International Civil Aviation Organization

Third Meeting of the Middle East Regional Aviation Safety Group (RASG-MID/3)

(Kuwait, 27 - 29 January 2014)

Agenda Item 3: Regional Performance Framework for Safety

REVIEW OF THE SECOND MID REGION ANNUAL SAFETY REPORT

(Presented by ASRT Rapporteur/IATA)

SUMMARY

This paper presents the Second MID Region Annual Safety Report with the analysis of the accidents and incidents data, and identification of the top three key risk areas contributing to accidents in the Middle East.

Action by the meeting is at paragraph 3.

REFERENCES

- RSC/2 Report

1. INTRODUCTION

1.1 The objective of the RASG-MID Annual Safety Report (ASR) 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.

1.2 The Second Edition of the MID Region Annual Safety Report comprises of three main Sections covering Reactive, Proactive and Predictive information. The safety information presented in the report is based on the compilation and analysis of data provided by Boeing, IATA, ICAO, airline operators, and States.

2. DISCUSSION

2.1 The RSC/2 meeting (Amman, Jordan, 28- 30 October 2013) reviewed the Draft Version of the Second MID Region Annual Safety Report and agreed that the ASR should be a high level document (around 30 pages) and detailed information provided thorough analysis of the contributing factors, etc., should be reflected in a supporting document during the presentation of the ASR to the RSC and RASG-MID. In this respect, the meeting agreed that starting from the Second Edition, the ASR would be available to the public on the ICAO MID website.

2.2 The meeting noted that ICAO is in the process of developing a new Annual Safety Report (ASR) Template and accordingly, agreed to take this development into consideration during the review of the MID ASR and the development of the Final Version to be presented to RASG-MID/3 for endorsement.

2.3 The Second MID Region Annual Safety Report is at **Appendix A** to this working paper and the supporting documentation, which includes detailed information providing thorough analysis is at **Appendix B** to this working paper.

2.4 The meeting may wish to note that the RSC/2 meeting agreed that in order to facilitate the identification and prioritization of the main Focus Areas (FAs), the accidents should be categorized in term of frequency and severity. Accordingly, the meeting agreed to a matrix for the prioritization of the MID Region FAs, which is included in the ASR.

2.5 In accordance with the matrix, the meeting agreed that the followings are the three (3) FAs in the MID Region:

a) Runway and Ground Safety
b) Loss of Control In-flight (LOC-I)
c) Controlled Flight Into Terrain (CFIT)

2.6 The meeting may wish to recall that States and airlines have been invited to contribute to the MID-ASRT by providing incidents/occurrences data. In this respect, as a follow-up action to the RASG-MID/2 Conclusion 2/1, the ICAO MID Regional Office urged States to provide their data related to incidents and safety occurrences. It was underlined that all data and information provided by States and airlines would be considered confidential, and only de-identified information and analysis would be reflected in the Annual Safety Report. Notwithstanding, the RSC/2 meeting noted with concern that only five (5) States provided replies to the following questions:

1. What are the top 5 reported incidents/occurrences that you come across? Can you provide us with details; flight phase, root causes, and actions taken?

2. How many of these reports are closed and how many remain pending without a solution? What is the average response time for investigating any incident or occurrence?

3. How do you rate your voluntary reporting system?

4. What are the main three challenges you face with regards to ensuring that a safety culture is maintained within your organization and within your home base operators?

2.7 In connection with the above, the RSC/2 meeting questioned about the mechanism to be used for the collection of safety data for the development of the ASR. Accordingly, the meeting agreed that the ASRT will develop a Draft Strategy for the collection of safety data for review and consideration by the RASG-MID/3 meeting.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

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

b) note the detailed information/analyses contained in **Appendix B** to this working paper; and

c) urge States and all Stakeholders to provide necessary safety data to the MID-ASRT for the development of the next edition of the Annual Safety Report.

