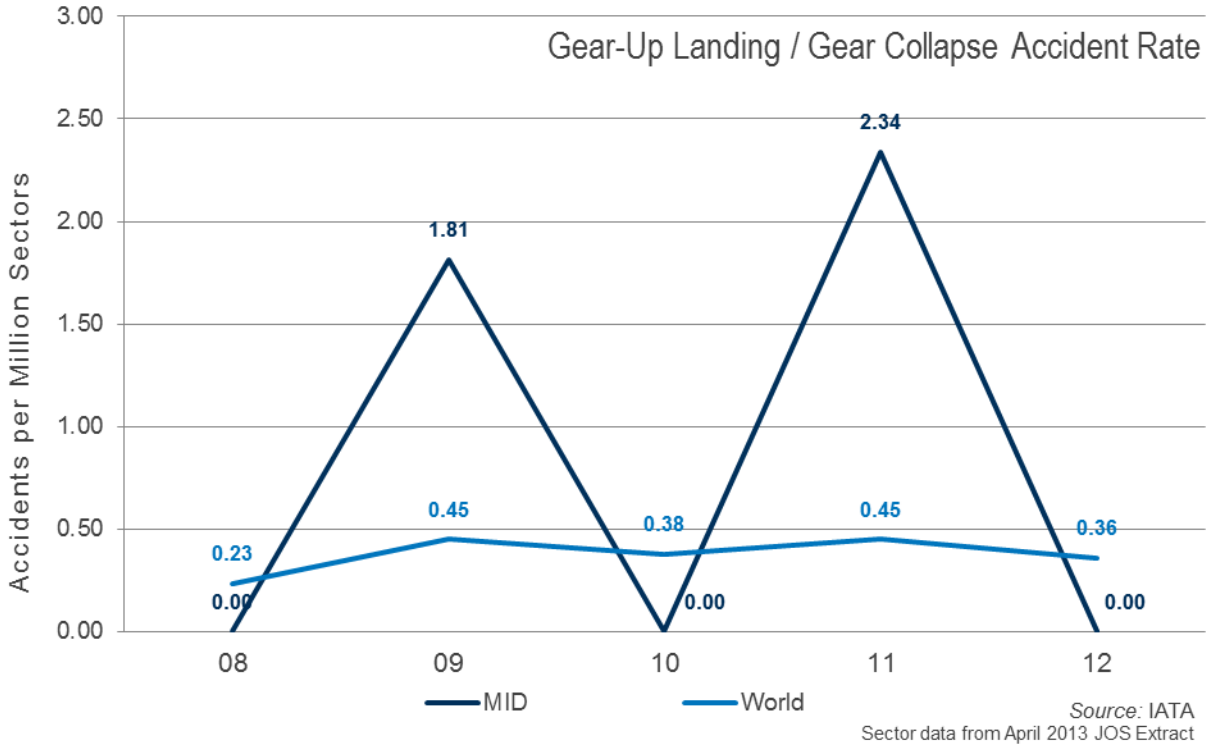
ii. Controlled Flight into Terrain (CFIT)



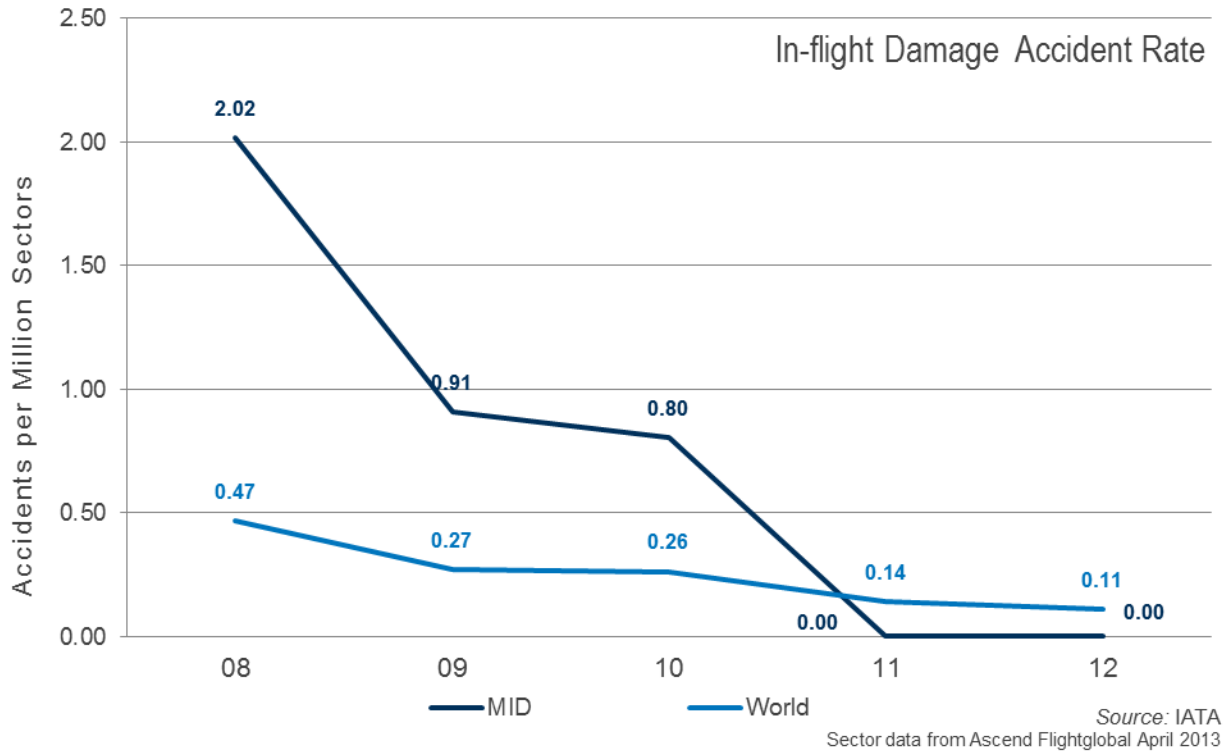
iii. Runway Excursion



iv. Gear-Up Landing / Gear Collapse

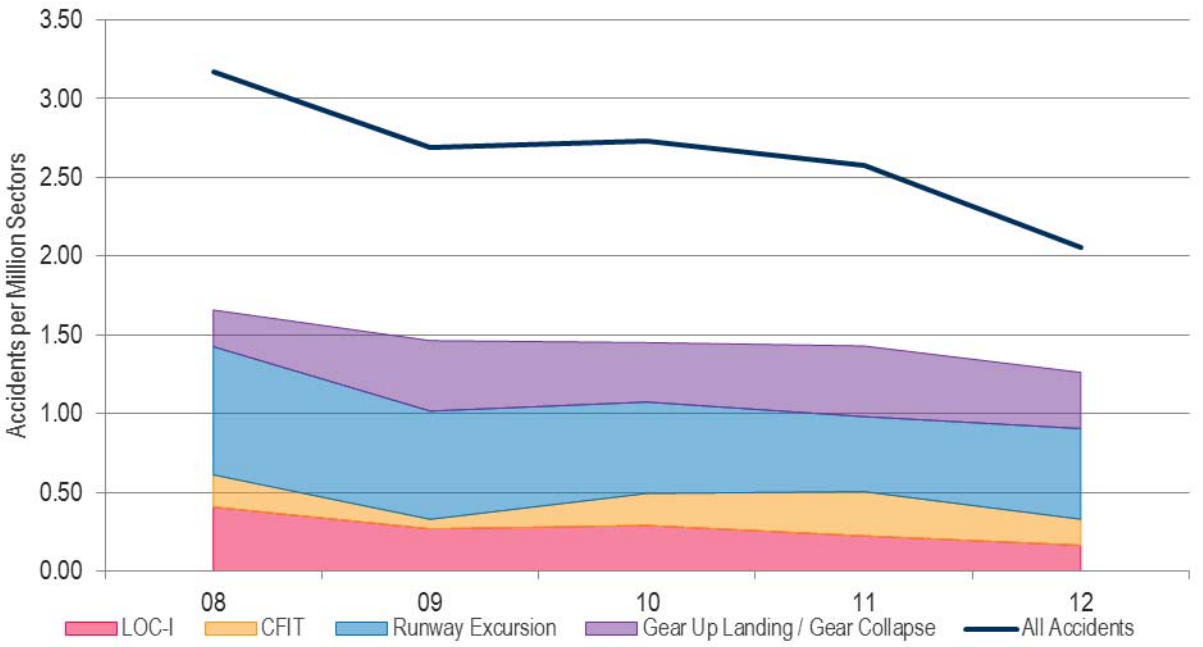


v. In-flight Damage



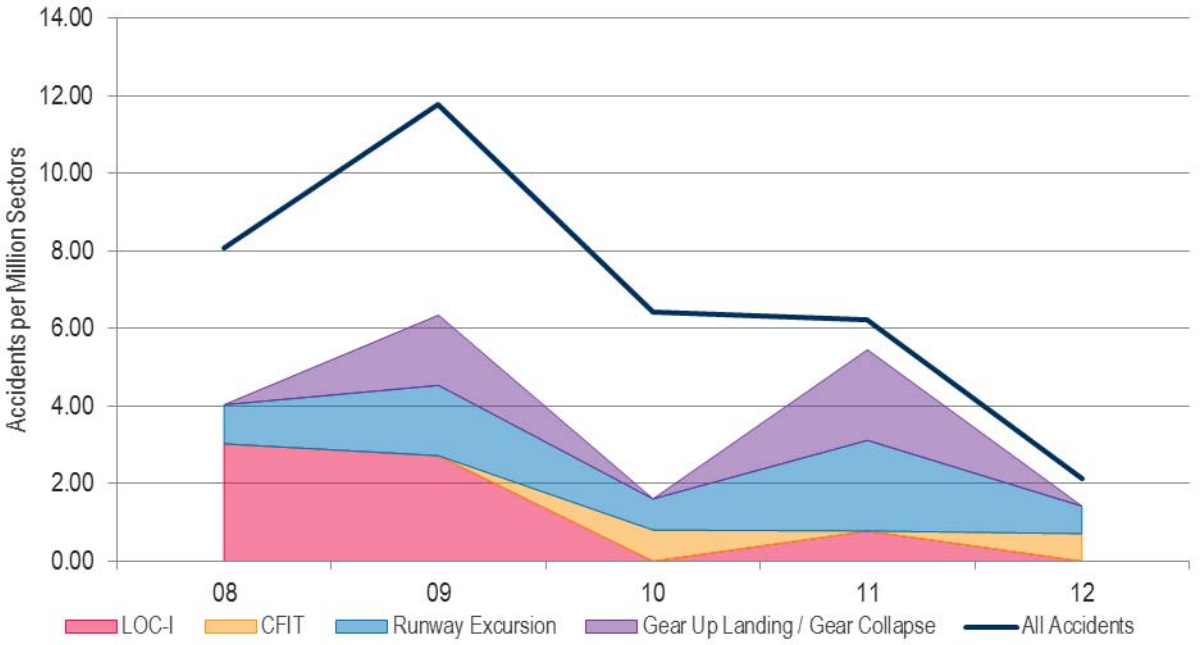
Source: IATA
Sector data from Ascend Flightglobal April 2013

7. High Risk Categories – Global



Source: IATA
Sector data from Ascend Flightglobal April 2013

8. High Risk Categories – MID Region



Source: IATA
Sector data from Ascend Flightglobal April 2013

2.1.1.2 In-depth Analysis of Key Safety Focus Areas for MID Region (2008 to 2012)

Taking a more in-depth look at the accidents statistics for MID Region, the following observations are made;

1. All accidents rate in the MID region was above the World average by an average of 3.86.
2. All MID accidents among non-IOSA registered operators was above the World average by an average of 6.23.
3. The most frequent Accidents Categories for the period 2008 – 2012 for the MID Region are;

    i. Runway / Taxiway Excursions
    ii. Loss of Control In-flight
    iii. Hard Landing
    iv. Gear-up Landing / Gear Collapse
    v. In-flight Damage

4. Top Contributing Factors are;

    i. Safety Management
    ii. Aircraft Malfunction
    iii. Maintenance Events
    iv. SOP Adherence / SOP Cross-verification
    v. Unstable Approaches
    vi. Log/floated/bounced/firm/off-centre/crabbed land
    vii. Monitor/cross check
    viii. Overall crew performance

5. Top Two flight phases when accidents occur in the MID region are LND and TOF
6. Top three fatal accidents categories for the MID region are;

    i. LOC-I
    ii. Runway/Taxiway Excursions
    iii. CFIT

In the following is an in-depth analysis of the high risk accidents categories in the MID region for the period 2008 till 2012.

2.1.1.2.1 Loss of Control In-flight (LOC-I)

1. Trend 2008 to 2012

Region	08	09	10	11	12
MID	3.02	2.72	0.00	0.78	0.00
World	0.41	0.27	0.29	0.22	0.16

2. Top Contributing Factors

Latent Conditions (deficiencies in…)	%
Safety Management	29%

Environmental Threats	%
Icing Conditions	29%

Airline Threats	%
Contained Engine Failure/Powerplant M	29%

Errors (related to…)	%
SOP Adherence / SOP Cross-verificatior	43%

Undesired Aircraft States	%
Operation Outside of Aircraft Limitations	29%
Unnecessary Weather Penetration	29%

Countermeasures	%
Overall Crew Performance	43%

3. Severity of Outcomes

Accident Fatal	
Fatal	6
Non Fatal	1

Total Fatalities	415

Level of Damage	
Hull Loss	7
Substantial Damage	0

2.1.1.2.2 Runway Excursion

1. Trend 2008 to 2012

Region	08	09	10	11	12
MID	1.01	1.81	0.80	2.34	0.71
World	0.81	0.69	0.58	0.48	0.58

2. MID Top Contributing Factors

Latent Conditions (deficiencies in...)	%
Safety Management	25%

Environmental Threats	%
Poor/faint markings/signs or runway/taxiway closure	25%
Wind/Windshear/Gusty wind	25%

Errors (related to...)	%
Manual Handligh / Flight Controls	75%
SOP Adherence / SOP Cross-verification	38%

Undesired Aircraft States	%
Long/floated/bounced/firm/off-center/crabbed land	50%
Unstable Approach	38%
Continued Landing adter Destabilization on Approach	38%

Countermeasures	%
Overall Crew Performance	38%
Monitor / Cross-check	25%

3. Severity of Outcomes

Accident Fatal	
Fatal	2
Non Fatal	6

Total Fatalities	49

Level of Damage	
Hull Loss	5
Substantial Damage	3

2.1.1.2.3 Controlled Flight into Terrain (CFIT)

1. Trend 2008 to 2012

Region	08	09	10	11	12
MID	0.00	0.00	0.80	0.00	0.71
World	0.20	0.06	0.20	0.28	0.16

2. MID Top Contributing Factors

   Reference is made to the global statistics and analysis.

3. Severity of Outcomes

Accident Fatal	
Fatal	2
Non Fatal	0

Total Fatalities	135

Level of Damage	
Hull Loss	2
Substantial Damage	0

2.1.1.2.4 Gear up Landing / Gear Collapse

1. Trend 2008 to 2012

Region	08	09	10	11	12
MID	0.00	1.81	0.00	2.34	0.00
World	0.23	0.45	0.38	0.45	0.36

2. MID Top Contributing Factors

Latent Conditions (deficiencies in...)	#
Maintenance Ops: SOPs & Checking	4
Maintenance Ops: Training	4
Regulatory Oversight	4

Airline Threats	#
Aircraft Malfunction: Gear / Tire	3
Maintenance Events	3

3. Severity of Outcomes

Accident Fatal	
Fatal	0
Non Fatal	5

Level of Damage	
Hull Loss	2
Substantial Damage	3

2.1.1.2.5 In-flight Damage

1. Trend 2008 to 2012

Region	08	09	10	11	12
MID	2.02	0.91	0.80	0.00	0.00
World	0.47	0.27	0.26	0.14	0.11

2. MID Top Contributing Factors
3. Severity of Outcomes

Accident Fatal

Fatal	0
Non Fatal	4

Level of Damage

Hull Loss	0
Substantial Damage	4

2.1.1.3 Safety Performance - Safety Indicators and Objectives

	Metric	Safety Indicator	Safety Target
1	Accidents and serious incidents	Number of accidents per million departures	Progressively reduce the accident rate to be in line with the global average by the end of 2017.
		Number of fatal accidents per million departures	Progressively reduce the rate of fatal accidents to be in line with the global average by the end of 2017.
2	Runway and Ground Safety (RGS)	Number of Runway excursion related accidents as a percentage of all accidents	Reduce Runway Excursions related accidents by 50% by the end of 2017
		Number of Runway incursion related accidents as a percentage of all accidents	Reduce Runway Incursions related accidents by 50% by the end of 2017
3	In-Flight Damage (IFD)	Number of In-flight Damage related accidents as a percentage of all accidents	Reduce In-flight Damage related accidents by 50% by the end of 2017
4	Loss of Control In-Flight (LOC-I)	Number of LOC-I related accidents as a percentage of all accidents	Reduce LOC-I related accidents by 50% by the end of 2017
5	Controlled Flight Into Terrain (CFIT)	Number of CFIT related accidents as a percentage of all accidents	Maintain CFIT related accidents below the global rate
6	Safety oversight capabilities (USOAP-CMA, IOSA and ISAGO)	USOAP-CMA Effective Implementation (EI) results: a. Number of States with an EI score less than 60% for more than 2 areas (LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA) b. Number of States with an overall EI over 60%	Progressively increase the USOAP-CMA EI scores/results: a. Max 3 States with an EI score less than 60% for more than 2 areas (i.e. Min 12 States having at least 60% EI for 6 out of the 8 areas) and an overall EI over 60%, by the end of 2015; and b. all the 15 MID States to have at least 60% EI by the end of 2016 .
		Number of Significant Safety Concerns	a. States resolve identified Significant Safety Concerns as a matter of urgency and in any case within 12 months from their identification b. No significant Safety Concern by end of 2016

		Use of the IATA Operational Safety Audit (IOSA), to complement safety oversight activities	a. Maintain at least 60% of the MID airlines to be certified IATA-IOSA by the end of 2015 at all times b. All MID States to accept the IATA Operational Safety Audit (IOSA) as an acceptable Means of Compliance (AMC) by 2015 to complement their safety oversight activities.
		Number of Ground Handling service providers in the MID Region having the IATA Safety Audit for Ground Operations (ISAGO) certification, as a percentage of all Ground Handling service providers	a. 50% of the Ground Handling service providers to be certified IATA-ISAGO by the end of 2015 b. all Ground Handling service providers to be certified IATA-ISAGO by the end of 2017 c. The IATA Ground Handling Manual (IGOM) endorsed as a reference for ground handling safety standards by all MID States by end of 2015.
7	Aerodrome Certification	Number of certified international aerodrome as a percentage of all international aerodromes in the MID Region	a. 50% of the international aerodromes certified by the end of 2015 b. 80% of the international aerodromes certified by the end of 2016
8	SSP/SMS Implementation	Number of States having completed implementation of SSP Phase 1	a. 5 States by the end of 2014; b. 10 States by the end of 2015; and c. all the 15 MID States by the end of 2016.
		Number of States having completed implementation of SSP Phase 2	a. 5 States by the end of 2015; b. 10 States by the end of 2016; and c. all the 15 MID States by the end of 2017.
		Number of States having completed implementation of SSP Phase 3	a. 5 States by the end of 2016; b. 10 States by the end of 2017; and c. All the 15 MID States by the end of 2018.
		Number of Service Providers having completed implementation of SMS Phase 1, as a percentage of all service providers required to implement SMS	a. 40% of the service providers having completed implementation of SMS Phase 1 by the end of 2014; b. 75% of the service providers having completed implementation of SMS Phase 1 by the end of 2015; and c. all the service providers having completed implementation of SMS Phase 1 by the end of 2016
		Number of Service Providers having completed implementation of SMS Phase 2, as a percentage of all service providers required	a. 40% of the service providers having completed implementation of SMS Phase 2 by the end of 2015; b. 75% of the service providers

		to implement SMS	having completed implementation of SMS Phase 2 by the end of 2016; and c. all the service providers having completed implementation of SMS Phase 2 by the end of 2016
		Number of Service Providers having completed implementation of SMS Phase 3, as a percentage of all service providers required to implement SMS.	a. 40% of the service providers having completed implementation of SMS Phase 3 by the end of 2016; b. 75% of the service providers having completed implementation of SMS Phase 3 by the end of 2017; and c. all the service providers having completed implementation of SMS Phase 3 by the end of 2018

Progress on the achievement of the agreed Safety Targets will be reported to the ICAO Air navigation Commission (ANC), through the review of the RASG-MID reports; and to the stakeholders in the Region during the MID Region Safety Summits.

Future editions of the Annual Safety Report will include such progress reports on Safety Targets.

2.2 Proactive Safety Information

A mature safety management system requires the integration of reactive, proactive and predictive safety data capture systems, a judicious combination of reactive, proactive and predictive mitigation strategies, and the development of reactive, proactive and predictive mitigation methods.

This section of the Annual Safety Report focuses on proactive safety data analysis to identify Focus Areas that form the basis for the development of Safety Enhancement Initiatives (SEIs) and Detailed Implementation Plans (DIPs) under RASG-MID.

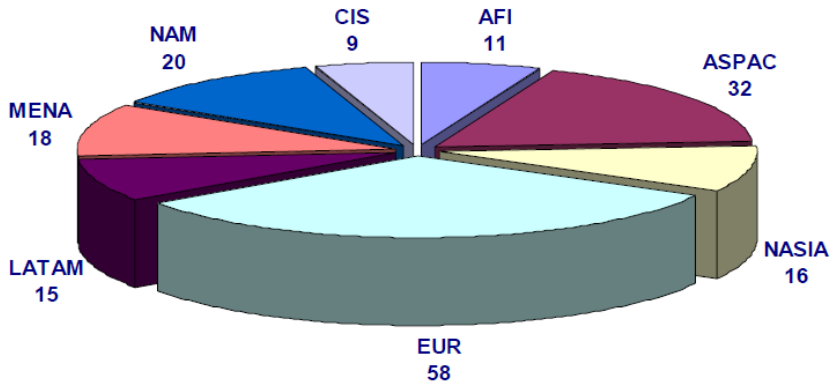
2.2.1 Analysis of Audits

2.2.1.1 IATA Operational Safety Audit (IOSA)

The IOSA audit results analysis captured under this section cover the period between July 2009 and December 2010.

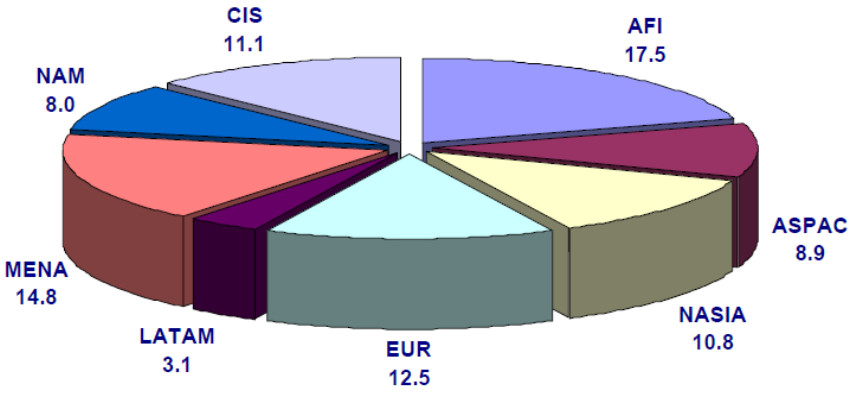
Total number of captured reports is 179 distributed in the regions as follows;

Region	Reports
EUR	58
ASPAC	32
MENA	18
NAM	20
AFI	11
NASIA	16
LATAM	15
CIS	9

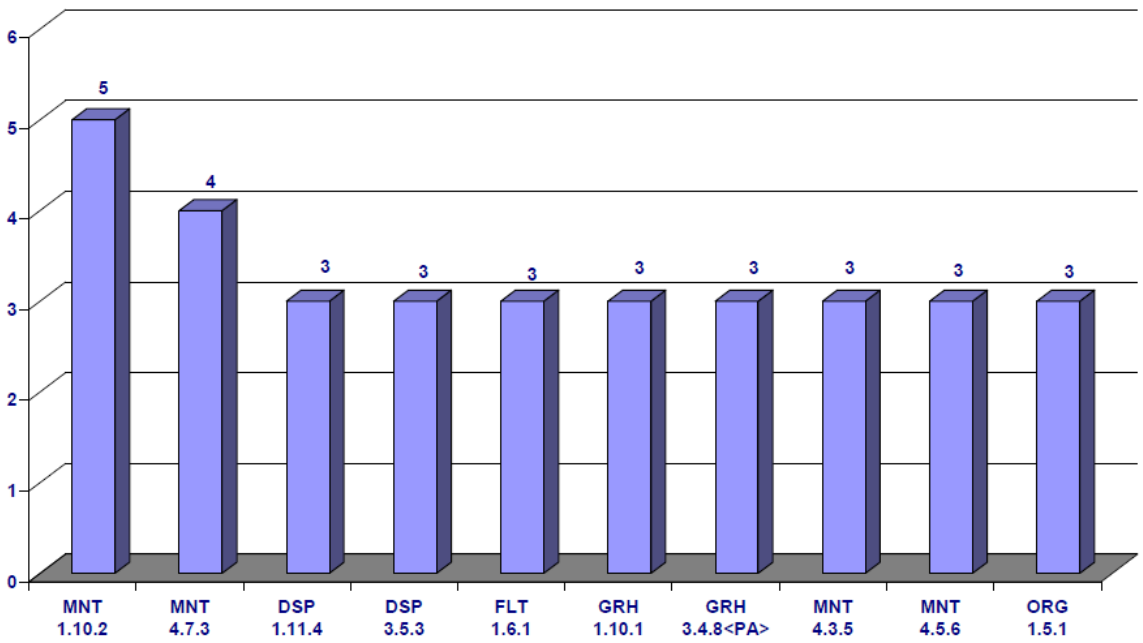


Average findings per audit per region are as follows;

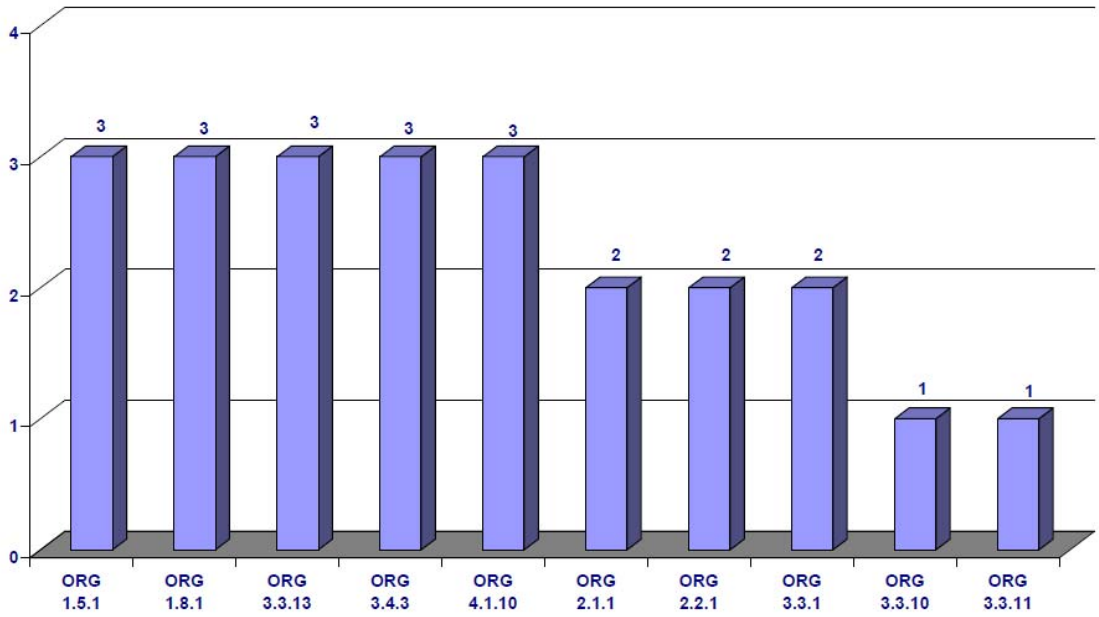
Region	Ave. Findings per Audit
EUR	12.5
ASPAC	8.9
MENA	14.8
NAM	8.0
AFI	17.5
NASIA	10.8
LATAM	3.1
CIS	11.1



In specific and for the Middle East and North Africa (MENA) region, 18 audits are considered in this analysis. Overall performance is shown in the following chart;



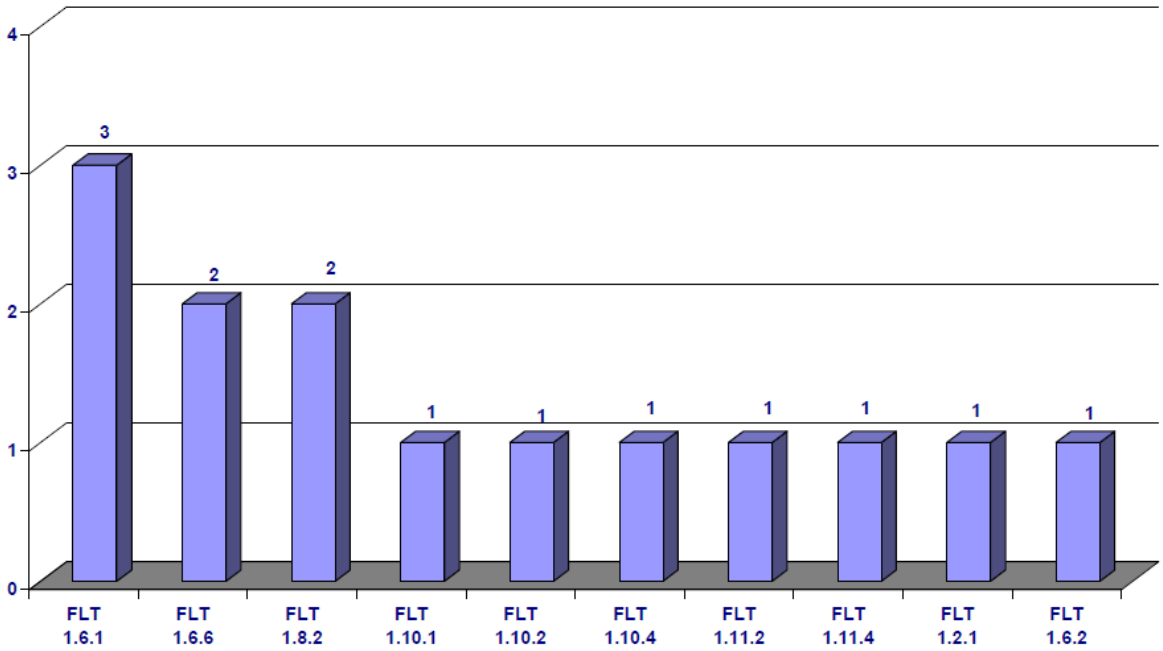
In specific and under **Organization and Management System (ORG)** the following are the main findings;



The top 5 areas where non-conformance was recorded are;

1. ORG 1.5.1: Review of Management System
2. ORG 1.8.1: Planning process for operations within the Management System
3. ORG 3.3.13: Flight Data Analysis (FDA) system
4. ORG 3.4.3: Addressing findings from audits
5. ORG 4.1.10: Process for accurate manifest submission in the case of an accident

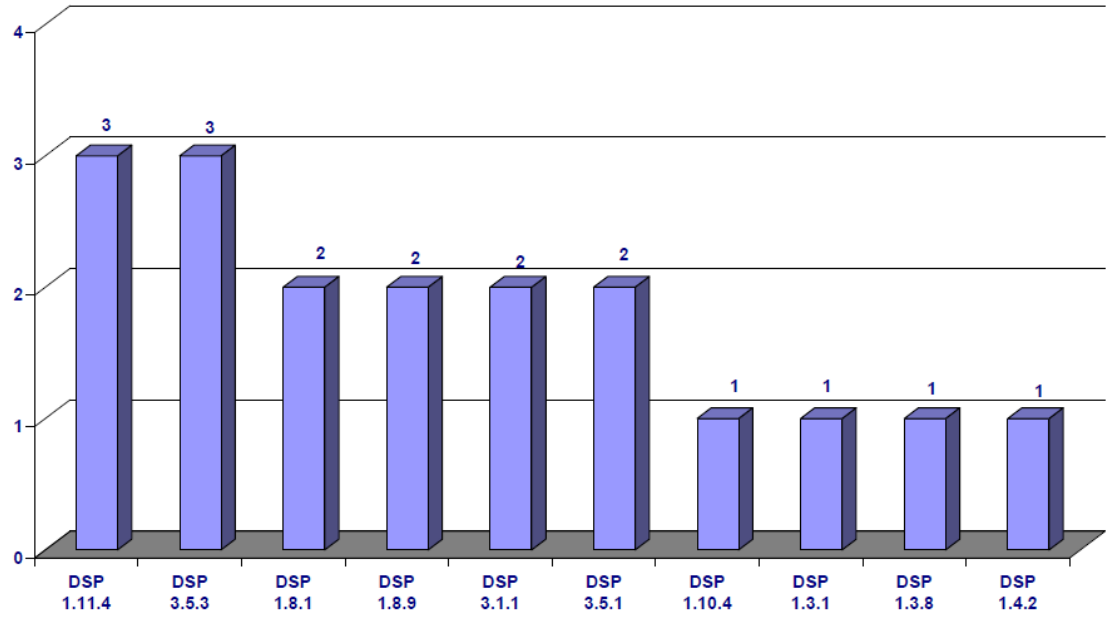
Under **Flight Operations (FLT)** the following chart indicates the main findings recorded;



The top three non-conformance areas are:

1. FLT 1.6.1: System for management and control of flights operations documents and/or data
2. FLT 1.6.6: On-board library
3. FLT 1.8.2: Flight operations records control

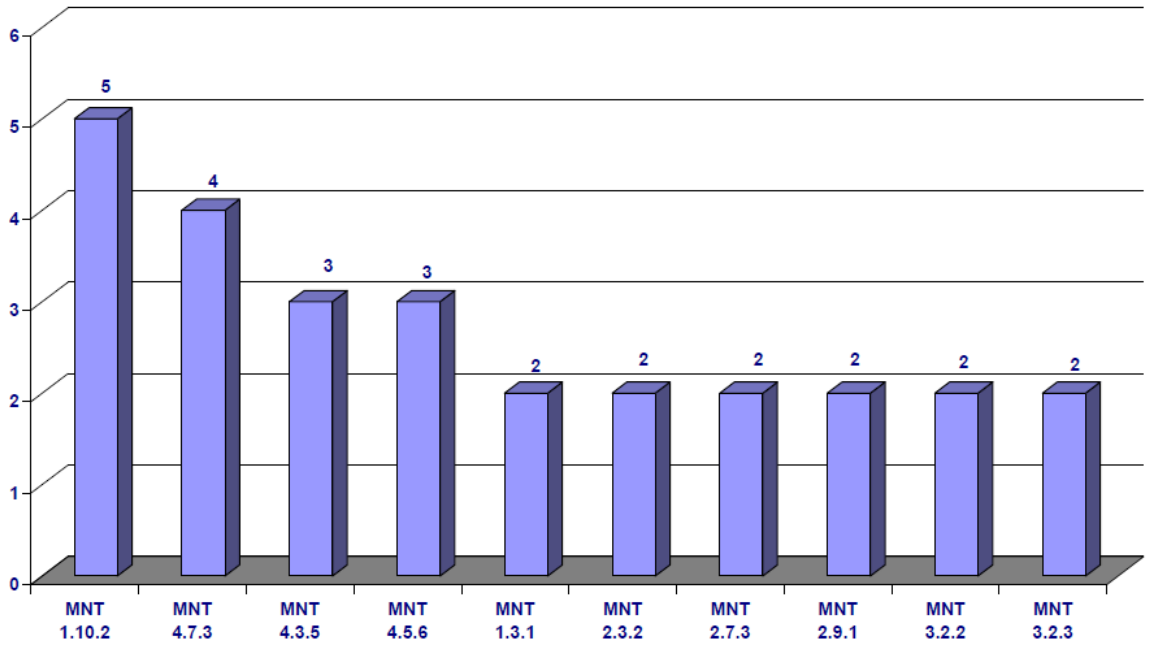
In the area of **Operational Control and Flight Dispatch (DSP)** the following findings were recorded;



The top three non-conformance areas are;

1. DSP 1.11.4: Process for approval and acceptance of electronic navigation data by State
2. DSP 3.5.3: Selection of en-route alternate airports
3. DSP 1.8.1: Management and control of operational control records

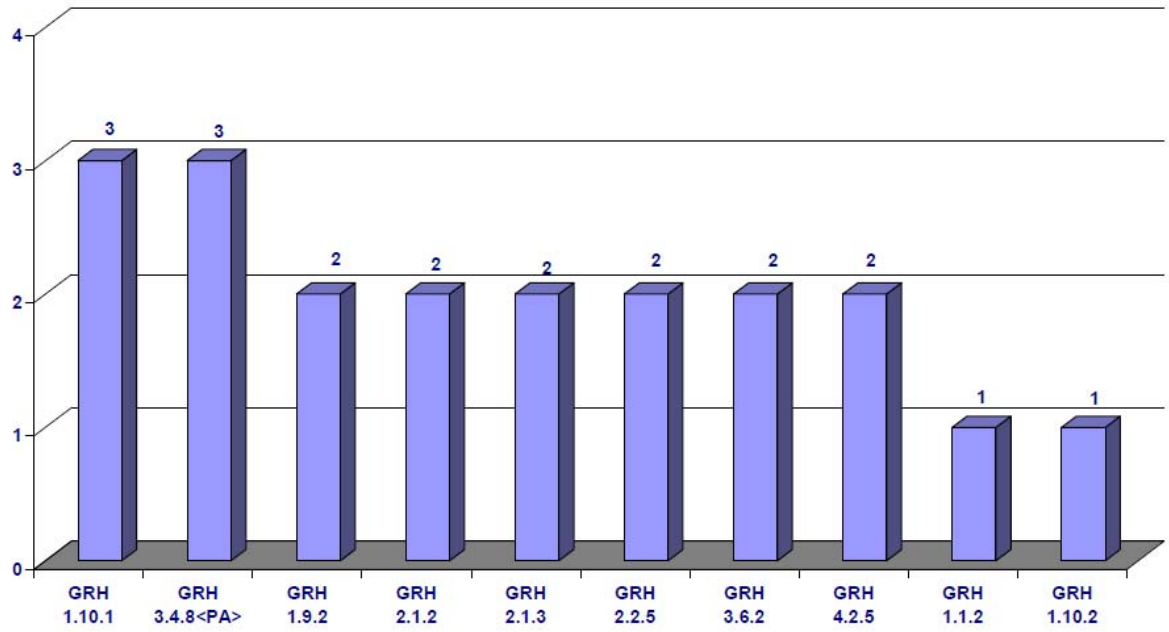
In the area of **Maintenance (MNT)** the following findings were recorded;



The top five non-conformance areas are;

1. MNT 1.10.2: Process for addressing findings and results of audits
2. MNT 4.7.3: Electrostatic Sensitive Devices (ESD) systems by contracted maintenance organizations
3. MNT 4.3.5: QA Program for contracted maintenance organizations
4. MNT 4.5.6: Training program for contracted maintenance organizations
5. MNT 1.3.1: Approved Maintenance Program

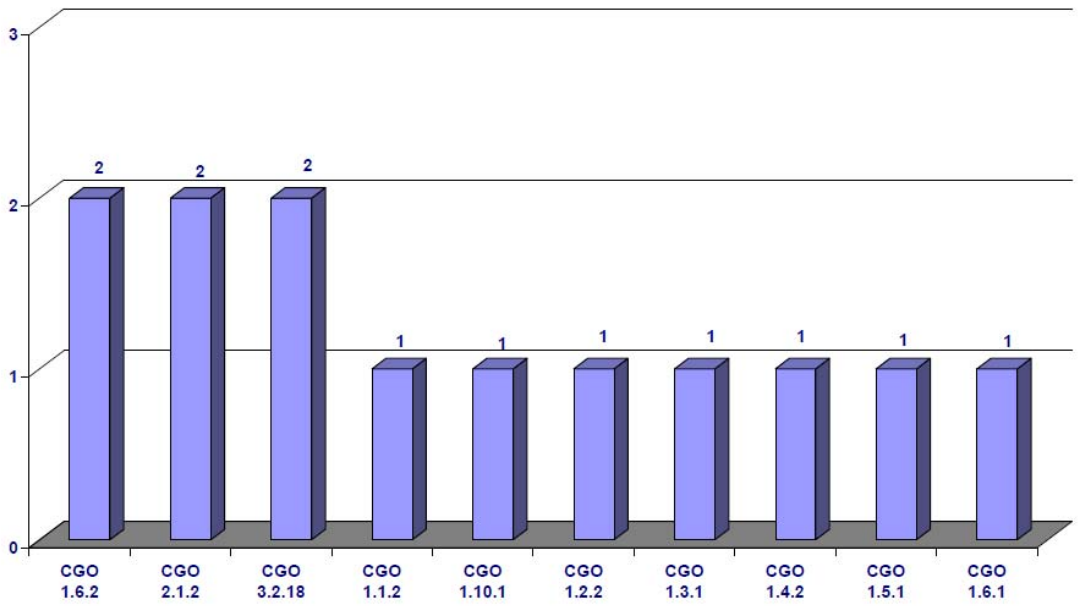
In the area of **Ground Handling (GRH)**, the following findings were recorded;



The top three non-conformance areas are in the following;

1. GRH 1.10.1: Control of agreements with ground handling service providers
2. GRH 3.4.8: Prevention of “Cargo Only” shipments from being transported on passengers flights
3. GRH 1.9.2: Process for addressing findings and results from audits

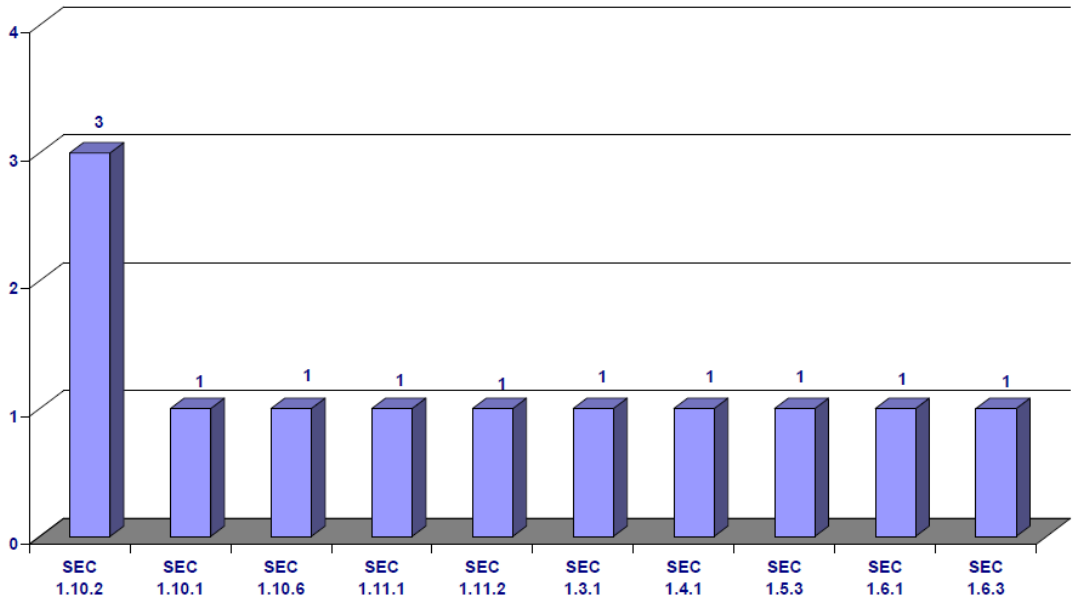
In the area of **Cargo Operations (CGO)**, the following findings were recorded;



The top three non-conformance areas are as follows;

1. CGO 1.6.2: Availability of IATA DGR Manual
2. CGO 2.1.2: Training program control
3. CGO 3.2.18: Control of undeclared or mis-declared dangerous goods

In the area of **Aviation Security (SEC)** the following findings were recorded;



The top two non-conformance areas are as follows:

1. SEC 1.10.2: Process for addressing findings and results from audits
2. SEC 1.10.1: QA system to evaluate security functions

Summary and main focus areas;

Non-conformance with standards related to addressing findings and results from audits is recurrent for MENA in the areas of ORG, MNT, GRH, and SEC.

Considering the Safety Performance Areas and proposed Best Practices under the new GASP, the following can be used to support the development of SEIs/DIPS in this deficiency area;

1. BP-GEN-4:

ICAO, States and industry identify areas where best practice implementation is problematic.

a) Regulatory Authorities and each sector of the industry use audit and other safety information available to identify areas where best practices are not followed uniformly.
b) Coordination exists between regulatory authorities and industry stakeholders to implement best practices.

2. BP-GEN-5:

Stakeholders establish internal and independent audit processes for their organizations and all subcontractors of safety related operations to ensure best practice compliance.

a) Internal audits are conducted as an integral part of the organization‘s strategic planning review process
b) External independent auditing is conducted through the use of recognized and accepted audit processes such as USOAP and IOSA.
c) Audits include IOSA, LOSA, Regulatory Authorities‘ audits and internal audits. They also include the output of self -disclosure reporting programmes and flight data acquisition programmes. They additionally include reviews of comparable audits of any external organization, which performs a safety related function as a sub-contractor of the organization, such as an independent maintenance and repair organization
d) Deficiencies in best practice implementation are corrected. An organization seeks appropriate assistance in correcting any such deficiencies if necessary.