Regional Aviation Safety Group - Middle East

(RASG-MID)

MID Region Annual Safety Report

Second Edition
January 2014

Second Edition, January 2014
Regional Aviation Safety Group – Middle East (RASG-MID)

RASG-MID

Annual Safety Report

Table of contents

1. Executive Summary…….…… 2
1.1 Regional Traffic Volumes…….3
2. Safety Information and Analysis……4
2.1 Reactive Safety Information……....4
2.1.1 Regional Accidents Rates ……..…4
2.1.2 Regional Fatal Accidents ……. …...5
2.1.3 Analysis of MID Accidents between 2008 and 2012 ……... …...5
2.1.3.1 Accidents categories and analysis……..... 5
2.1.3.2 Safety Focus Areas for MID Region (2008 to 2012)..……....9
2.1.3.3 MID Region Safety Performance – Safety Indicators(Reactive)…….. 12
2.2 Proactive Safety Information…… 13
2.2.1 Analysis of Audits……..... 13
2.2.1.1 ICAO USOAP-CMA ……..…….... 13
2.2.1.2 IATA Operational Safety Audit (IOSA) ……..…….…….... 15
2.2.1.3 IATA Safety Audit for Ground Operations (ISAGO) ……..…….…..... 15
2.2.2 Analysis of incidents and occurrences……..… 17
2.2.2.1 Incidents and Occurrences Reported by States …… 17
2.2.2.2 STEADES data ……..… 18
2.2.2.3 Incidents and occurences reported by airlines …….. 20
2.2.3 On demand analysis of identified risks or hazards…….. 21
2.2.3.1 Call-sign Confusion……... 21
2.2.3.2 Laser Attack ……..22
2.2.4 MID Region Safety Performance – Safety Indicators (Proactive) ……..23
2.3 Predictive Safety information……....24
2.3.1 FDM Trends and FOQA Data…….24
2.3.1.1 FDX data ……....24
2.3.2 Hazard Identification and Risk Assessment……..25
2.3.2.1 State Safety Program (SSP) ……25
3. Final Conclusions…….....27
List of Acronyms …….....28

1. Executive Summary

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 should first agree on the key risks areas.

The Second RASG-MID Annual Safety Report provides Member States and the aviation community with a high-level analysis of the air transport safety trends and indicators in the MID Region. 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

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.

Analysis of the reactive safety information showed that the three top fatal accident categories for the 2008-2012 period are:

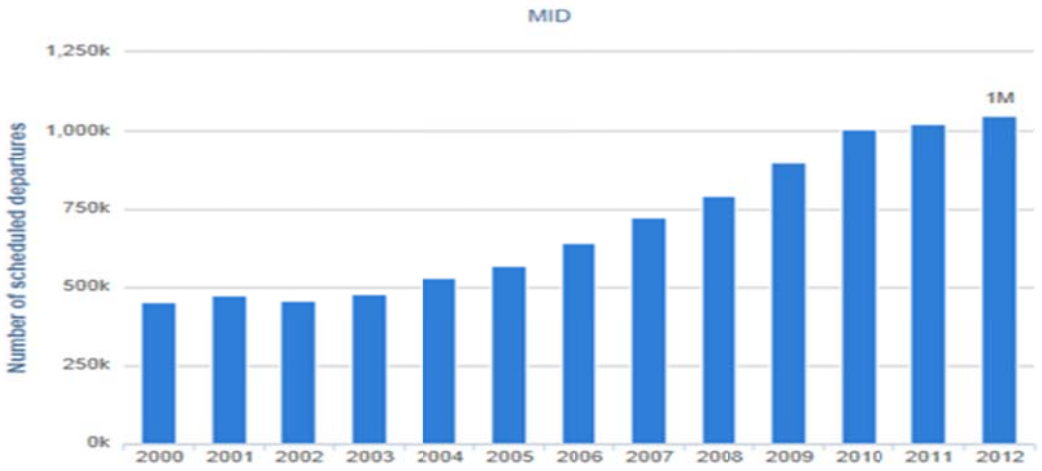
1. Runway and Ground Safety (RGS)
2. Loss of Control In-flight (LOC-I)
3. Controlled Flight Into Terrain (CFIT)

By contrast, the proactive safety information in this report, extracted from the results of the ICAO Universal Safety Oversight Audit Programme (USOAP), showed that 77% of audited Sates in the MID Region are with overall effective implementation (EI) over 60%.

It should be noted that the Reactive Information represents the largest portion of the Report. As the system matures and the processes for the collection of predictive information in the MID Region are established, balance between the contents of the three sections will be reached.