The top non-conformances areas are;

1. System for Flight Data Analysis (FDA)

2. Control of flight operations documents

3. Process for approval and acceptance of electronic navigation data

4. Control of agreements with contracted ground service providers

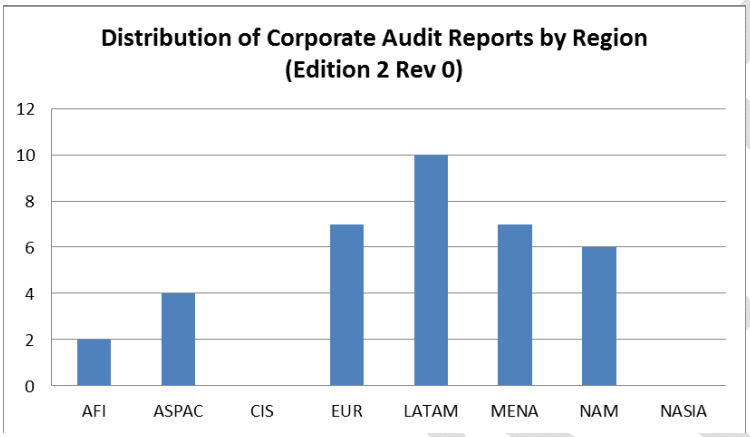
5. Handling of Dangerous Goods

2.2.1.2 IATA Safety Audit for Ground Operations (ISAGO)

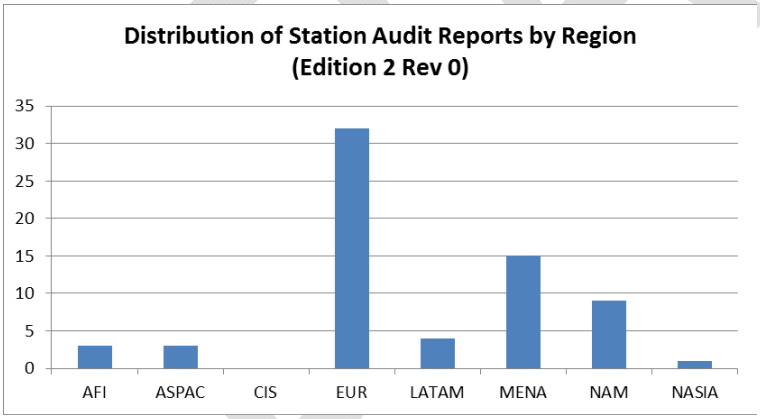
The ISAGO audit results analysis captured under this section cover the period between May 2010 and January 2012.

A total of 131 audit reports (36 corporate, 28 combined and 67 station) have been included in the analysis covering all 8 IATA regions. The 131 audits resulted in 213 findings coming from corporate audits, 579 findings coming from station audits and 546 findings coming from combined audits.

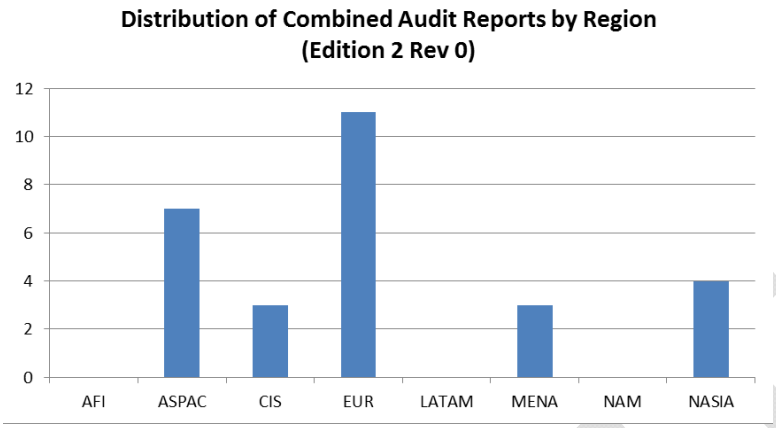
Corporate Audits:



Station Audit:

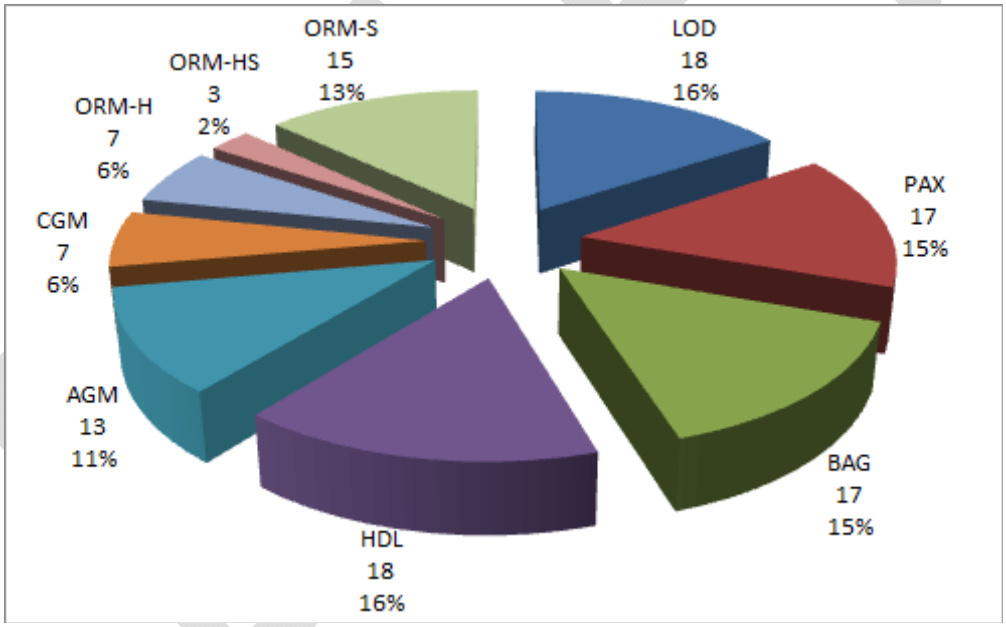


Combined Audits:

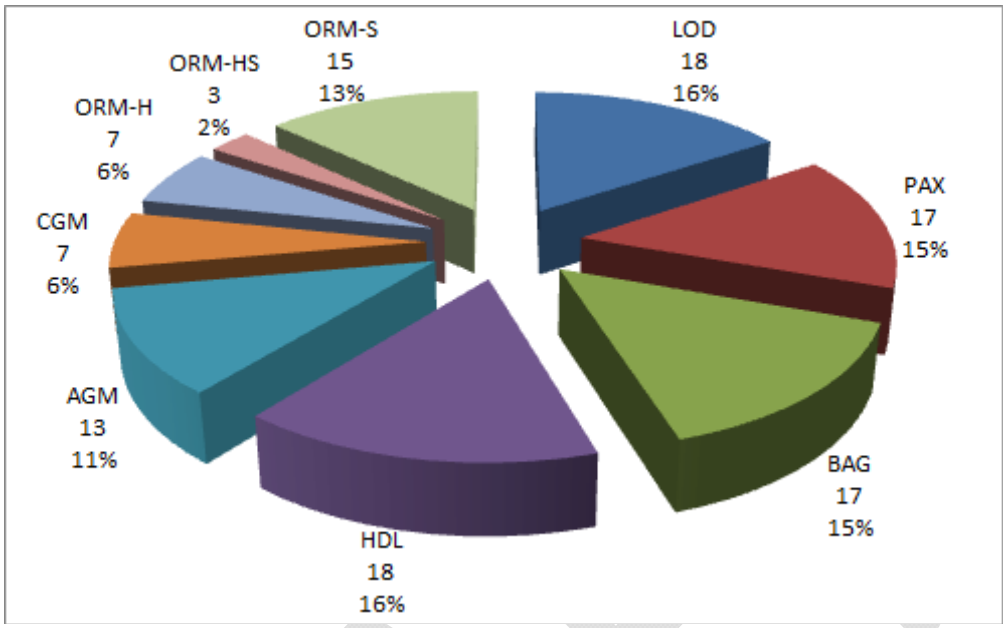


Distribution of Findings for MENA:

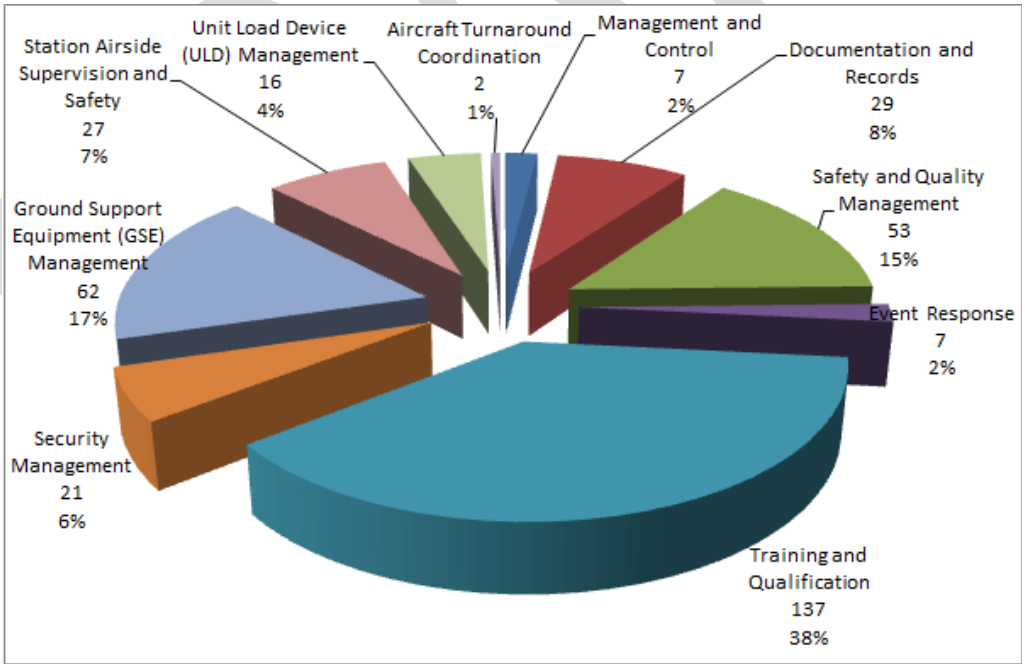
1) Overall Disciplines



2) Organization and Management – Corporate (ORM-H)



3) Organization and Management – Outstations (ORM-S)

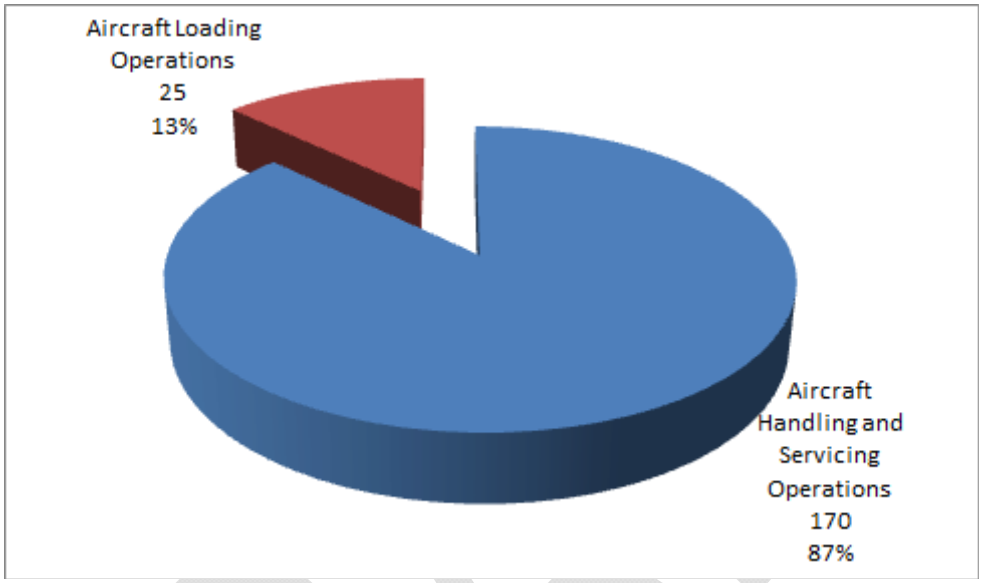


4) Load Control (LOD)

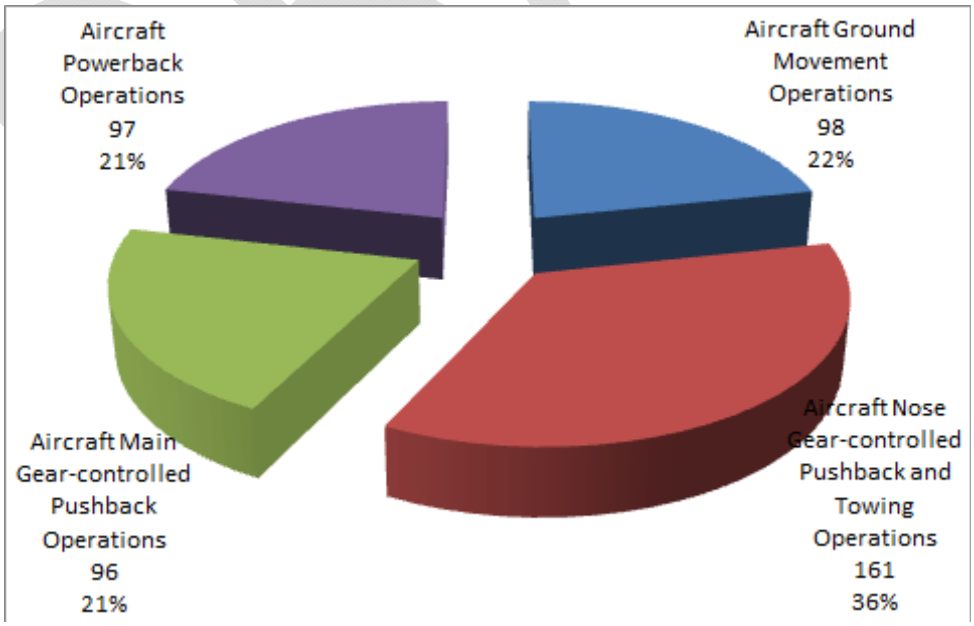
The top finding under LOD is related to load sheet completion;

LOD 1.6.5 The Provider shall ensure the Load sheet, when transmitted to the aircraft via ACARS, is in a standard format that is in accordance with requirements of the customer airline(s).

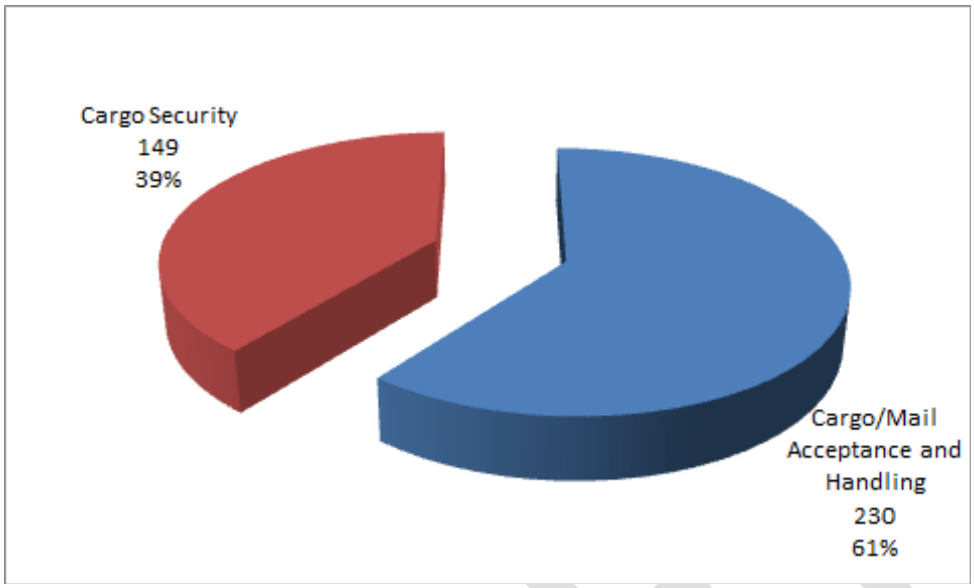
5) Aircraft Handling and Loading (HDL)



6) Aircraft Ground Movement (AGM)



7) Cargo and Mail Handling (CGM)



For the purpose of this analysis, the top two non-conformance areas are taken into consideration;

- LOD – 16% findings

  Top non-conformance was with the standard LOD 1.6.5 stating that the Provider shall ensure the Load sheet, when transmitted to the aircraft via ACARS, is in a standard format that is in accordance with requirements of the customer airline(s).

- HDL – 16% findings

  87% of the findings were related to aircraft handling and servicing operations.

  Top 10 findings are related to passengers boarding bridge handling and usage and aircraft/apron security.

2.2.1.3 USOAP-CMA

The results of the ICAO Universal Safety Oversight Audit Programme (USOAP) are presented to either show the lack of effective implementation (LEI) in reference to the eight critical elements (CEs) of the State's Safety Oversight System (Figure X1) or the LEI per Audit Areas (Figure X2). The highest LEI remains in CE4 (53%) related to Qualification and Training of Technical Staff involved in carrying out regulatory functions. Areas of PEL, OPS and AIR still show the lowest LEI in the MID Region.

Note: The LEI values may differ slightly from those published in the USOAP audit reports that were published from the period 2006 to 2010 due to changes in the LEI calculation algorithm as well as changes in the protocol question grouping structure performed since the State's audit.

Figure X1 – Lack of Effective Implementation (LEI) per Critical Element (CE)

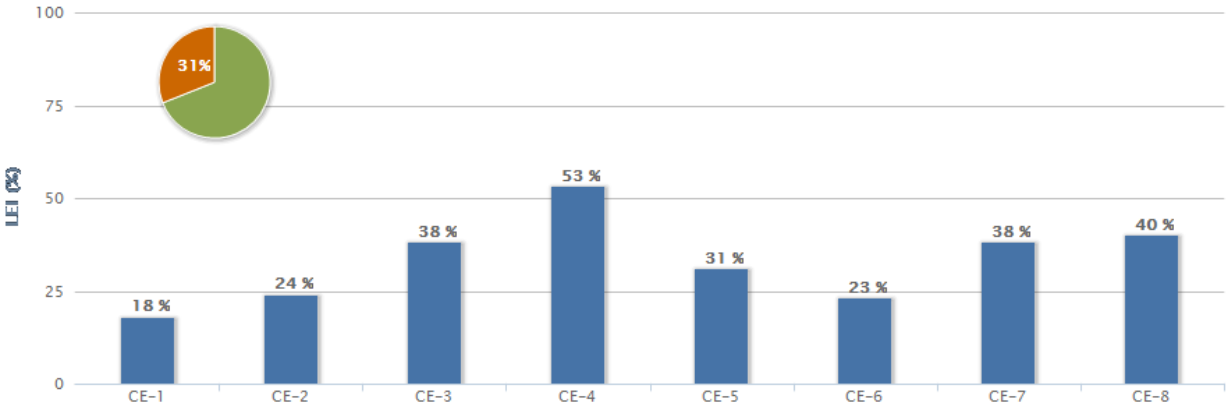
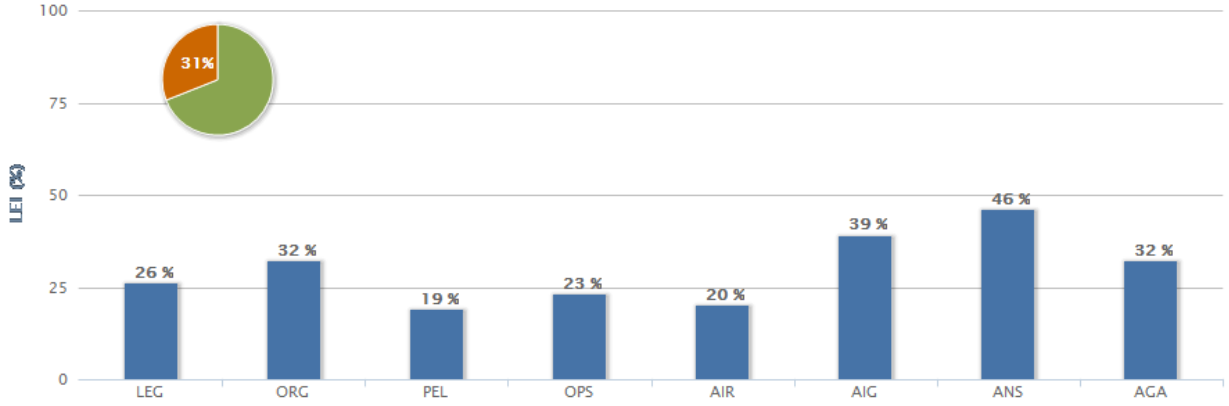
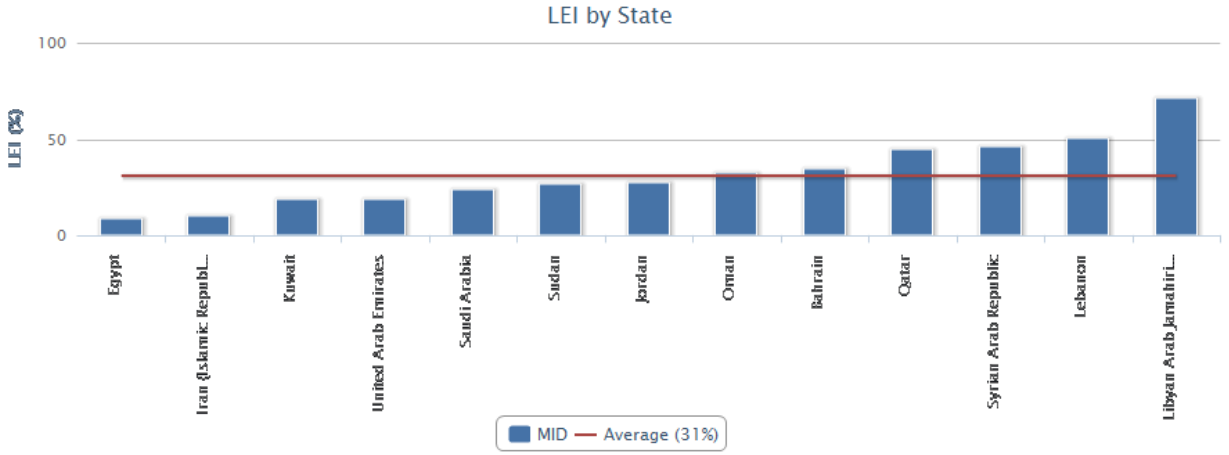


Figure X2 – Lack of Effective Implementation (LEI) per Audit Area



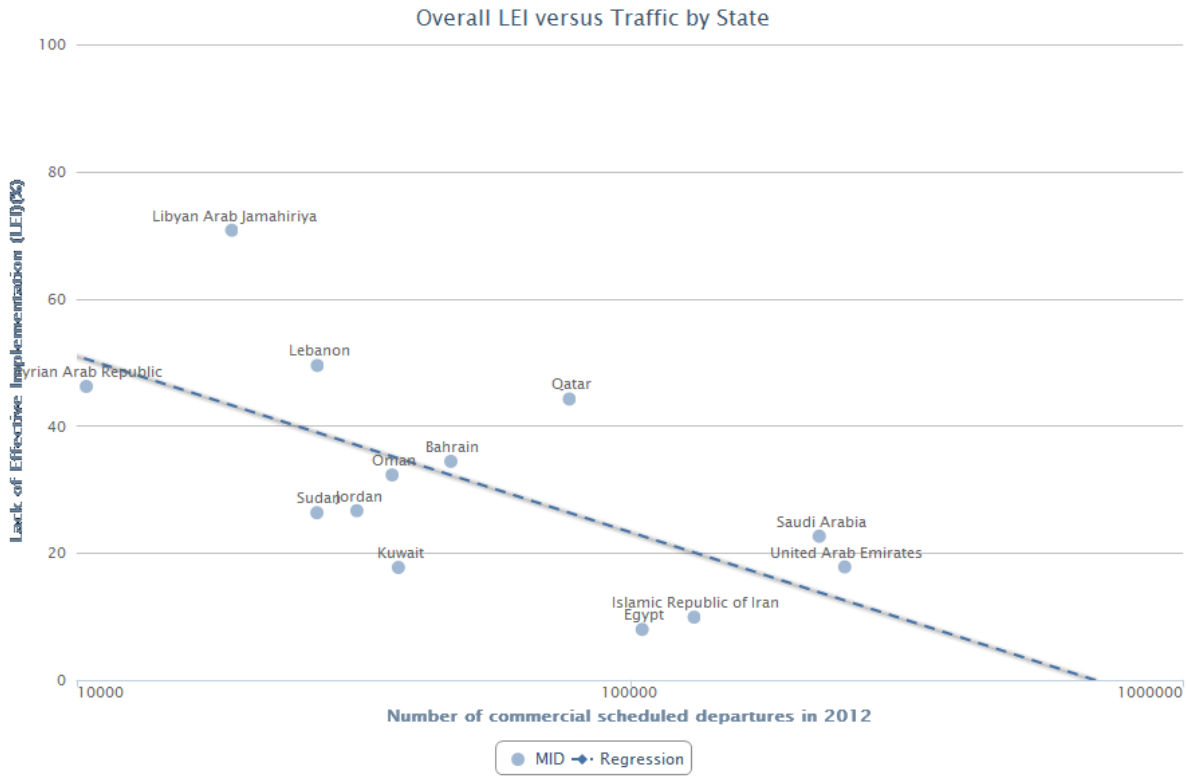
The average LEI in the MID Region is 31%, which is below the world average 39% (Figure X3, only 13 States have been audited). As the CMA officially launched in January 2013, the LEI is continuously updated to reflect results from CMA activities including the ICAO Coordinated Validation Missions (ICVMs).

Figure X3 – Lack of Effective Implementation (LEI) by State



Level of air traffic in the State is one of the safety risk indicators considered by CMA in determining the safety risk profile. Figure X4 shows LEI versus commercial scheduled departures in 2012 per State in the MID Region.

Figure X4 – LEI versus commercial scheduled departures in 2012



The below charts (Figure X5 and Figure X6) overlays accidents and fatalities data available on iSTARS, using USOAP audit data as a background and cumulative data of accidents and fatalities factors in the foreground.

Figure X5 – LEI and Accidents Factor in the MID Region

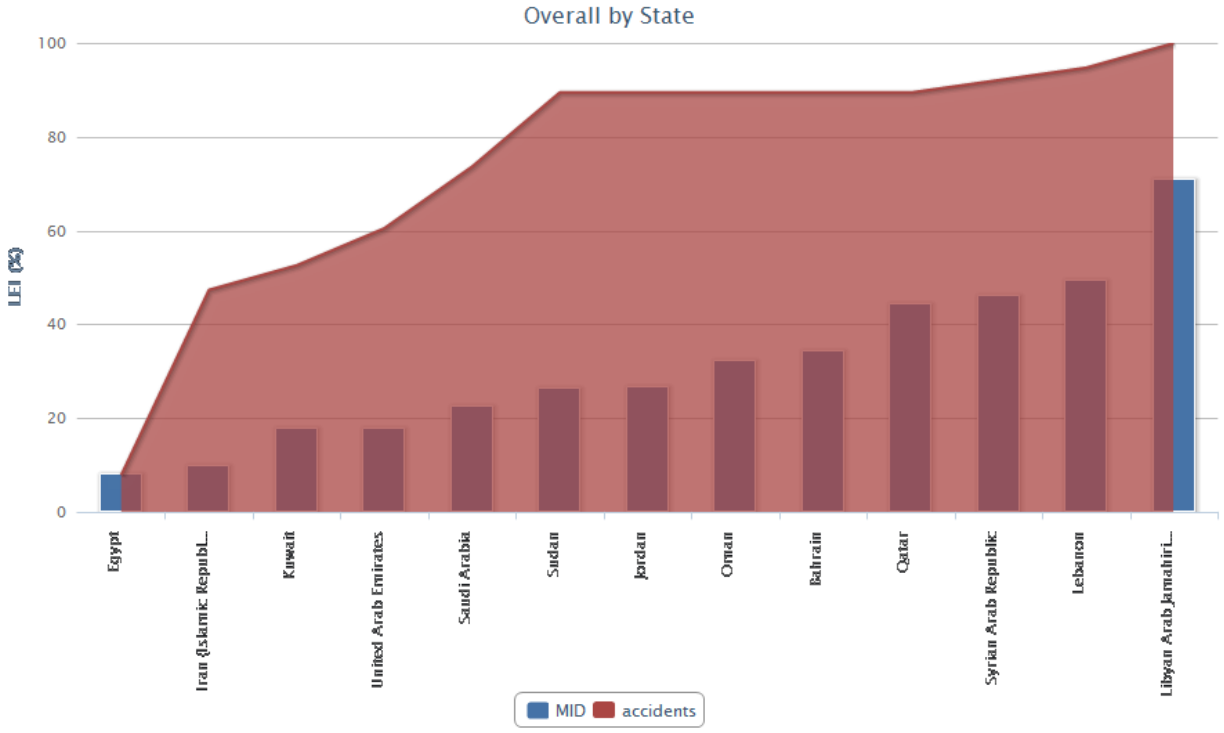
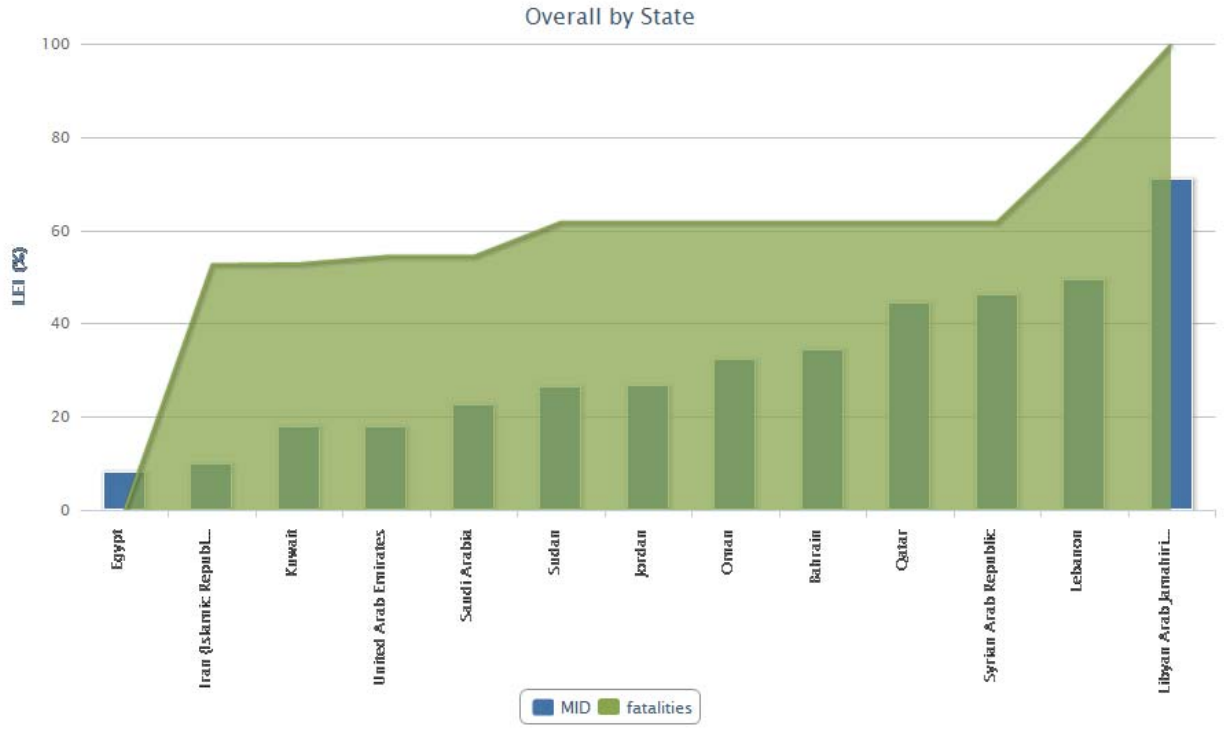


Figure X6 – LEI and Fatalities Factor in the MID Region



2.2.2 Analysis of incidents and occurrences

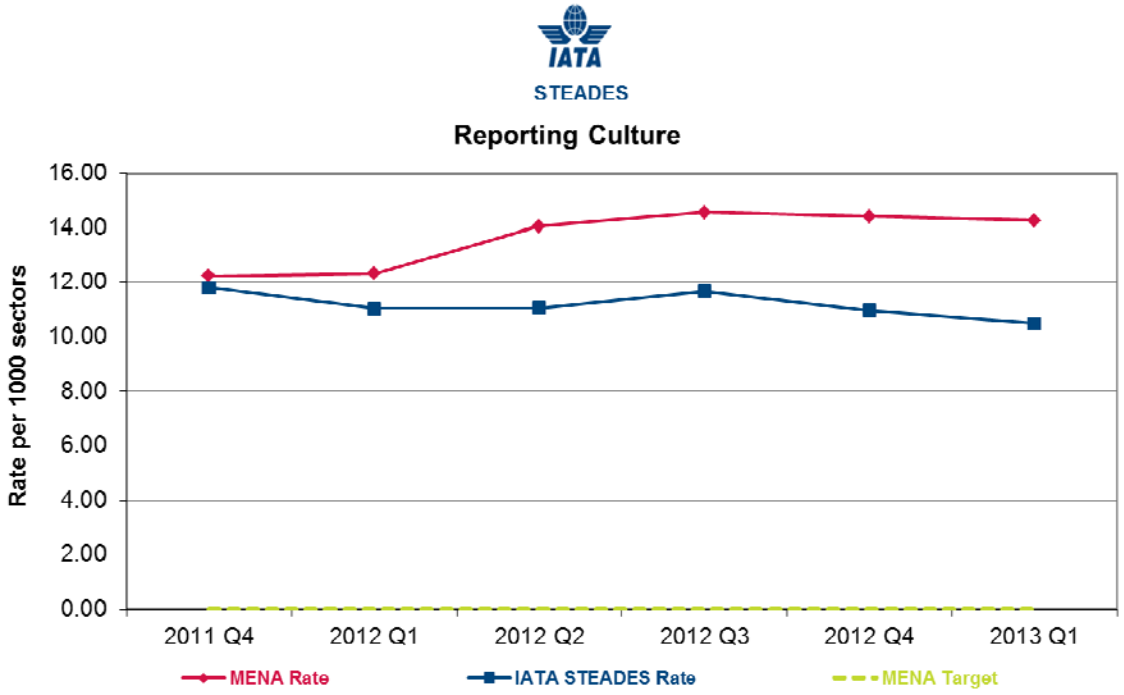
2.2.2.1 STEADES data

The Safety Trend Evaluation, Analysis & Data Exchange System (STEADES) is IATA's aviation safety incident data management and analysis program. It is a database of de-identified airline incident reports. Safety trend analysis using STEADES is included in this report allows proactive safety mitigation, provides rates on key safety performance indicators, and helps to continuously assess and establish safety performance targets.

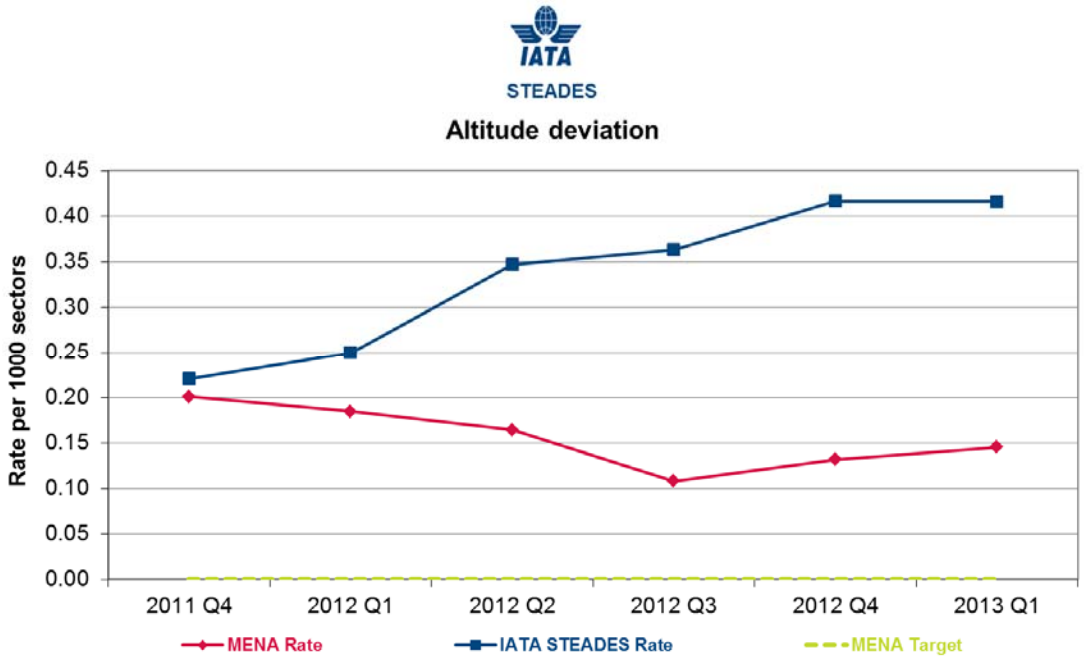
The scope of analysis captured in this report covers the period Q4 2011 to Q1 2013.

STEADES: Submitted reports	161,172
STEADES: Total Flights	14,436,436
% of total world flights	26.3%
MENA: Submitted reports	22,653
MENA: Total flights	1,222,283
% of STEADES' flights	8.5%

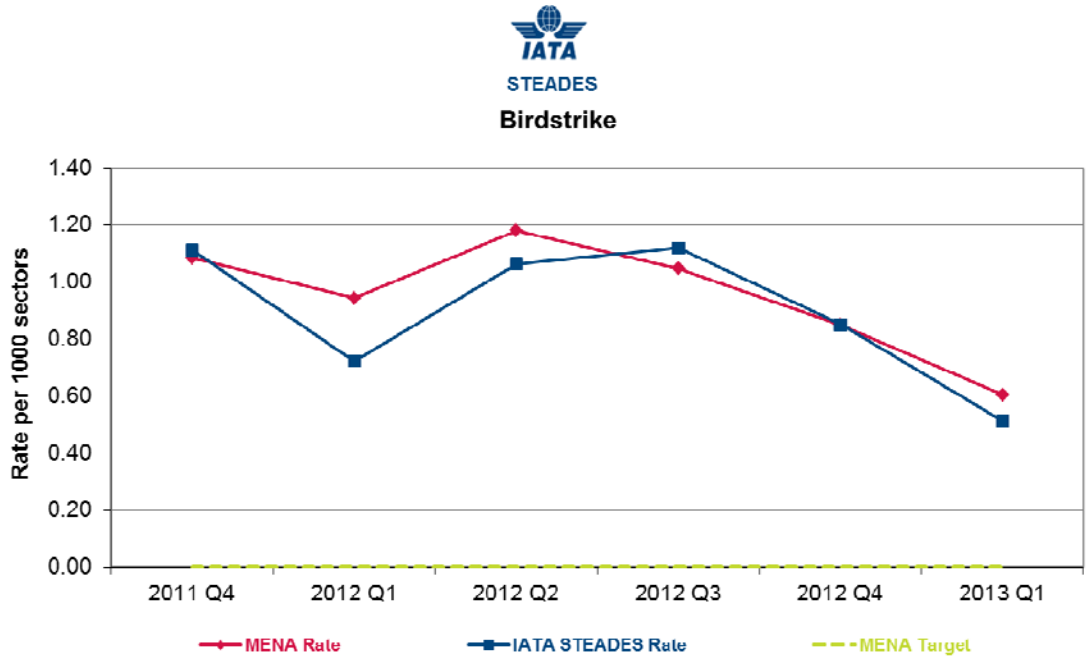
2.2.2.1.1 Reporting Culture



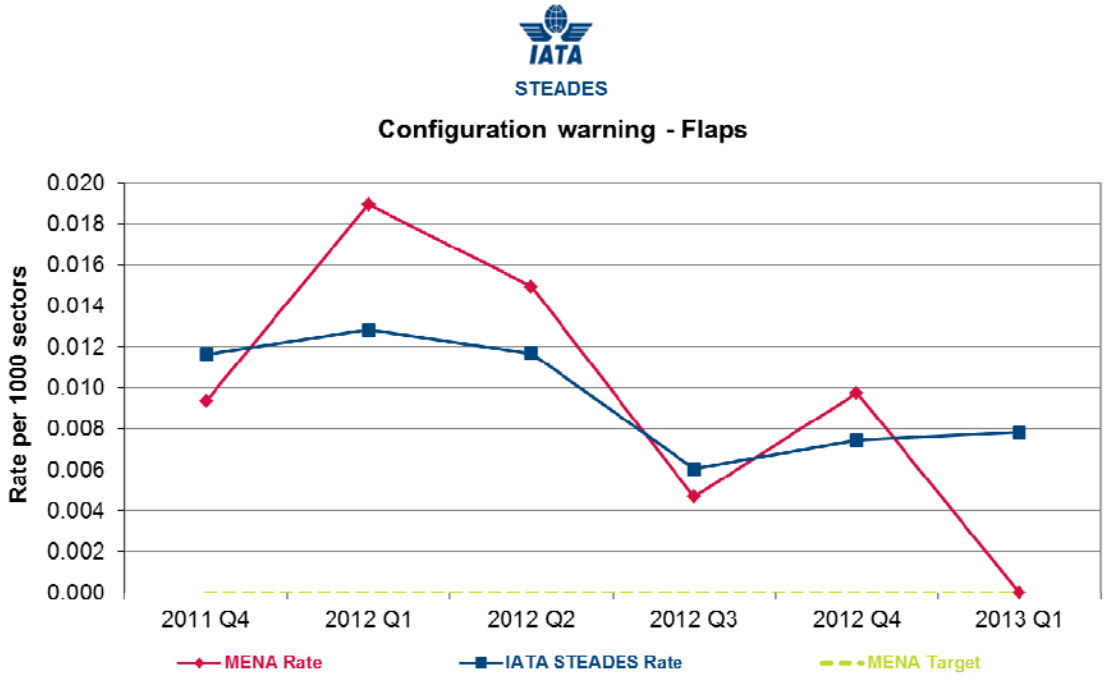
2.2.2.1.2 Altitude Deviation



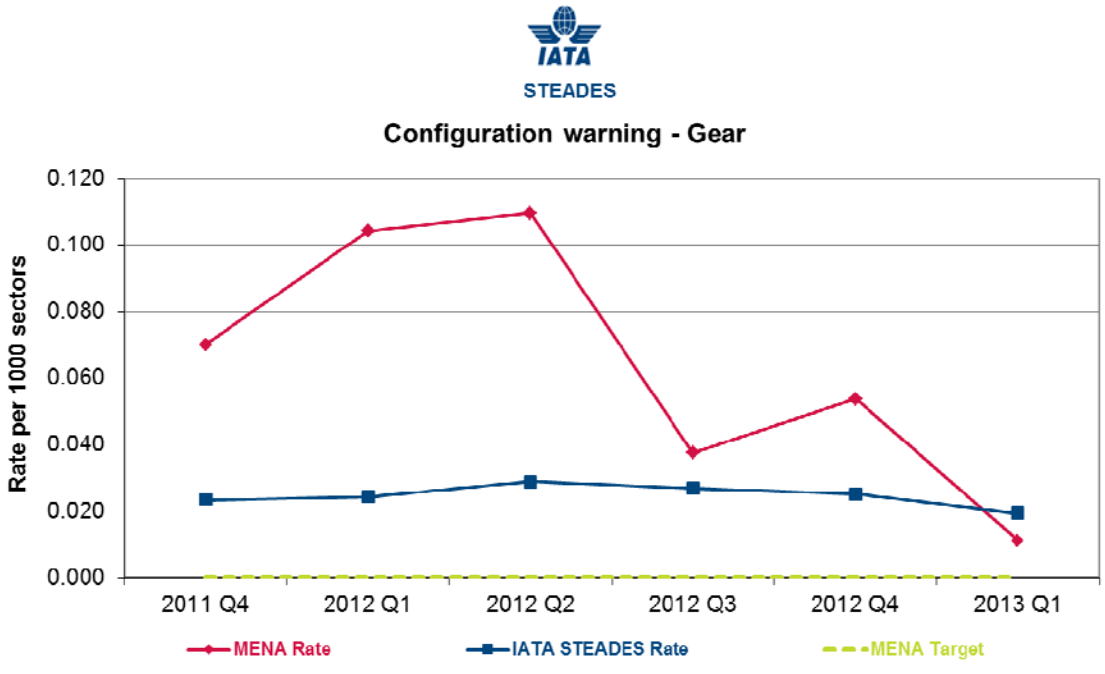
2.2.2.1.3 Birdstrike



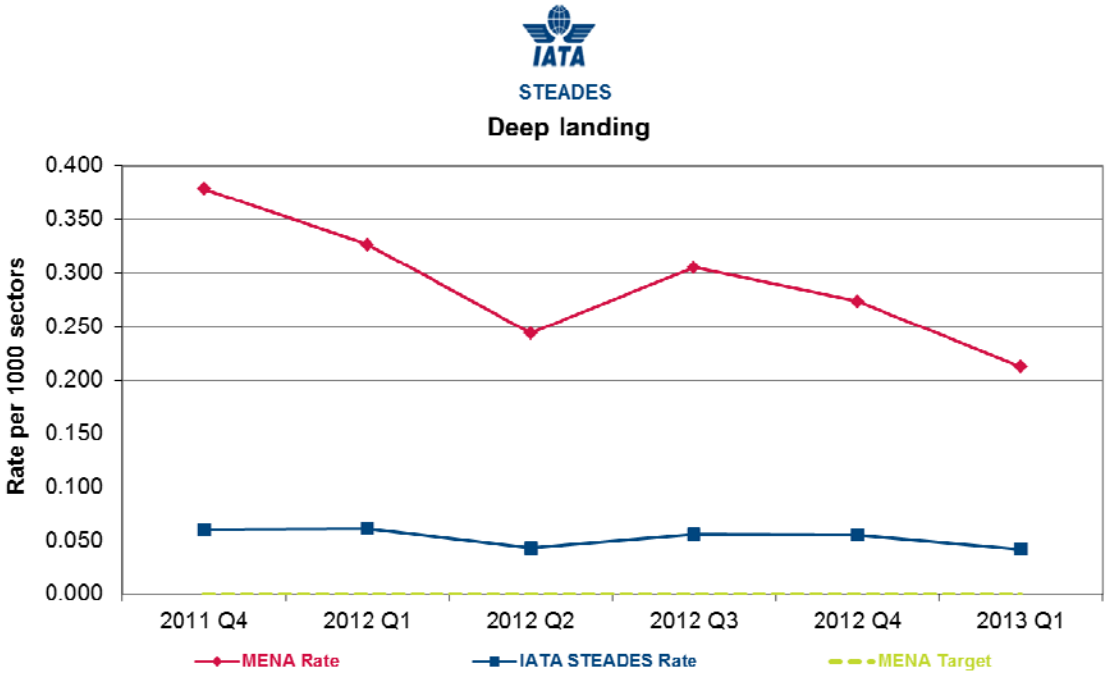
2.2.2.1.4 Configuration Warnings – Flaps