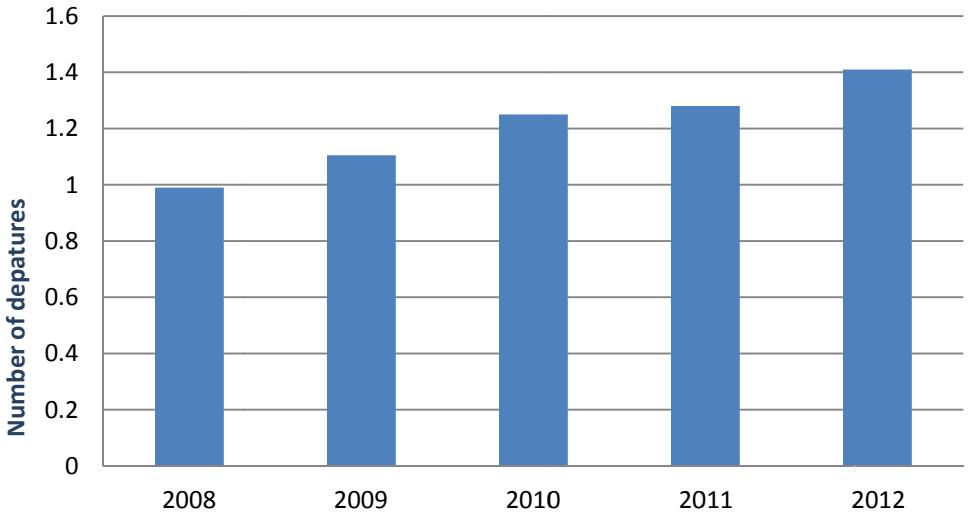
RASG-MID is committed to improving aviation safety and enabling seamless cooperation and communication among the main aviation safety stakeholders in the MID Region.

1.1 Regional Traffic Volumes



Regional Traffic Volume
Annually Scheduled Commercial Departures
Source: ICAO-iSTARS

	2008	2009	2010	2011	2012
Traffic Million departure	0.772	0.877	0.923	1.032	1.07



Regional Traffic Volume
Annually Departures
Source: IATA

	2008	2009	2010	2011	2012
Traffic Million departure	0.990	1.105	1.250	1.282	1.410

Note: *For the analyses carried out in this report, the IATA traffic data was used.*

2. Safety Information and Analysis

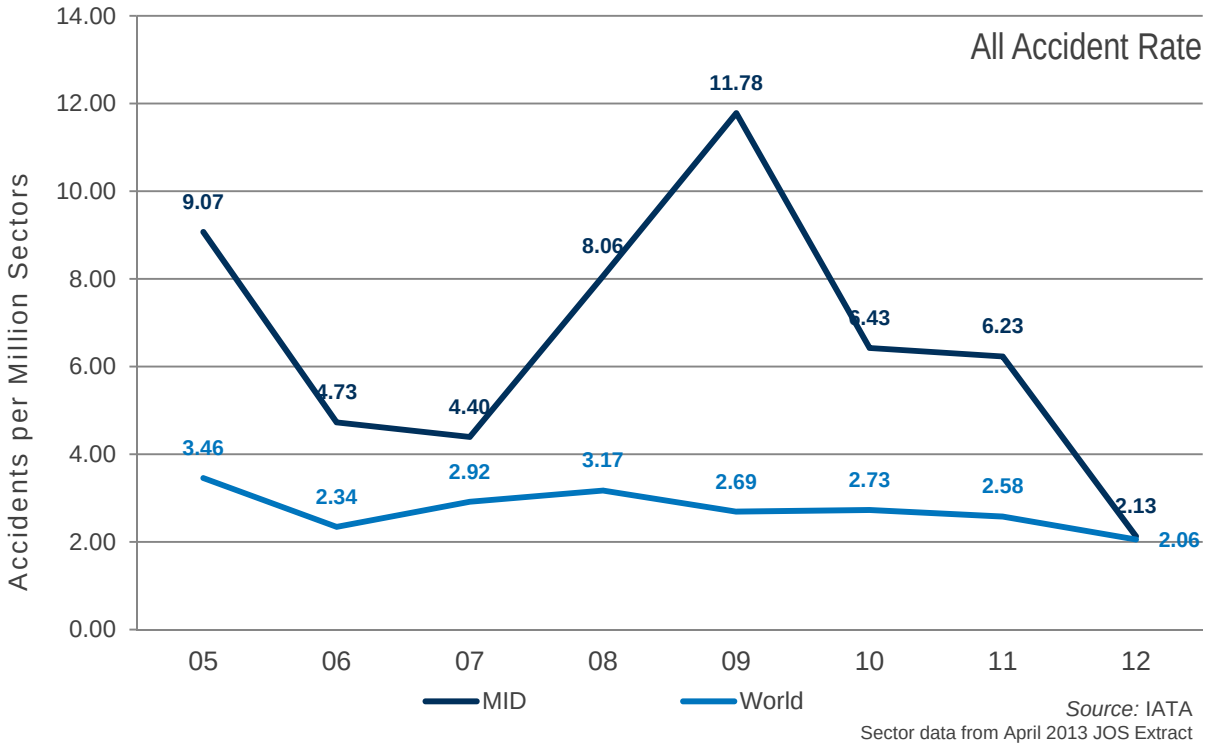
The following sections show the results of safety information analysis grouped as reactive, proactive and predictive safety information.