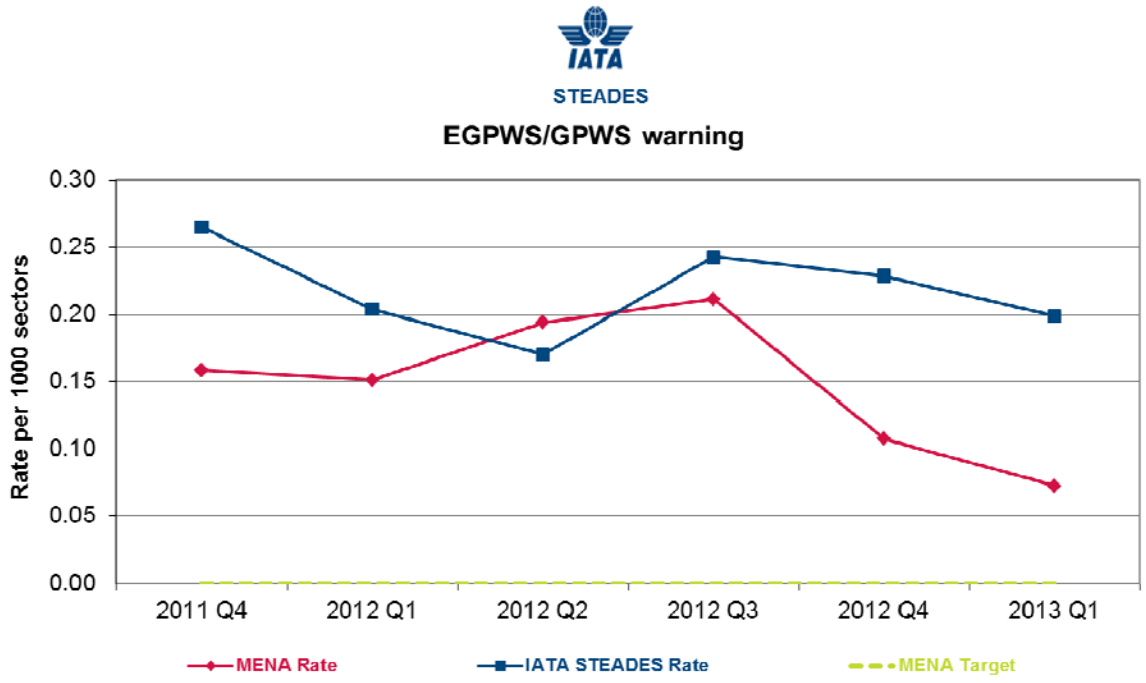
2.2.2.1.5 Configuration Warnings – Gear



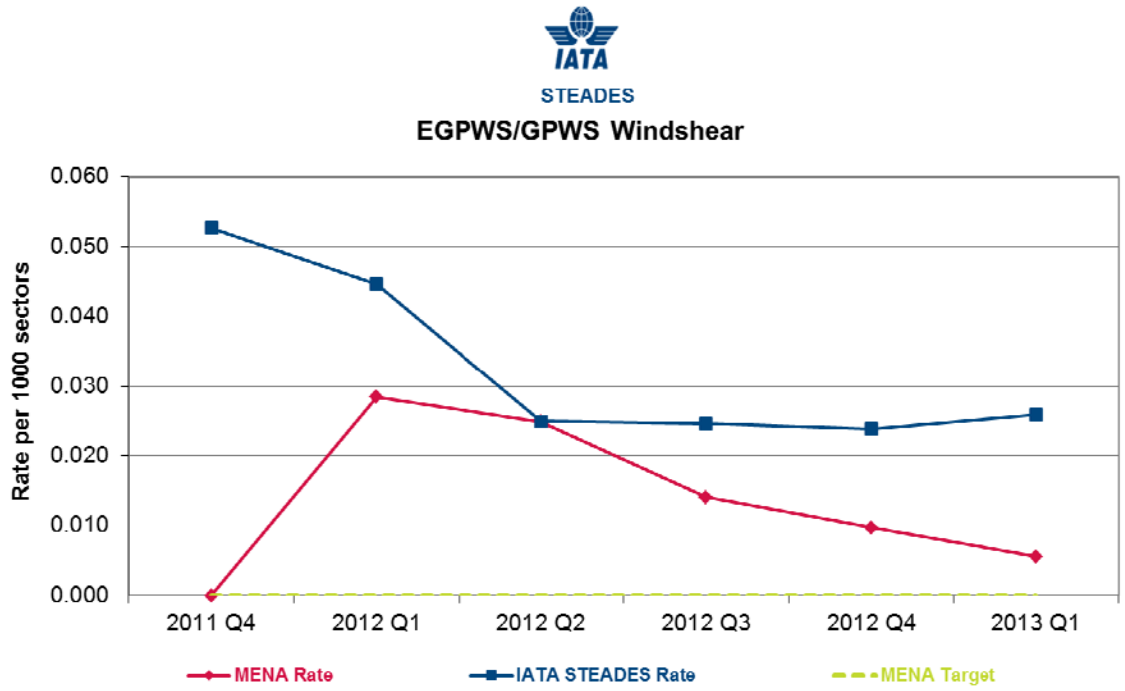
2.2.2.1.6 Deep Landing



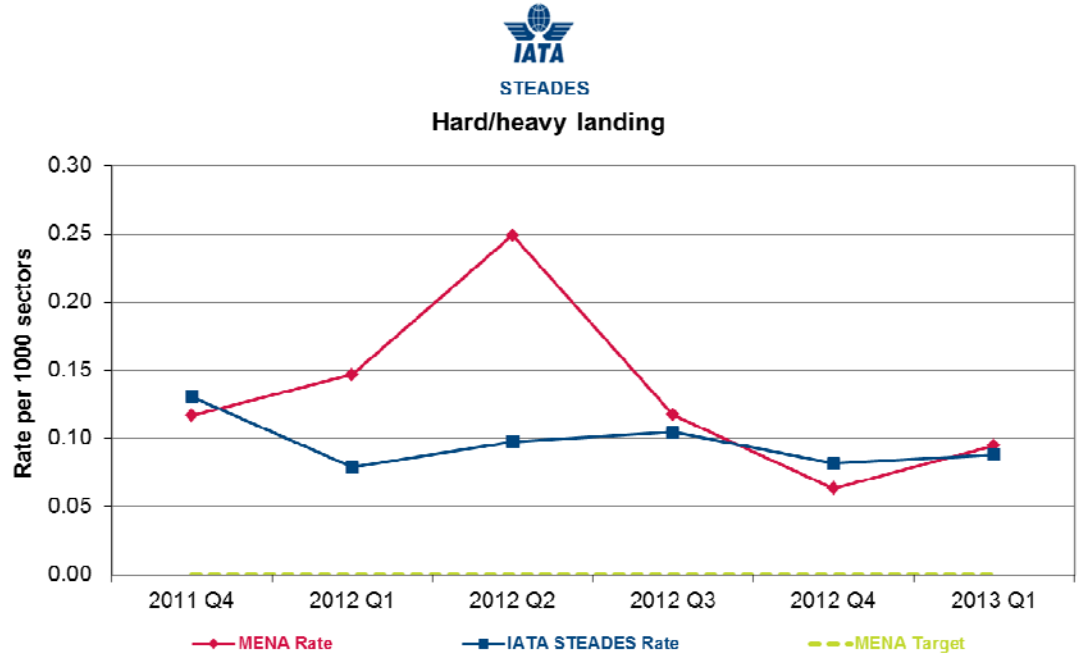
2.2.2.1.7 EGPWS/GPWS Warning



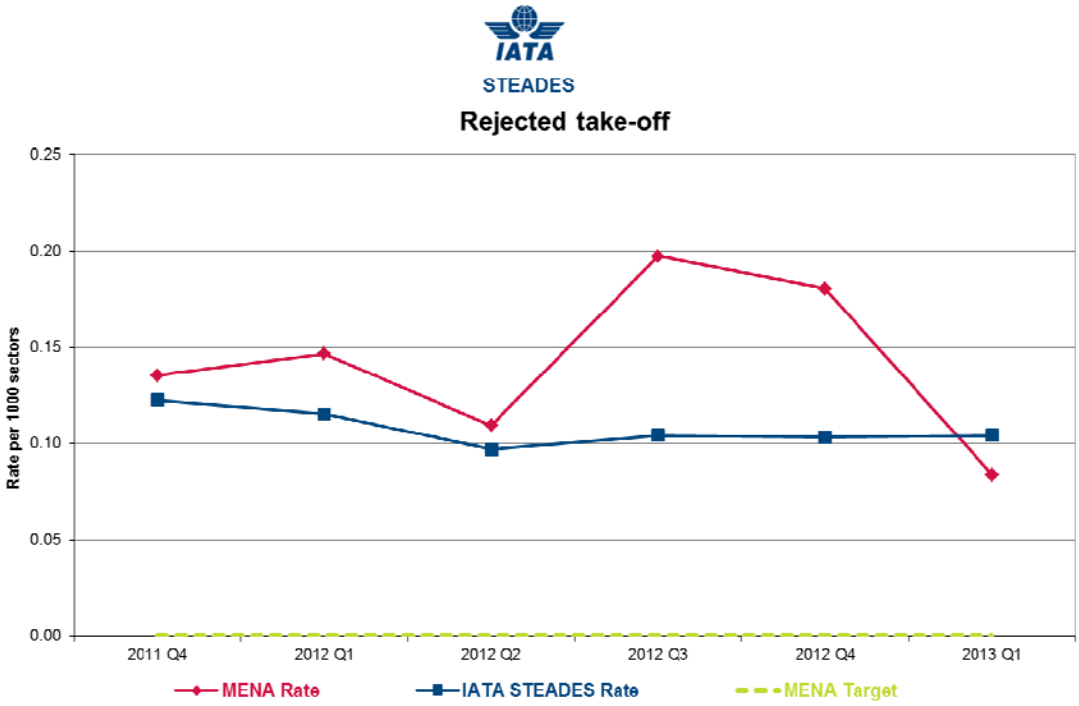
2.2.2.1.8 EGPWS/GPWS Windshear



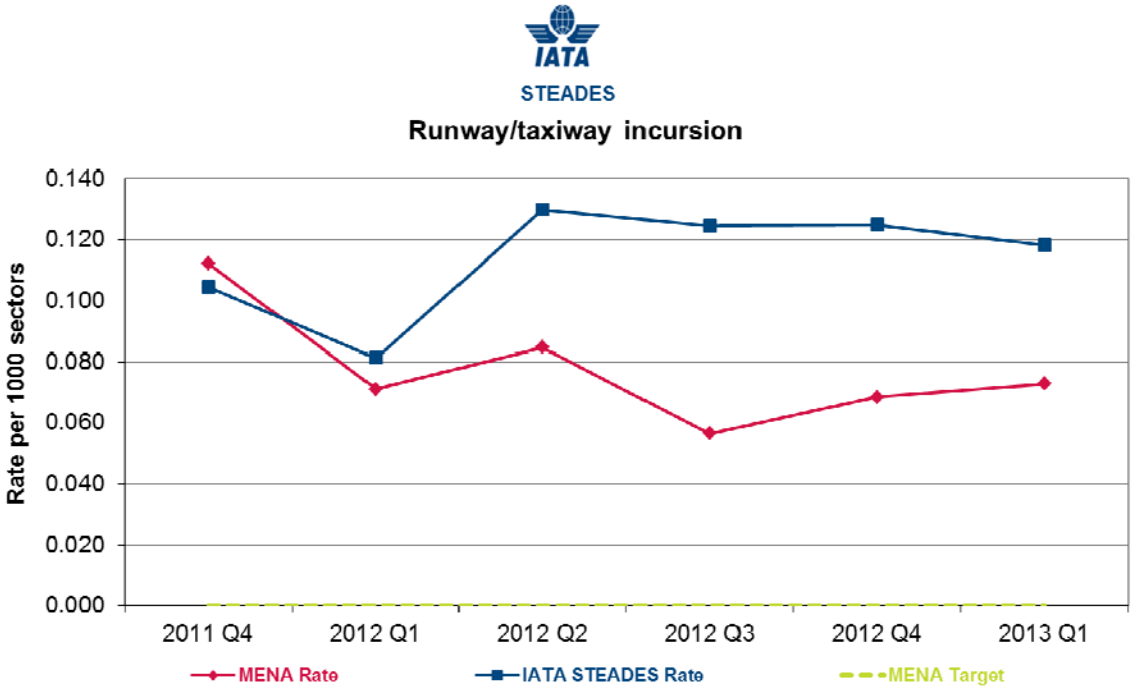
2.2.2.1.9 Head/Heavy Landing



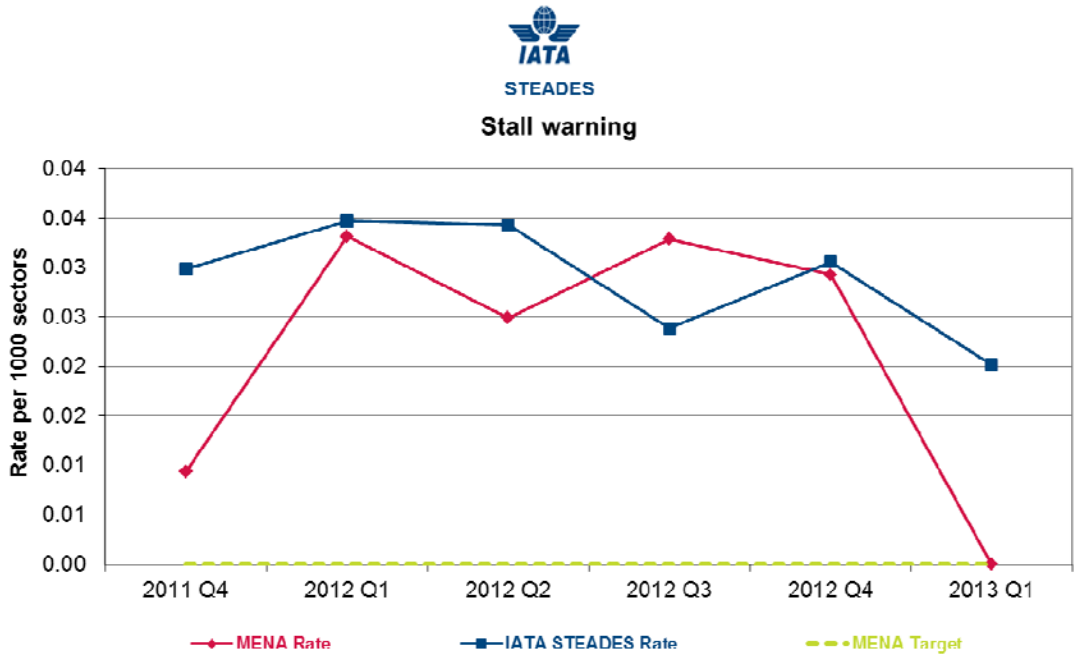
2.2.2.1.10 Rejected Take-off



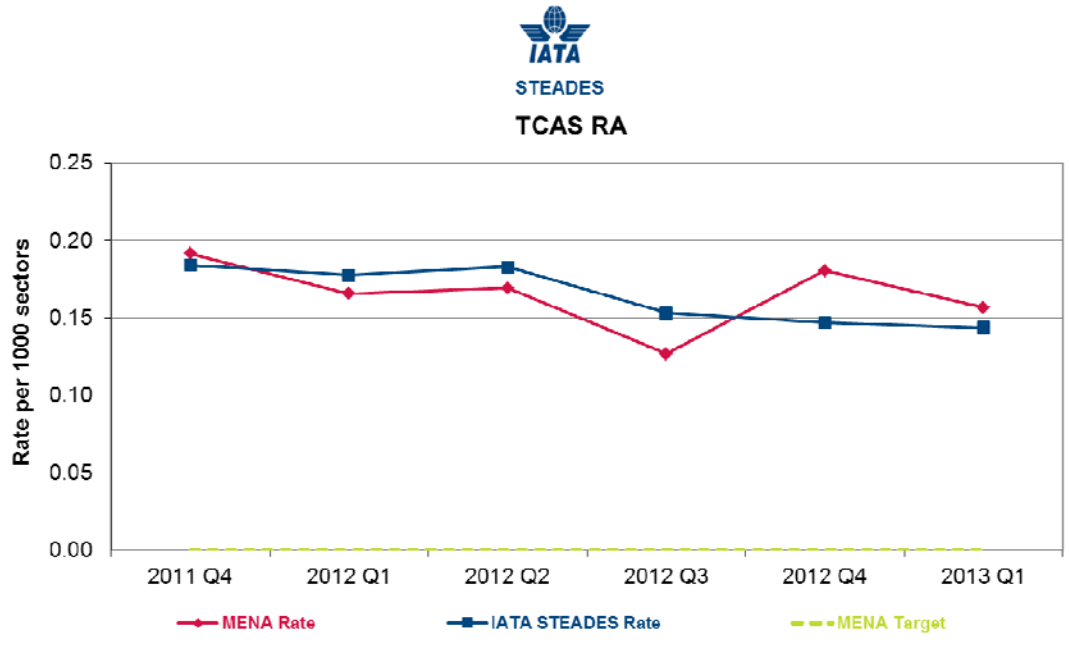
2.2.2.1.11 Runway/taxiway Incursion



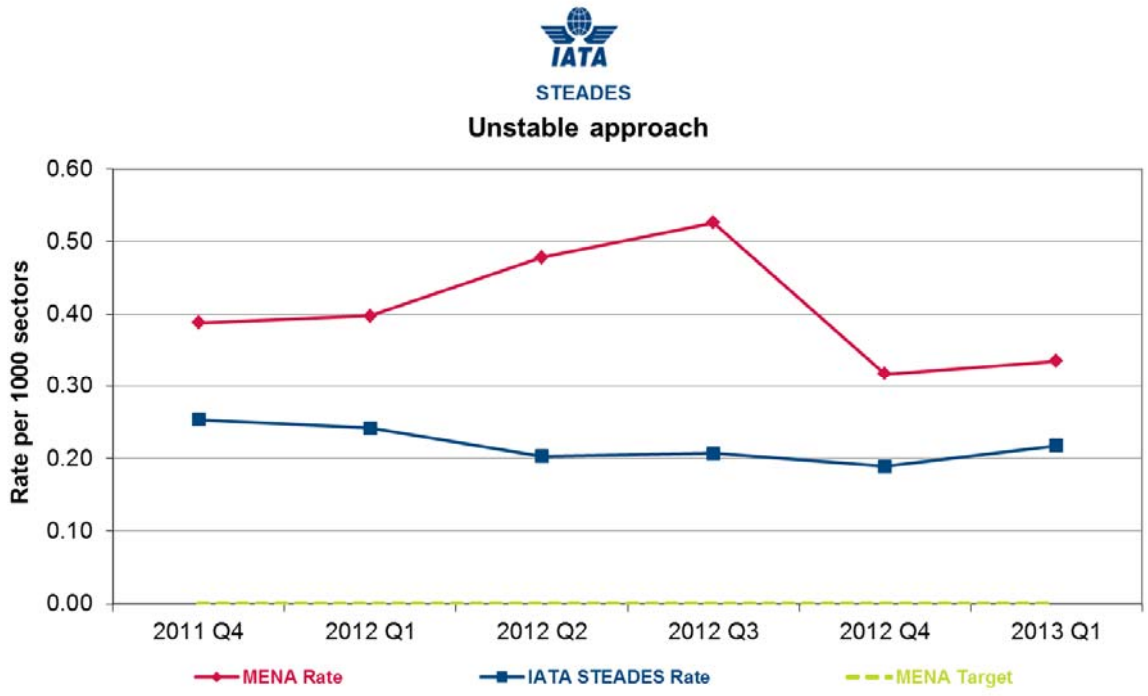
2.2.2.1.12 Stall Warning



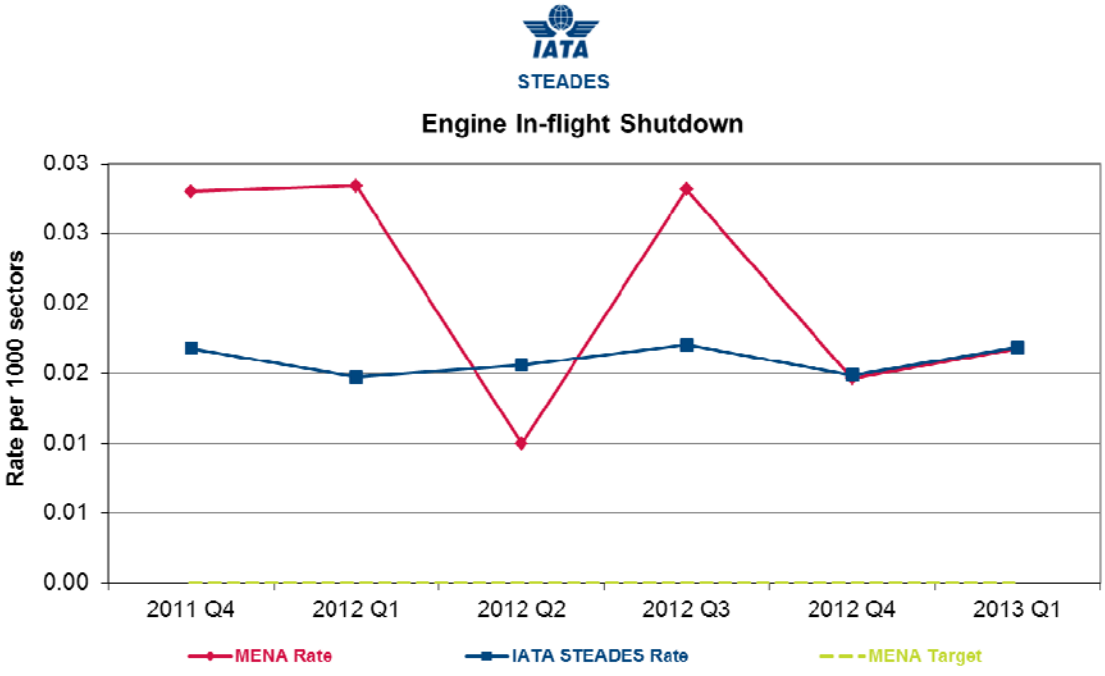
2.2.2.1.13 TCAS RA



2.2.2.1.14 Unstable Approach



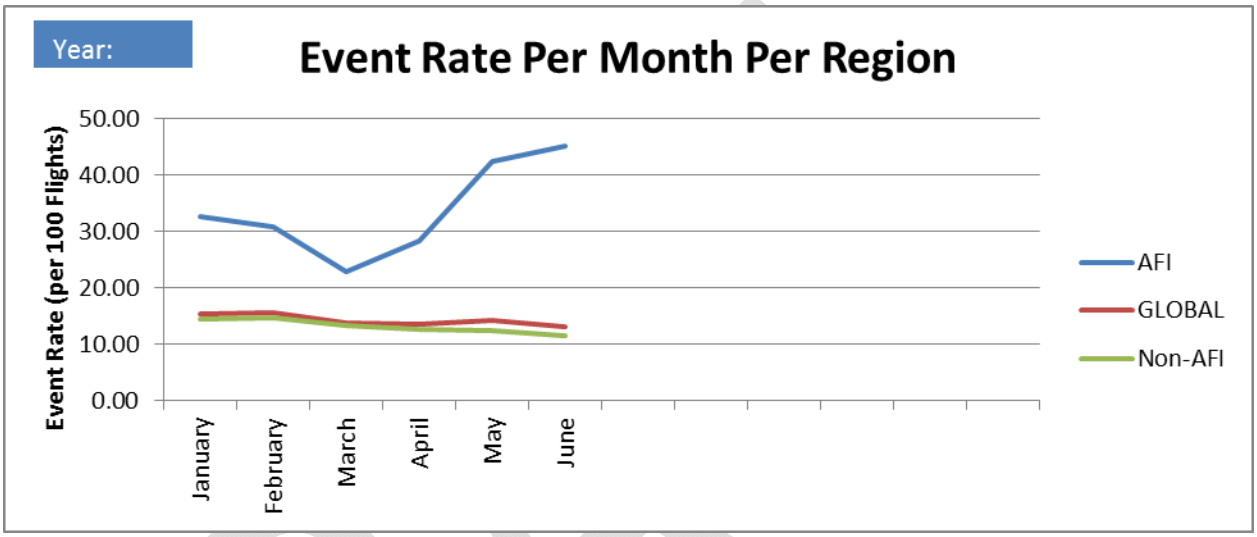
2.2.2.1.15 Engine In-flight Shutdown

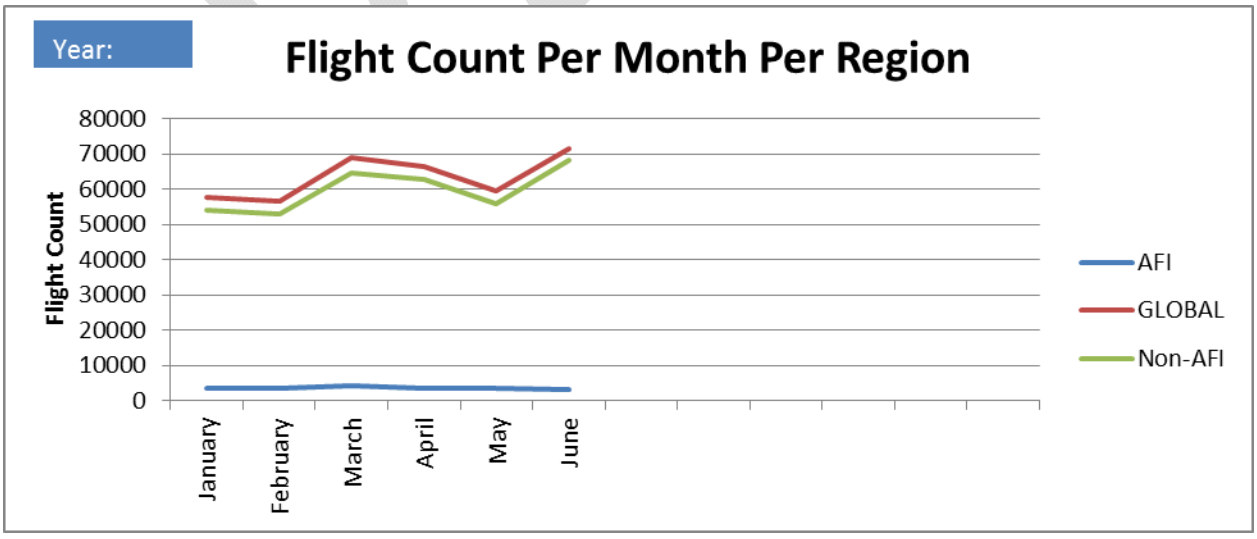


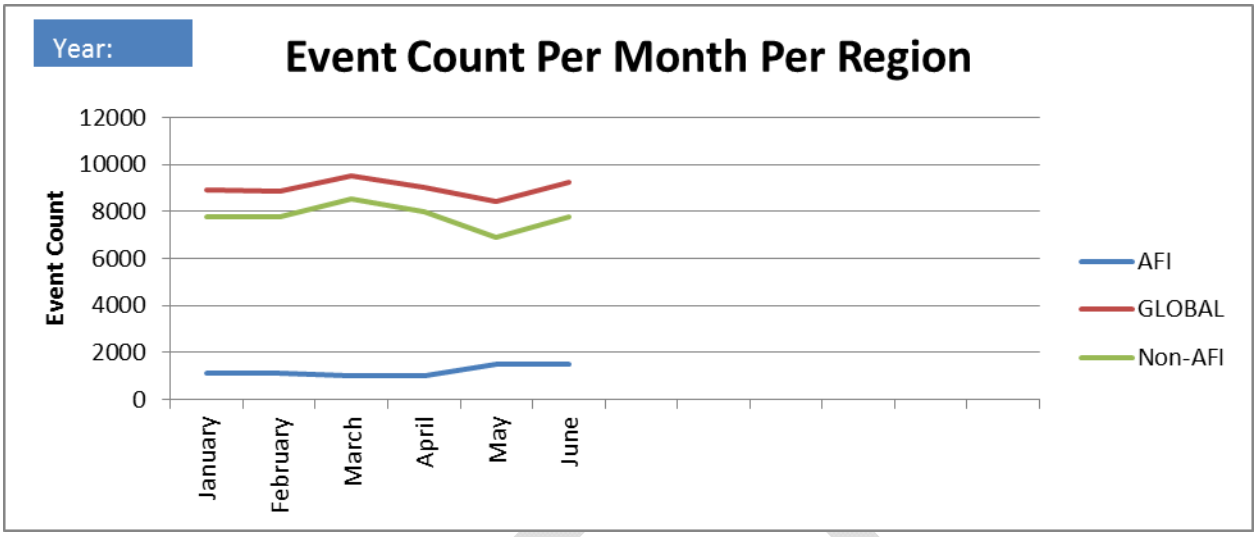
2.2.2.2 FDX data

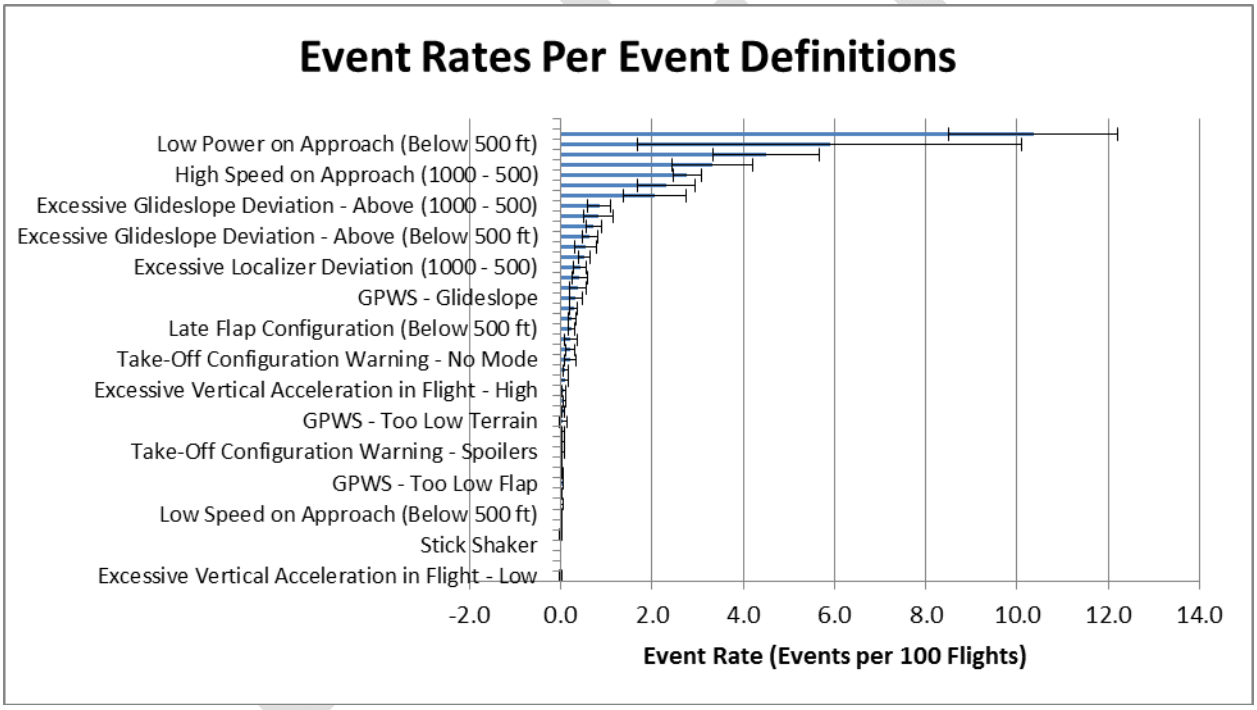
Flight Data eXchange (FDX) is an aggregated de-identified database of FDA/ FOQA type events that allows the user to identify commercial flight safety issues for a wide variety of safety topics, for many types of aircraft, across a global database; as well as allows flight operations and safety departments to proactively identify safety hazards.

Due to low participation of MENA airlines in the FDX database, the following charts are combined for AFI, and MENA. Future editions of the Annual Safety Report will include more indicative charts of the Middle East.





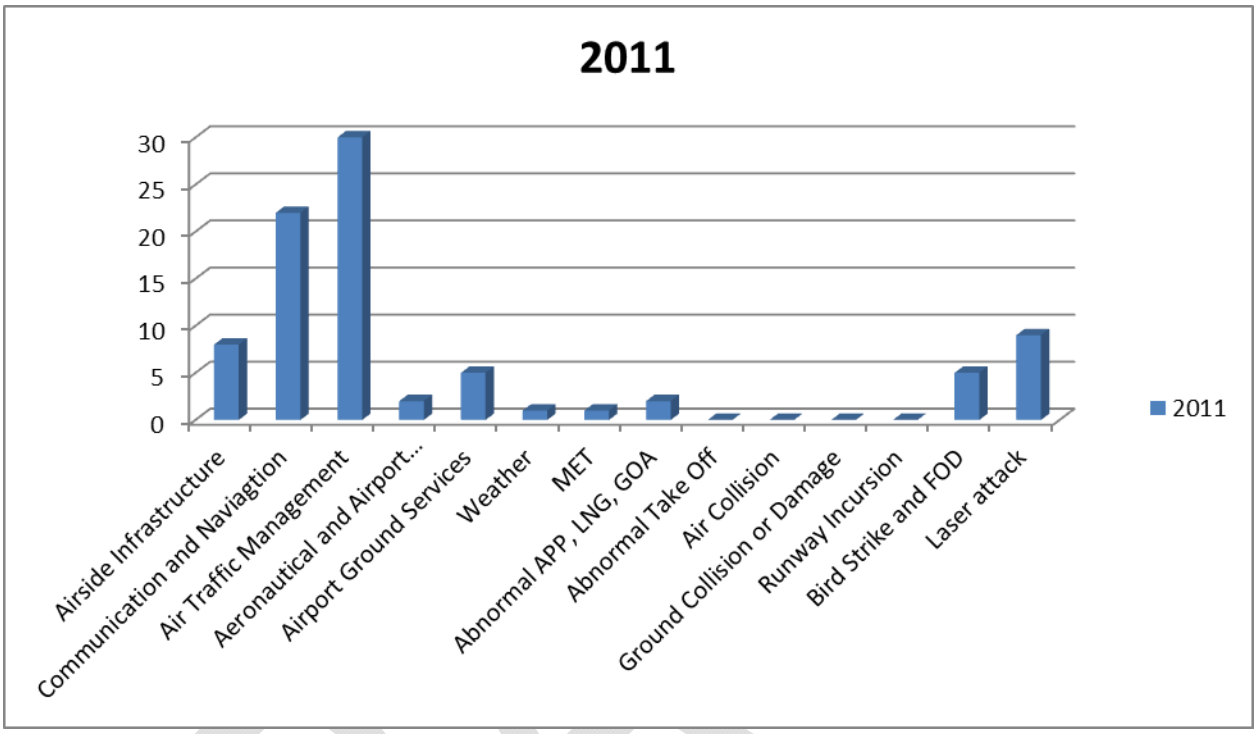

Year:
Event Count Per Month Per Region
12000
10000
8000
6000
4000
2000
0
Event Count
January
February
March
April
May
June
AFI
GLOBAL
Non-AFI

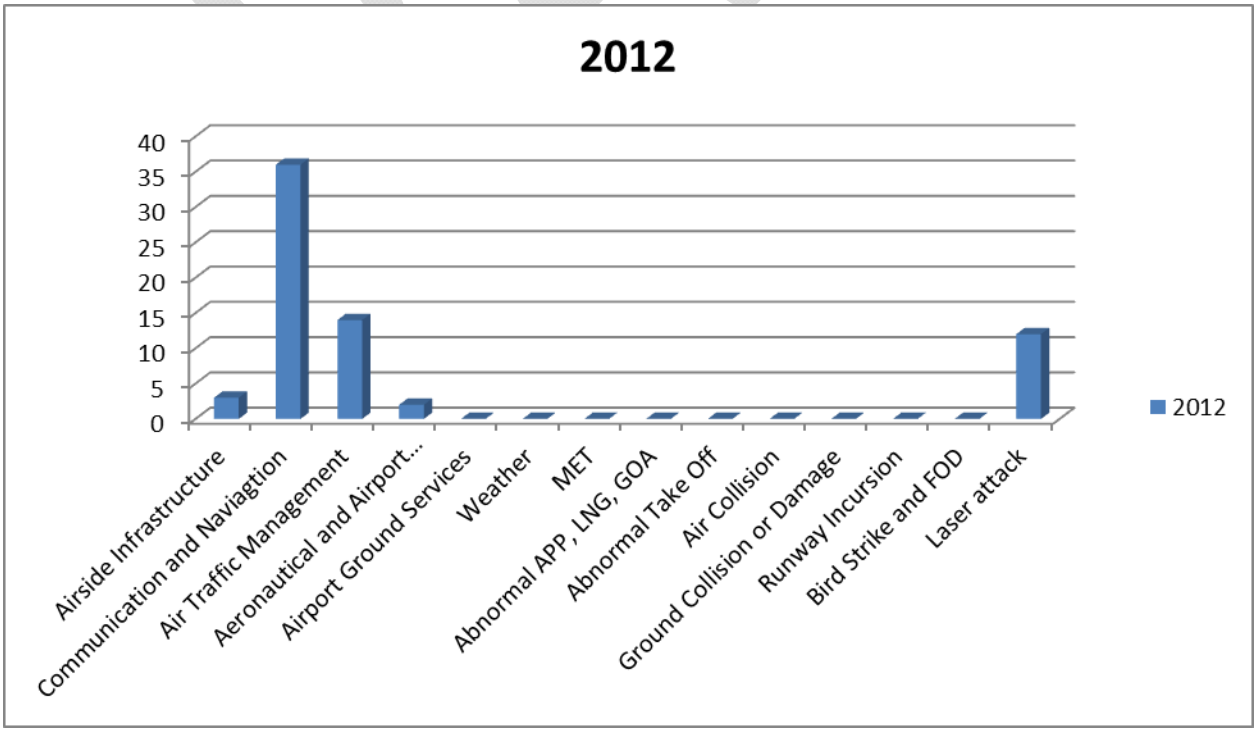

Event Rates Per Event Definitions
Low Power on Approach (Below 500 ft)
High Speed on Approach (1000 - 500)
Excessive Glideslope Deviation - Above (1000 - 500)
Excessive Glideslope Deviation - Above (Below 500 ft)
Excessive Localizer Deviation (1000 - 500)
GPWS - Glideslope
Late Flap Configuration (Below 500 ft)
Take-Off Configuration Warning - No Mode
Excessive Vertical Acceleration in Flight - High
GPWS - Too Low Terrain
Take-Off Configuration Warning - Spoilers
GPWS - Too Low Flap
Low Speed on Approach (Below 500 ft)
Stick Shaker
Excessive Vertical Acceleration in Flight - Low
-2.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Event Rate (Events per 100 Flights)

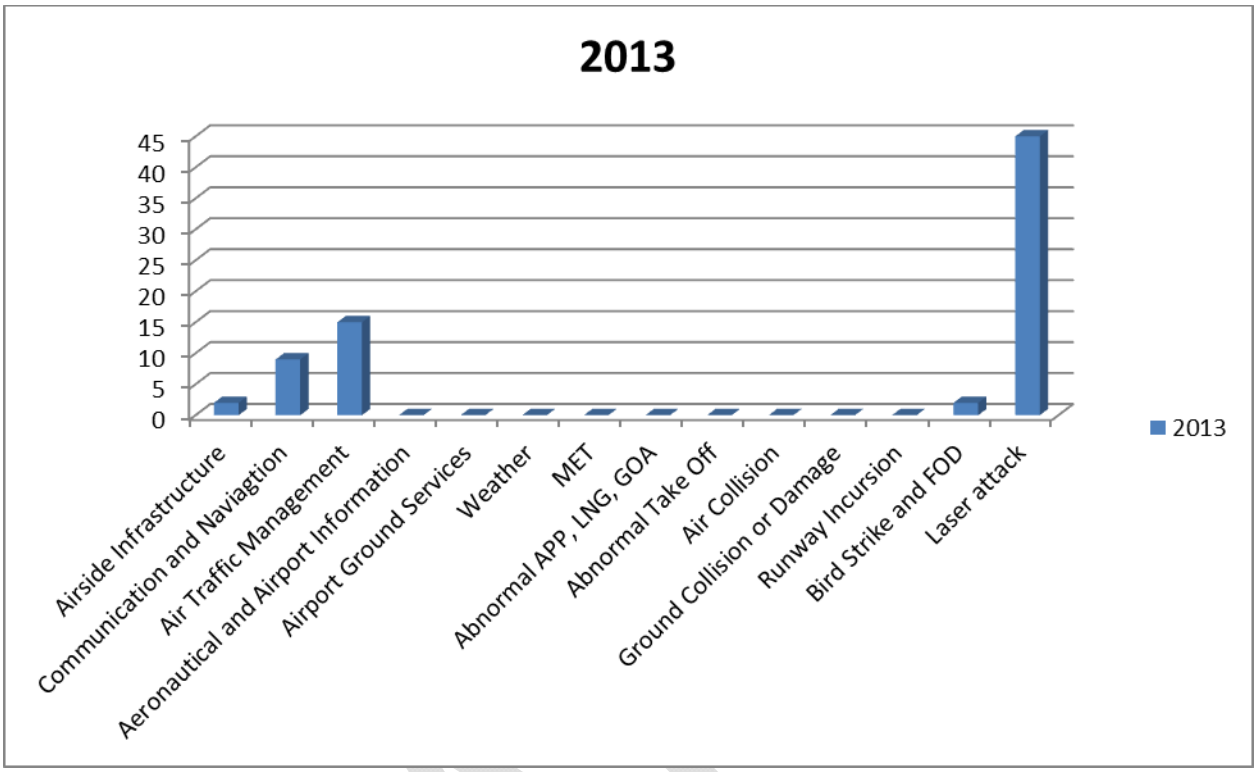
2.2.2.3 Incidents and Occurrences Reported by States

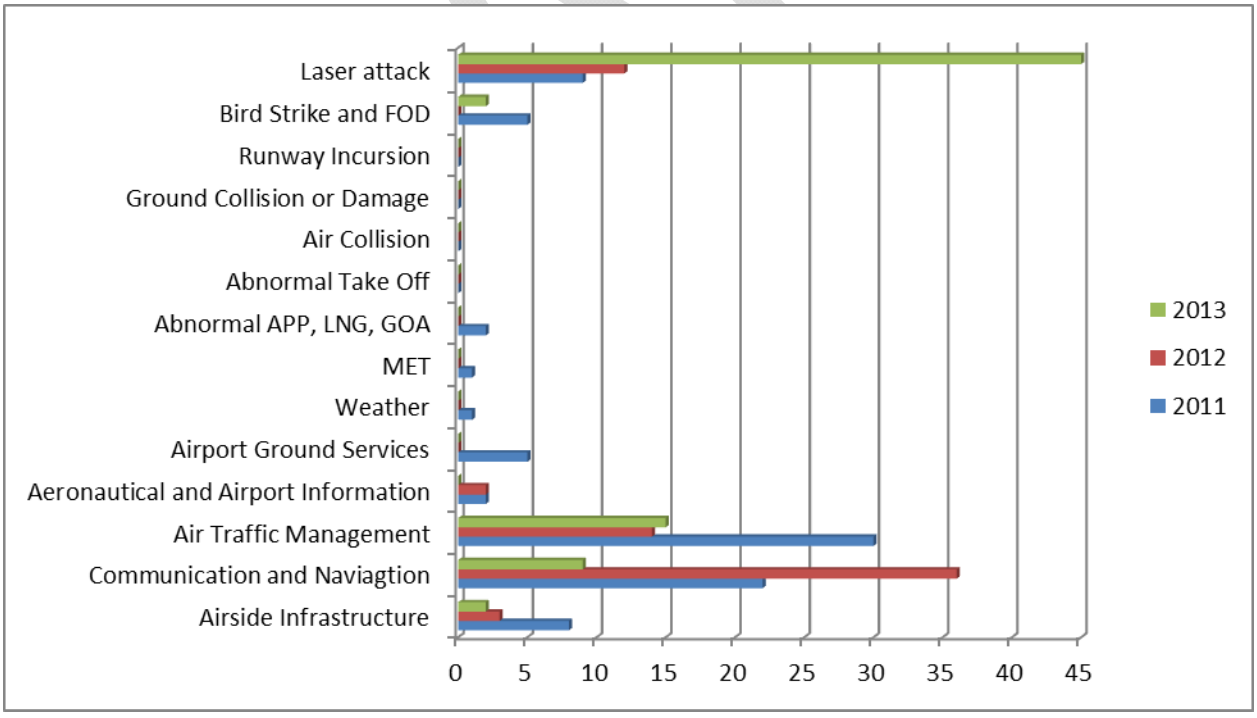
2.2.2.4 Incidents and occurrences reported by airlines

The following analysis and charts takes into consideration reported incidents and occurrences by airlines to the IATA MENA Office for the period January 2011 till July 2013.






2013
45
40
35
30
25
20
15
10
5
0
Airside Infrastructure
Communication and Naviagtion
Air Traffic Management
Aeronautical and Airport Information
Airport Ground Services
Weather
MET
Abnormal APP, LNG, GOA
Abnormal Take Off
Air Collision
Ground Collision or Damage
Runway Incursion
Bird Strike and FOD
Laser attack
2013


Laser attack
Bird Strike and FOD
Runway Incursion
Ground Collision or Damage
Air Collision
Abnormal Take Off
Abnormal APP, LNG, GOA
MET
Weather
Airport Ground Services
Aeronautical and Airport Information
Air Traffic Management
Communication and Naviagtion
Airside Infrastructure
0
5
10
15
20
25
30
35
40
45
2013
2012
2011

The major incidents categories for the MID region based on reports received directly from airlines are;

1. Laser Attacks
2. Communication and Navigation
3. Air Traffic Management
4. Airside Infrastructure

The following analysis takes a more in-depth look at the four identified areas.

1. Laser Attacks

2. Communication and Navigation
3. Air Traffic Management
4. Airside Infrastructure

2.2.2.5 Main Risk Areas and Hazards

2.2.3 On demand analysis of identified risks or hazards

2.2.3.1 Call-sign Confusion

The use of similar call signs by aircraft operating in the same area often gives rise to potential and actual flight safety incidents. Reports have been raised by airline operators and Air Navigation Service Providers of common incidents related to call-sign conflict in the Middle East.

Call sign confusion can be either aural or visual, or both. Aural confusion can occur between flight crews and controller – and sometimes between different flight crews. Visual confusion is primarily an ATC problem. It relates to flight progress strips (FPS) and radar displays, where call signs are the primary means of identifying the aircraft.