2.1 Reactive Safety Information

In accordance with the MID Region Safety Strategy, it was agreed 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 analyse reactive information consisted of retrieving safety data from IATA, ICAO and Boeing. For the IATA data, an effort was required to narrow the search to include only the fifteen (15) States of the Middle East Region.

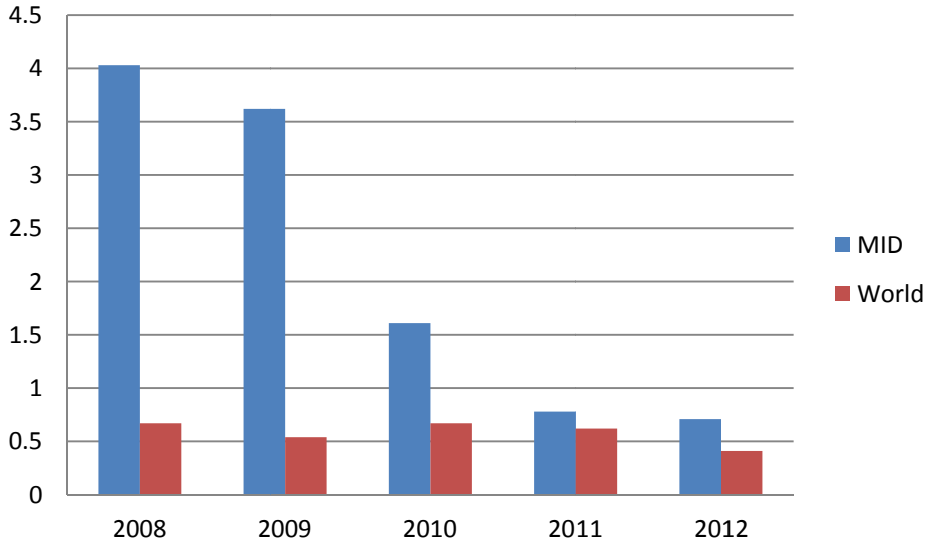
2.1.1 Regional Accidents Rates



Year		2008	2009	2010	2011	2012
MID	Accident Nr.	8	12	6	6	2
	Accident rate	8.06	11.78	6.43	6.23	2.13
World rate		3.17	2.69	2.73	2.58	2.06

2.1.2 Regional Fatal Accidents

Year	2008	2009	2010	2011	2012
MID	4.03	3.62	1.61	0.78	0.71
World	0.67	0.54	0.67	0.62	0.41