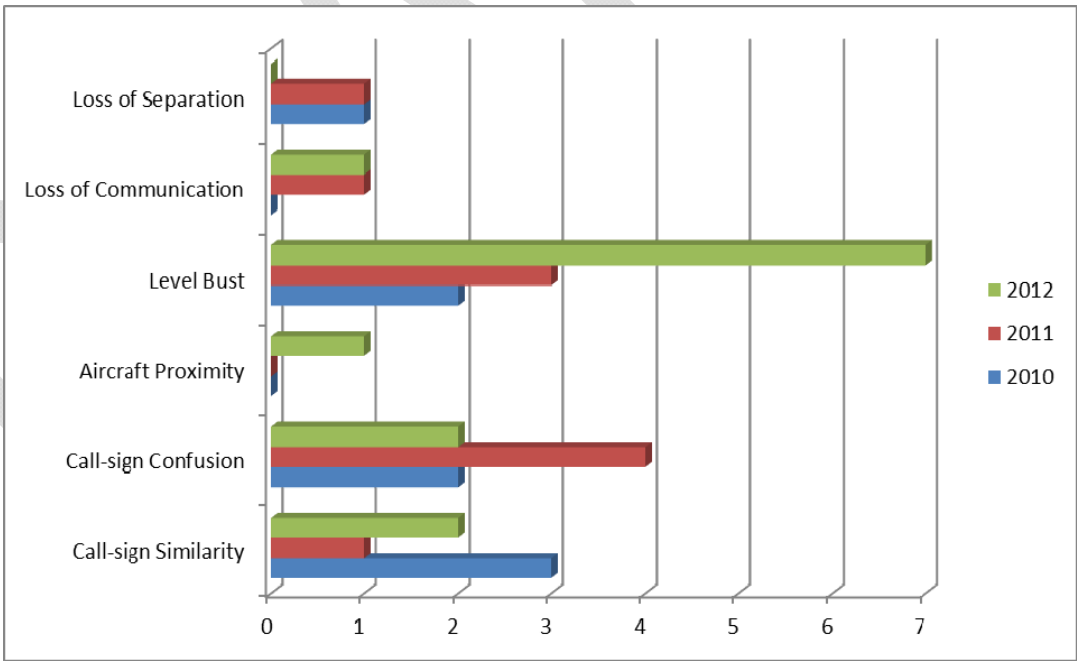
Pursuant to the RASG-MID/2 Meeting, a study was launched to to collect reliable data over a specified period of time, to ascertain the magnitude of the problem, and confirm the categories of contributing factors causing call-sign confusion in the MID Region.

The call-sign confusion survey was distributed to all 29 IATA members and all 15 States in the MID Region. Responses from 9 airlines were received. Four airlines reported that they have no incidents to report, and one reported no occurrences in the MID region.

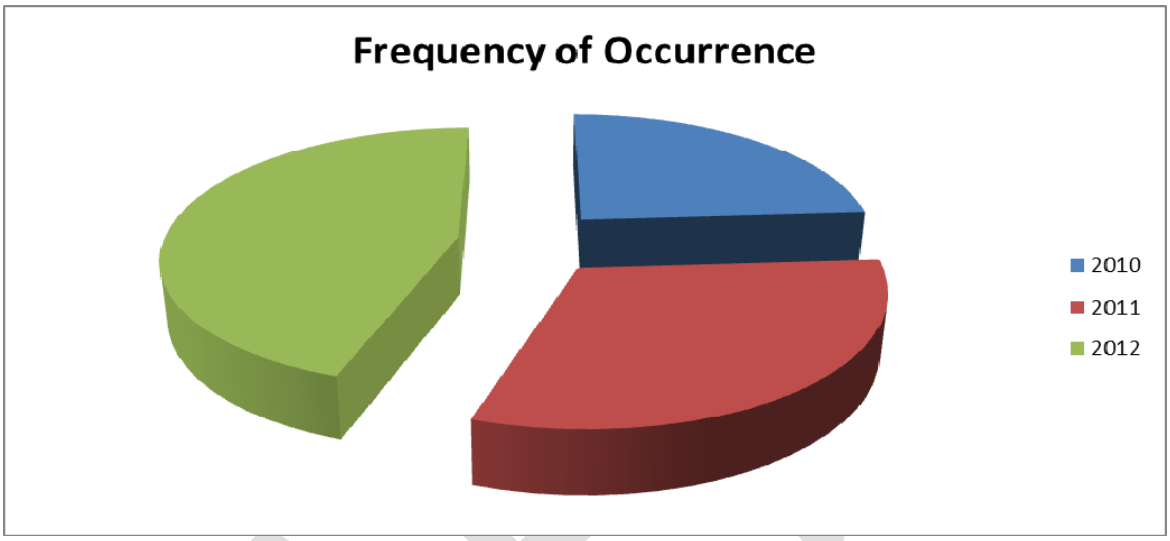
The following charts illustrate the collected responses.

1. Airline Responses

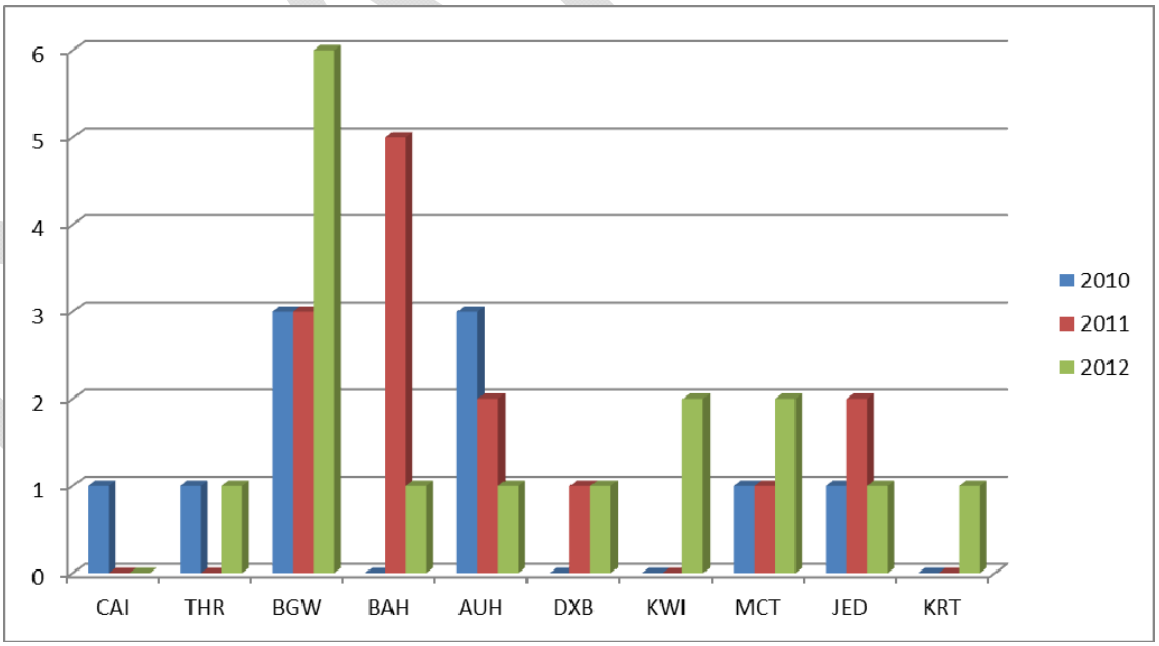
   - Nature of Occurrence



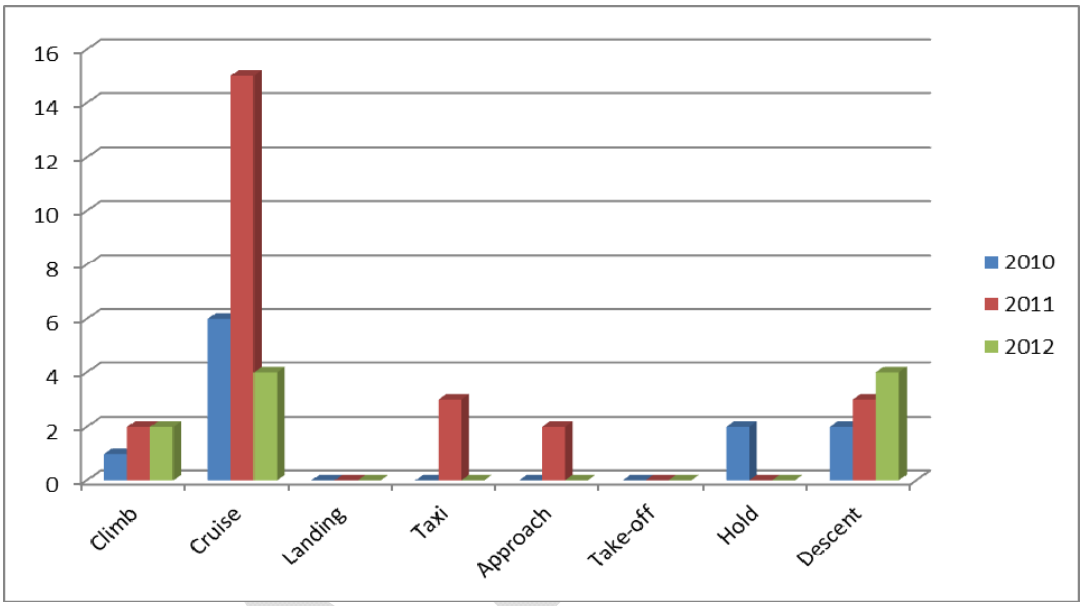
- Frequency of Occurrence



- Location of Occurrence



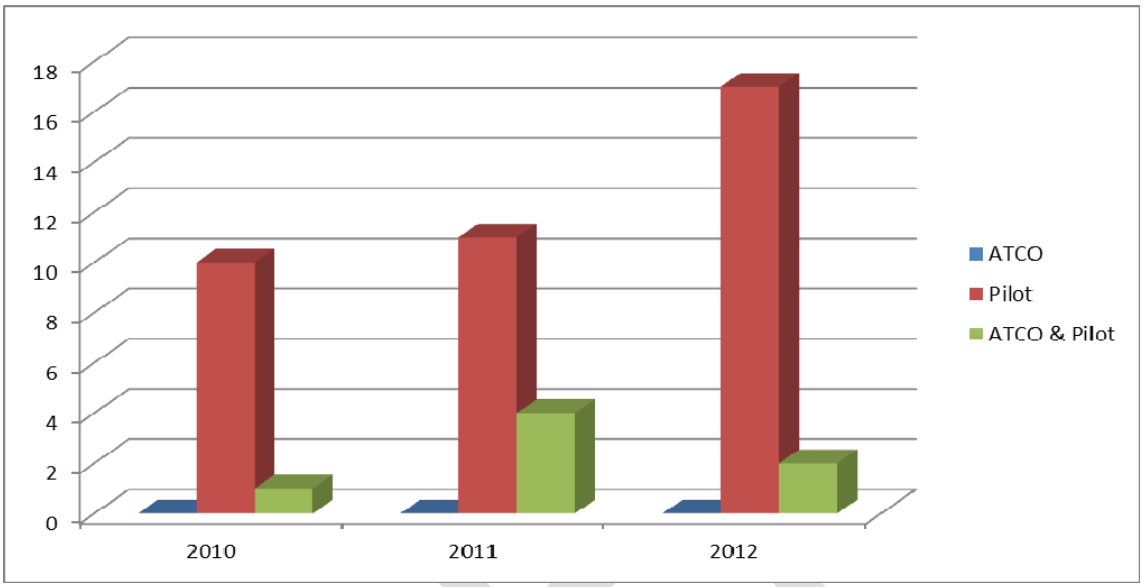
- Flight Phase



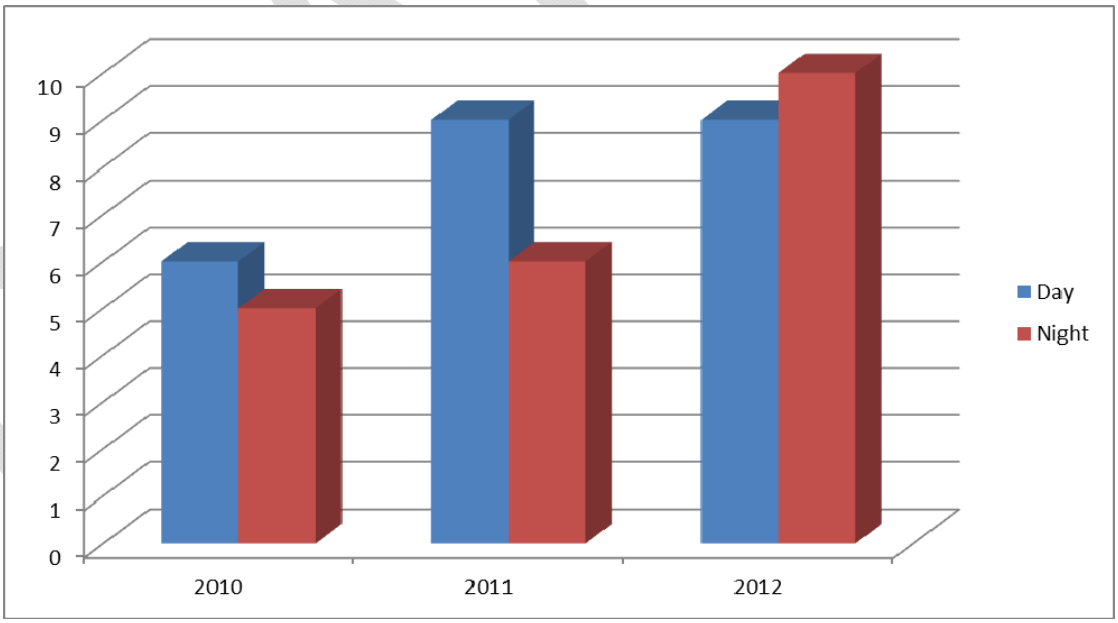
- Severity

A	prescribed ATC separation was lost
B	there was no loss of prescribed ATC separation but there was some deviation from operating procedures by the flight crew(s) or controller
C	there was no deviation from operating procedures

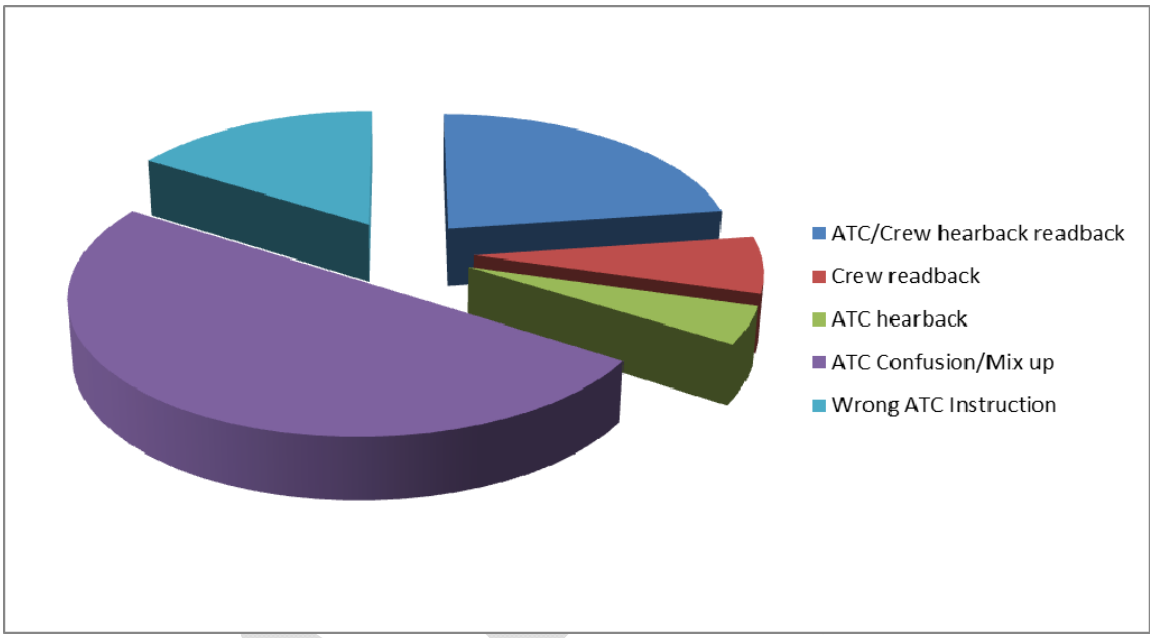
- Reported by



- Time of Day



- Main root Cause



2.3 Predictive Safety Information

Until the end of 2012, the Middle East Region did not fully develop mechanisms for gathering and processing predictive safety information. However, initiatives have been undertaken to advance capabilities to produce predictive safety information within 2014. A Safety Management Workshop was held in Oman on 11-12 June 2013. The purpose of the Safety Management Workshop was to promote the RASG-MID and in particular its Safety Support Team (SST) activities related to safety management and stimulate a dynamic exchange of knowledge and experience on the development and effective implementation of SSP/SMS with an emphasis on the need to improve the reporting and sharing of safety data at national and regional level. The discussions under the "Safety Data Sharing" session resulted in the following conclusions;

- A High-level briefing on safety management will be provided to the Top management (DGs and CEOs) concurrently with the next MID Safety Summit in 2014;
- States and airlines are encouraged to use existing tools to enhance safety data reporting (IATA and ICAO Tools);
- Enhance safety culture to promote reporting, through;
    - Management commitment and leadership
    - Non-punitive approach (Safety Culture)
    - Safety Promotion (training and communication)
    - Motivation: Incentives and rewards
    - Ownership
    - Transparency
    - Feedback after reporting (action taken)
- Adopting a collaborative approach and pooling of resources (RSOOs, forums, event) for sharing of expertise and best practices;
- Importance of the role of the regulator in achieving effective safety reporting culture.

Under this section of the report, the aim is to collect and analyse safety data to proactively identify safety concerns before accidents or incidents occur, to develop timely mitigation and prevention measures.

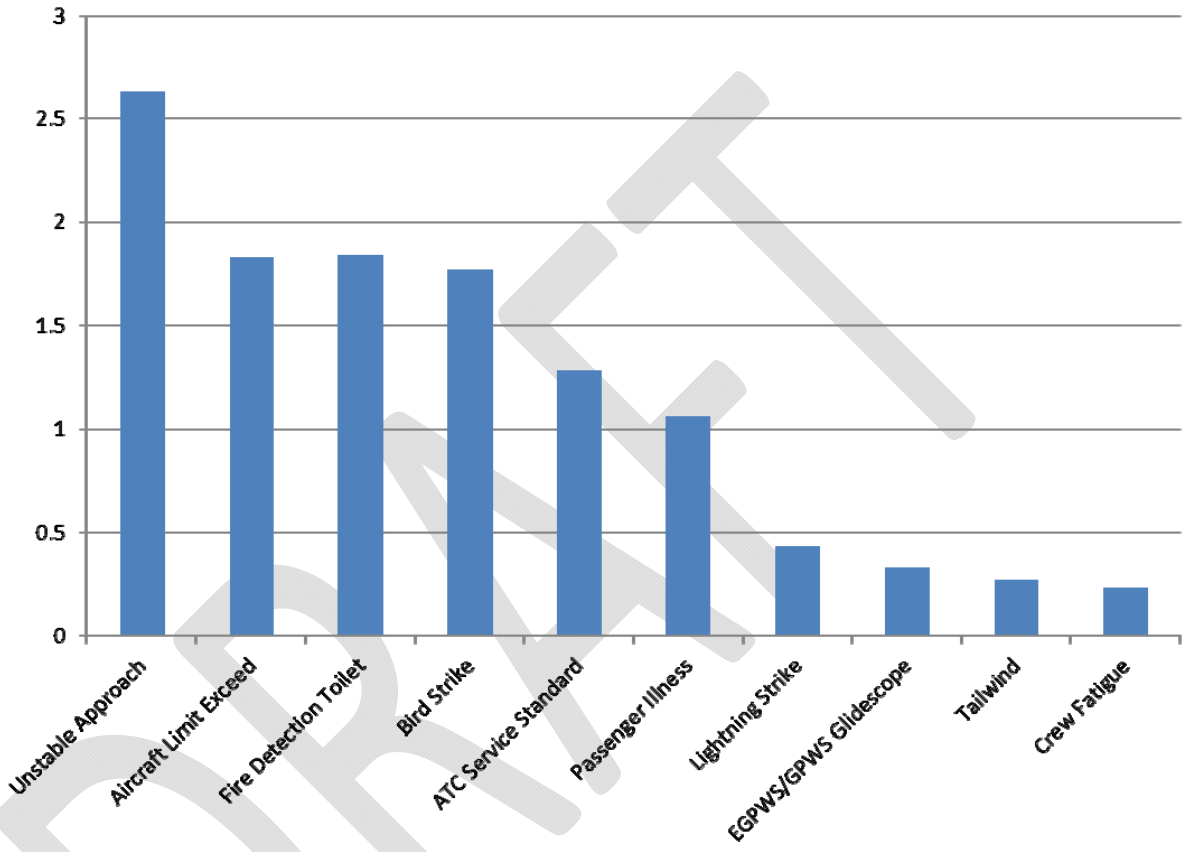
2.3.1 FDM Trends and FOQA Data

2.3.1.1 IATA Flight Data Exchange (FDX) Tool

2.3.1.2 Regional Analysis under TLST

The Top Level Safety Team (TLST) conducted an analysis using airline's data and input to identify key risk areas.

The top ten incidents per 100 flights are shown in the following chart;



A risk assessment was conducted for the top ten events to establish the priority, and in the following is the risk rating;

Event	Risk Rating
Unstable Approach	9
Aircraft limit exceedance	6
Fire detection toilet	6
Bird Strike	6
ATC Service Standard	9
Fire detection toilet	6
Passenger illness	6
Lightning strike	4
EGPWS/GPWS	6
Crew Transient Fatigue	9

Several risk mitigation measures were proposed under the TLST:

- Unstable Approaches

Event	Design Mitigation	Regulatory Mitigation	Training Mitigation	Education Mitigation
Unstable Approach	Feasible using current technology. Fly the green with respect to vertical speed and airspeed?	Introduce stabilization criteria, in law?	Enhanced SOP. (airline driven) Dedicated simulator training session (airline driven).	FSF ALAR

- Fatigue

Event	Design Mitigation	Regulatory Mitigation	Training Mitigation	Education Mitigation
Fatigue	Technically possible but effectiveness undetermined. Not workable	Minor amendment only required to existing CAAP.	Not an option	Effective but less so than regulation

- ATC Service Standard

Event	Design Mitigation	Regulatory Mitigation	Training Mitigation	Education Mitigation
ATC Service Standard	Possible, but an accelerated program not viable. Long implementation time.	Workable, with cost burden to industry.	Testing easily achieved. Retraining (if required) could take some time. Workable	Workable with relatively low cost burden and moderate implementation time.

- EGPWS/ Glide slope

Event	Design Mitigation	Regulatory Mitigation	Training Mitigation	Education Mitigation
EGPWS/ GPWS	Workable and cost effective.	Workable but at a time cost.	Workable with cost burden to operator	Workable and effective

RASG-MID will make use of the work of the TLST to further support the development of SEIs/DIPs.

2.3.2 Hazard Identification and Risk Assessment

2.3.2.1 Safety Management Systems (SMS)
2.3.2.2 State Safety Program (SSP)

ICAO requires each State to adopt a proactive approach for improving safety. The proactive approach in the safety management is based on following a risk management strategy that includes identifying hazards before they result into incidents or accidents.

SSP is defined as a systematic approach to managing safety risks. It is a management system for the regulation and administration of safety by the State. It includes integrated set of regulations and activities aimed at improving safety. SSP requires specific functions to be performed by States, including the enactment of legislation, regulations, policies and directives to support the safe and efficient delivery of aviation products and services under its authority.

The objectives of the SSP are to:

- Support senior level strategic decision making
- Support safety decision making by the state
- Establish an ALoSP in civil aviation
- Close the gap that could potentially exist between the internal and external safety processes of the State and the internal safety processes (Safety Management System-SMS) of the service providers
- Re-enforce the performance based approach in addition to the prescriptive approach when assessing service providers levels of safety
- Establish a fair enforcement standard that does not deter organizations and/or persons from disclosing confidential safety related information
- Establish a means to capture and analyze data on reported HAZARDS in addition to safety risks at both an individual and aggregate level within the State
- Allow for prioritization of surveys, audits and inspections on identified areas of greater safety concern.

This section of the report will provide insight into the implementation of SSP by States in the MID Region and safety data collected within each SSP.

- <u>SSP Program Implementation in the UAE</u>

  GCAA established a framework to support its development under a project with defined outcomes in order to achieve acceptable level of safety performance (ALoSP) by 2014 end.

  The UAE Aviation sector is undergoing a comprehensive change towards the implementation of an efficient Safety Management System (SMS). Effort for this change began a few years ago and is now gaining momentum, steadily progressing towards its final stages.

  SMS integrates current GCAA safety-related regulations, operational policies, processes, and procedures, as well as introduces new elements necessary for a systematic approach to managing the safety risks by the service providers. Since the level of maturity of the SMS varies between different service providers based on factors like the complexity of the organization, availability of expertise, and the resource level, giving a timeframe at this point is challenging.

In order to ensure implementation and effectiveness of SMS, GCAA has developed a robust SMS assessment program which is supported by CARs and Guidance materials. In 2011, GCAA developed a check list and procedures for the various functional areas, to support SMS audit activities. Till date, nearly 90% of the operators and organizations have been audited by GCAA.

In addition to maintaining the program of SSP, GCAA recognizes the importance of SMS effectiveness. Accordingly, GCAA has undertaken an initiative to arrange specialized training for Inspectors on “How to make SMS effective.” The purpose of this training is to indoctrinate them on theoretical aspects and sharing experiences on success and challenges to SMS.

As part of harmonization GCAA is sharing knowledge on SMS with international safety partners.

SMS is changing the relationship between the regulator and the industry. GCAA is fully engaged with service providers towards a closer dialogue and cooperative relationship. However, the role of GCAA in terms of safety oversight and compliance assurance is still paramount.

Safety Performance Measurement (SPM) development started in June 2012. In keeping with ICAO requirements, GCAA developed its own model for SPM which includes Safety Performance Indicators (SPI), Safety Performance Objectives (SPO) and Safety Performance Targets (SPT). These are linked with Action Plans and Alert Levels to ensure proper implementation and tracking of improvement measures. To this effect, GCAA is continuously holding special workshops to educate the industry. GCAA plans to incorporate SPM across the industry by 2014 end, so that UAE is able to establish Acceptable Level of Safety Performance (ALoSP).

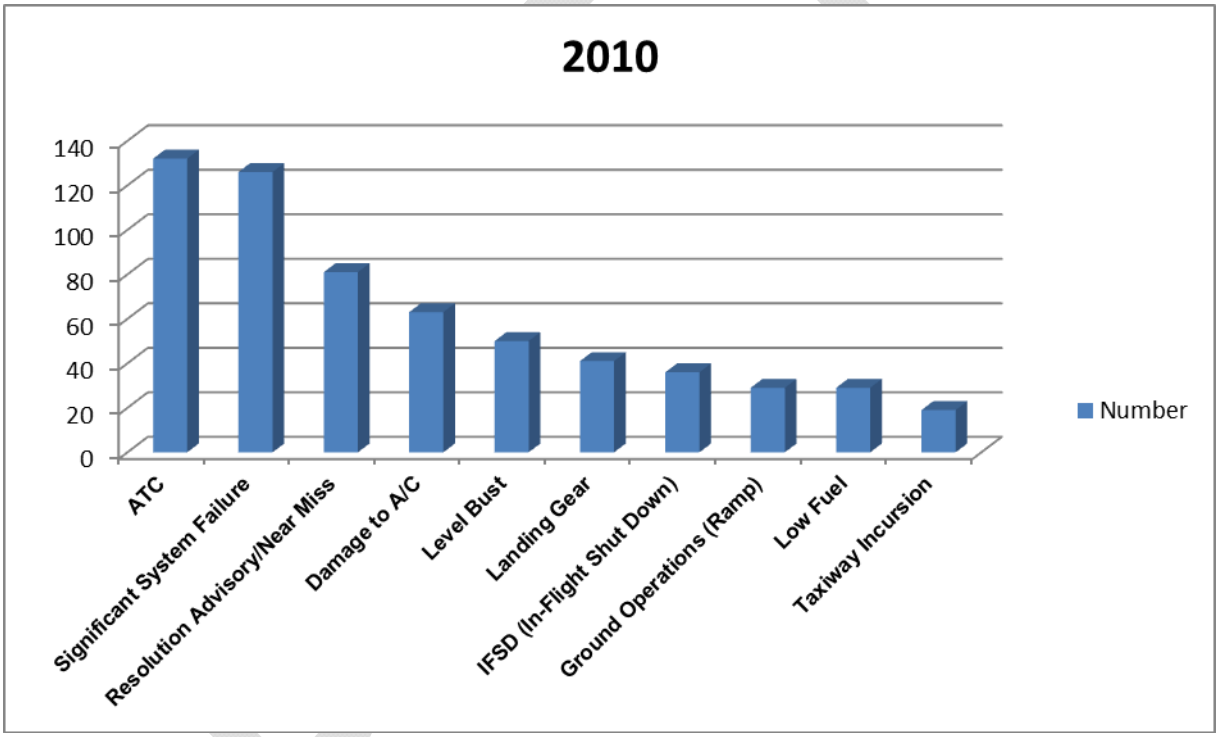
- Safety Data Collection under the SSP:

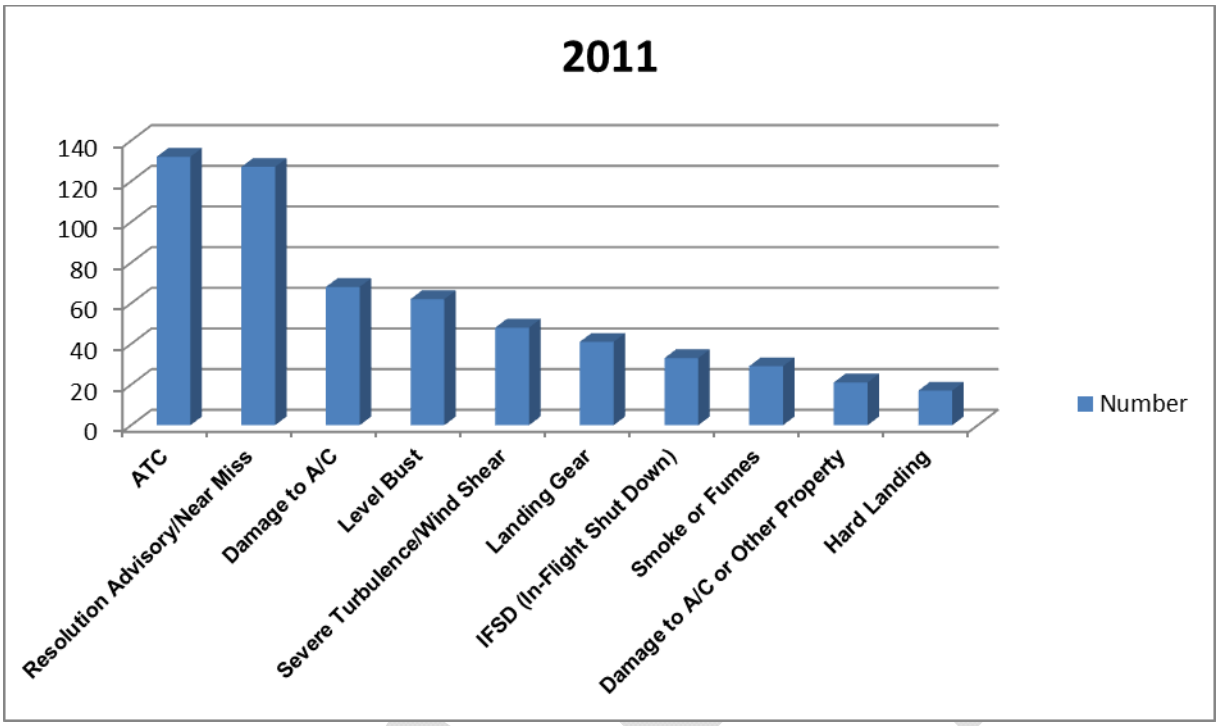
  As per the Project Plan, an important segment of SSP which calls for effective safety data collection was achieved through the introduction of Reporting of Safety Incidents (ROSI) in 2010. Over the last three years, the data collected are being used for risk assessment, identifying the following two major areas of risk:

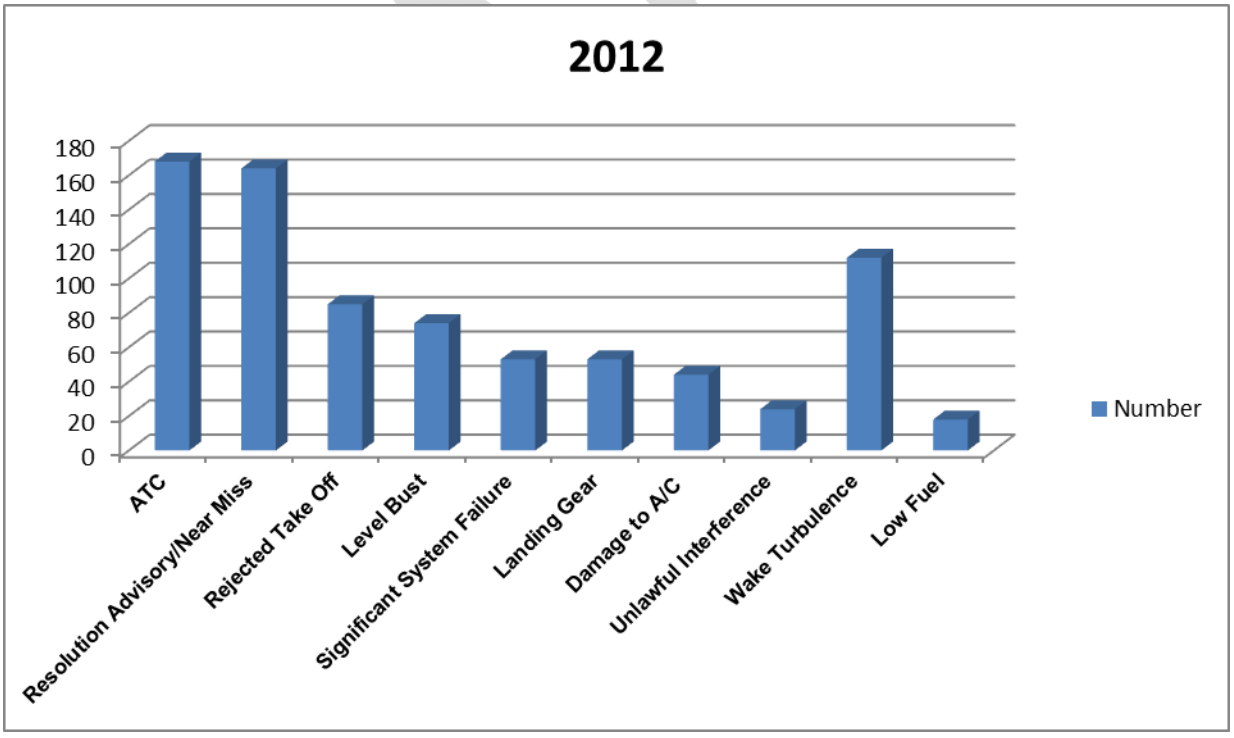
  - Airprox (Loss of Separation), Level Bust
  - Turbulence related injuries

  The conclusion of the risk assessment indicated that there was a remote probability of above events; however, the contributing factors do possess a greater risk of probability and severity. Subject to implementation of appropriate mitigation processes, the occurrence of such incidents and their hazardous consequences can be mitigated to the "tolerable region."

  The most frequent incidents (Top 10) in the UAE during the last 3 years are shown in the following charts:







The upcoming editions of the Annual Safety Report will include more in-depth analysis of safety collected from SSP/SMS programs and will provide predictive trends analysis to develop risk management strategies that includes identifying hazards before they result into incidents or accidents.

3. Final Conclusions

List of Acronyms

ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
ATS	Air Traffic Services
ASRT	Annual Safety Report Team
CFIT	Controlled flight into terrain
FDA	Flight Data Analysis
FOQA	Flight Operations Quality Assurance
GASP	ICAO Global Aviation Safety Plan
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
LOC-I	Loss of control - inflight
MID	Middle East region (ICAO region)
MENA	Middle East & North Africa (IATA region)
RE	Runway excursion(departure or landing)
RI	Runway Incursion
SMS	Safety Management System
SOP	Standard Operating Procedure
SSP	State Safety Programme
UAS	Undesirable Aircraft State
USOAP	Universal Safety Oversight Audit Programme

Appendix A - Definitions

Accident: an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, in which:

- a person is fatally injured as a result of:

a) being in the aircraft;
b) direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or
c) direct exposure to jet blast except when the injuries are from natural causes, selfinflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew;

- the aircraft sustains damage or structural failure which:

a) adversely affects the structural strength, performance or flight characteristics of the aircraft; and
b) would normally require major repair or replacement of the affected component except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to propellers, wing tips, antennae, tires, brakes, fairings, small dents or puncture holes in the aircraft skin; or the aircraft is still missing or is completely inaccessible.

Notes

1. *For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified as a fatal injury by ICAO.*
2. *An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located. For purposes of this Safety Report, only operational accidents are classified.*

The following types of operations are excluded:

- *Private aviation*
- *Business aviation*
- *Illegal flights (e.g., cargo flights without an airway bill, fire arms or narcotics trafficking)*
- *Humanitarian relief*
- *Crop dusting/agricultural flights*
- *Security-related events (e.g., hijackings)*
- *Experimental/Test flight*

Accident classification: the process by which actions, omissions, events, conditions, or a combination thereof, which led to the accident are identified and categorized.

Aerodrome manager: as defined in applicable regulations and includes the owner of aerodrome.

Aircraft: the involved aircraft, used interchangeably with aeroplane(s).

Cabin Safety-related Event: accident involving cabin operations issues, such as a passenger evacuation, an onboard fire, a decompression or a ditching, which requires actions by the operating cabin crew.

Eastern-built Jet aircraft: commercial Jet transport aircraft designed in CIS countries or the People's Republic of China.

Eastern-built Turboprop aircraft: commercial Turboprop transport aircraft designed in CIS countries or the People's Republic of China.

Fatal accident: an accident where at least one passenger or crewmember is killed or later dies of their injuries as a result of an operational accident.

Events such as slips and falls, food poisoning, turbulence or accidents involving on board equipment, which may involve fatalities but where the aircraft sustains minor or no damage, are excluded.

Fatality: a passenger or crewmember who is killed or later dies of their injuries resulting from an operational accident. Injured persons who die more than 30 days after the accident are excluded.

Hazard: condition, object or activity with the potential of causing injuries to personnel, damage to equipment or structures, loss of material, or reduction of ability to perform a prescribed function.

Hull loss: an accident in which the aircraft is destroyed or substantially damaged and is not subsequently repaired for whatever reason including a financial decision of the owner.

Incident: an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Major repair: a repair which, if improperly done, might appreciably affect mass, balance, structural strength, performance, powerplant operation, flight characteristics, or other qualities affecting airworthiness.

Occurrence: any unusual or abnormal event involving an aircraft, including but not limited to an incident.

Operational accident: an accident which is believed to represent the risks of normal commercial operation, generally accidents which occur during normal revenue operations or positioning flights.

Operator: a person, organization or enterprise engaged in or offering to engage in aircraft operation.

Phase of flight: the phase of flight definitions applied by IATA were developed by the Air Transport Association (ATA). They are presented in the following table.

Flight Planning (FLP) This phase begins when the flight crew initiates the use of flight planning information facilities and becomes dedicated to a flight based upon a route and an airplane; it ends when the crew arrives at the aircraft for the purpose of the planned flight or the crew initiates a "Flight Close" phase.	**Initial Climb (ICL)** This phase begins at 35 ft above the runway elevation; it ends after the speed and configuration are established at a defined maneuvering altitude or to continue the climb for the purpose of cruise. It may also end by the crew initiating an "Approach" phase. Note: Maneuvering altitude is based upon such an altitude to safely maneuver the aircraft after an engine failure occurs, or pre-defined as an obstacle clearance altitude. Initial Climb includes such procedures applied to meet the requirements of noise abatement climb, or best angle/rate of climb.
Pre-flight (PRF) This phase begins with the arrival of the flight crew at an aircraft for the purpose of flight; it ends when a dedication is made to depart the parking position and/or start the engine(s). It may also end by the crew initiating a "Post-flight" phase. Note: The Pre-flight phase assumes the aircraft is sitting at the point at which the aircraft will be loaded or boarded, with the primary engine(s) not operating. If boarding occurs in this phase, it is done without any engines operating. Boarding with any engine operating is covered under Engine Start/Depart.	**En Route Climb (ECL)** This phase begins when the crew establishes the aircraft at a defined speed and configuration enabling the aircraft to increase altitude for the purpose of cruising; it ends with the aircraft established at a predetermined constant initial cruise altitude at a defined speed or by the crew initiating a "Descent" phase.
Engine Start/Depart (ESD) This phase begins when the flight crew take action to have the aircraft moved from the parked position and/or take switch action to energize the engine(s); it ends when the aircraft begins to move forward under its own power or the crew initiates an "Arrival/Engine Shutdown" phase. Note: The Engine Start/Depart phase includes: the aircraft engine(s) start-up whether assisted or not and whether the aircraft is stationary with more than one engine shutdown prior to Taxi-out, i.e., boarding of persons or baggage with engines running. It includes all actions of power back for the purpose of positioning the aircraft for Taxi-out.	**Cruise (CRZ)** The cruise phase begins when the crew establishes the aircraft at a defined speed and predetermined constant initial cruise altitude and proceeds in the direction of a destination; it ends with the beginning of Descent for the purpose of an approach or by the crew initiating an "En Route Climb" phase.

Taxi-out (TXO) This phase begins when the crew moves the aircraft forward under its own power; it ends when thrust is increased for the purpose of Take-off or the crew initiates a "Taxi-in" phase. Note: This phase includes taxi from the point of moving under its own power, up to and including entering the runway and reaching the Take-off position.	**Descent (DST)** This phase begins when the crew departs the cruise altitude for the purpose of an approach at a particular destination; it ends when the crew initiates changes in aircraft configuration and/or speeds to facilitate a landing on a particular runway. It may also end by the crew initiating an "En Route Climb" or "Cruise" phase.
Take-off (TOF) This phase begins when the crew increases the thrust for the purpose of lift-off; it ends when an Initial Climb is established or the crew initiates a "Rejected Take-off" phase.	**Approach (APR)** This phase begins when the crew initiates changes in aircraft configuration and /or speeds enabling the aircraft to maneuver for the purpose of landing on a particular runway; it ends when the aircraft is in the landing configuration and the crew is dedicated to land on a specific runway. It may also end by the crew initiating an "Initial Climb" or "Go-around" phase.
Rejected Take-off (RTO) This phase begins when the crew reduces thrust for the purpose of stopping the aircraft prior to the end of the Take-off phase; it ends when the aircraft is taxied off the runway for a "Taxiing" phase or when the aircraft is stopped and engines shutdown.	**Go-around (GOA)** This phase begins when the crew aborts the descent to the planned landing runway during the Approach phase, it ends after speed and configuration are established at a defined maneuvering altitude or to continue the climb for the purpose of cruise (same as end of "Initial Climb").
Landing (LND) This phase begins when the aircraft is in the landing configuration and the crew is dedicated to touch down on a specific runway; it ends when the speed permits the aircraft to be maneuvered by means of taxiing for the purpose of arriving at a parking area. It may also end by the crew initiating a "Go-around" phase.	**Post-flight (PSF)** This phase begins when the crew commences the shutdown of ancillary systems of the aircraft for the purpose of leaving the flight deck; it ends when the cockpit and cabin crew leaves the aircraft. It may also end by the crew initiating a "Pre-flight" phase.
Taxi-in (TXI) This phase begins when the crew begins to maneuver the aircraft under its own power to an arrival area for the purpose of parking; it ends when the aircraft ceases moving under its own power with a commitment to shut down the engine(s). It may also end by the crew initiating a "Taxi-out" phase.	**Flight Close (FLC)** This phase begins when the crew initiates a message to the flight-following authorities that the aircraft is secure, and the crew is finished with the duties of the past flight; it ends when the crew has completed these duties or begins to plan for another flight by initiating a "Flight Planning" phase.
Arrival/Engine Shutdown (AES) This phase begins when the crew ceases to move the aircraft under its own power and a commitment is made to shutdown the engine(s); it ends with a dedication to shutting down ancillary systems for the purpose of securing the aircraft. It may also end by the crew initiating an "Engine Start/Depart" phase. Note: The Arrival/Engine Shutdown phase includes actions required during a time when the aircraft is stationary with one or more engines operating while ground servicing may be taking place, i.e., deplaning persons or baggage with engine(s) running, and or refueling with engine(s) running.	**Ground Servicing (GDS)** This phase begins when the aircraft is stopped and available to be safely approached by ground personnel for the purpose of securing the aircraft and performing the duties applicable to the arrival of the aircraft, aircraft maintenance, etc.; it ends with completion of the duties applicable to the departure of the aircraft or when the aircraft is no longer safe to approach for the purpose of ground servicing. (e.g., Prior to crew initiating the "Taxi-out" phase.) Note: This phase was identified by the need for information that may not directly require the input of cockpit or cabin crew. It is acknowledged as an entity to allow placement of the tasks required of personnel assigned to service the aircraft.

Substantial Damage: means damage or structural failure, which adversely affects the structural strength, performance or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component.

Notes:

1. Bent fairing or cowling, dented skin, small punctured holes in the skin or fabric, minor damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wing tips are not considered "substantial damage" for the purpose of this Safety Report.
2. The ICAO Annex 13 definition is unrelated to cost and includes many incidents in which the financial consequences are minimal.

Unstable approach: Approach where the ACTF has knowledge about vertical, lateral or speed deviations in the portion of the flight close to landing.

Note:
This definition includes the portion immediately prior to touchdown and in this respect the definition might differ from other organizations. However, accident analysis gives evidence that a destabilization just prior to touchdown has contributed to accidents in the past.

Western-built Jet: Commercial Jet transport aircraft with a maximum certificated take-off mass of more than 15,000 kg, designed in Western Europe, the Americas or Indonesia.

Western-built Turboprop: Commercial Turboprop transport aircraft with a maximum certificated take-off mass of more than 5,700 kg, designed in Western Europe, the Americas or Indonesia. Single-engine aircraft are excluded.

CREDITS

RASG-MID thanks all those who contributed to the elaboration of this RASG-MID Annual Safety Report and provided necessary support and information to the members of the MID Annual Safety Report Team (MID-ASRT). Special thanks go to:

-END-