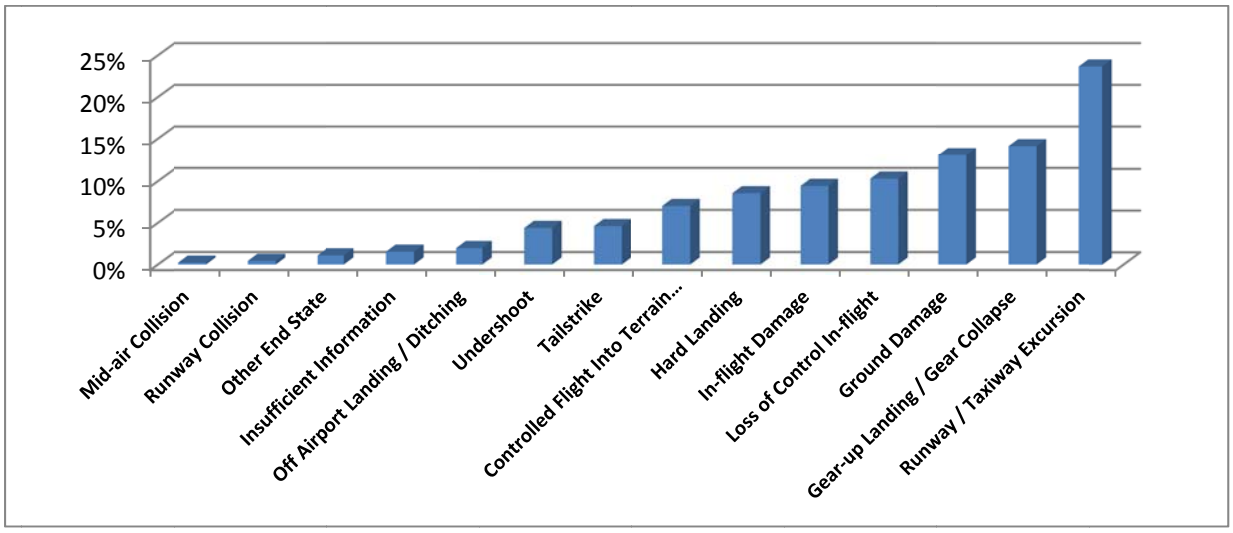
Regional Fatal Accidents Per Milion Depature
Source: IATA

2.1.3 Analysis of MID Accidents between 2008 and 2012

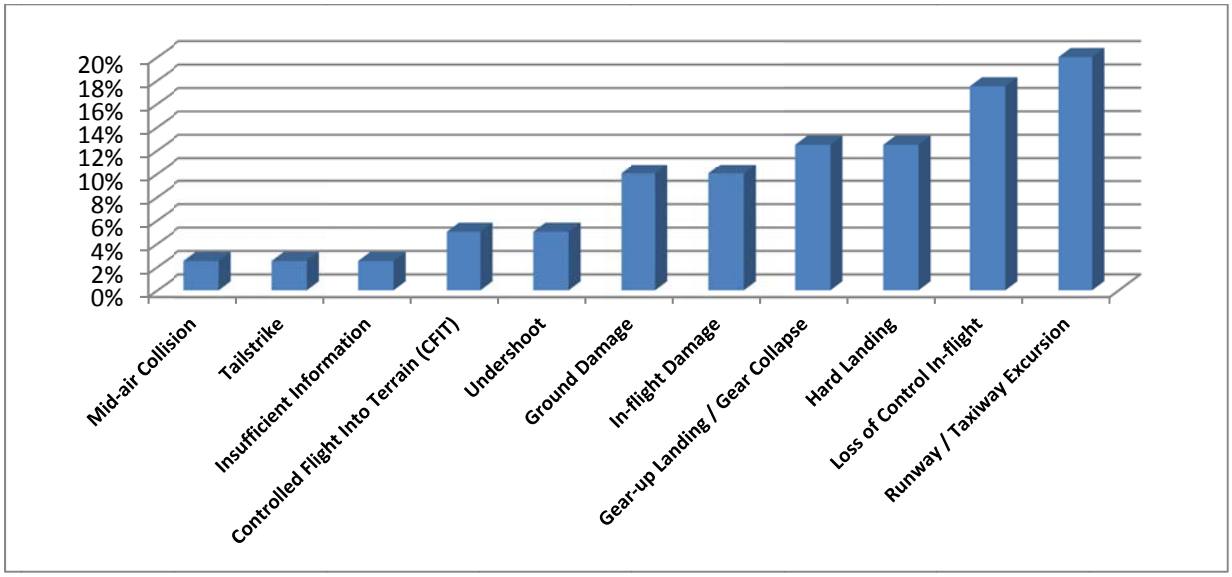
This analysis provides an overview of the accidents between 01 Jan 2008 and 31 Dec 2012.

2.1.3.1 Accidents categories and analysis

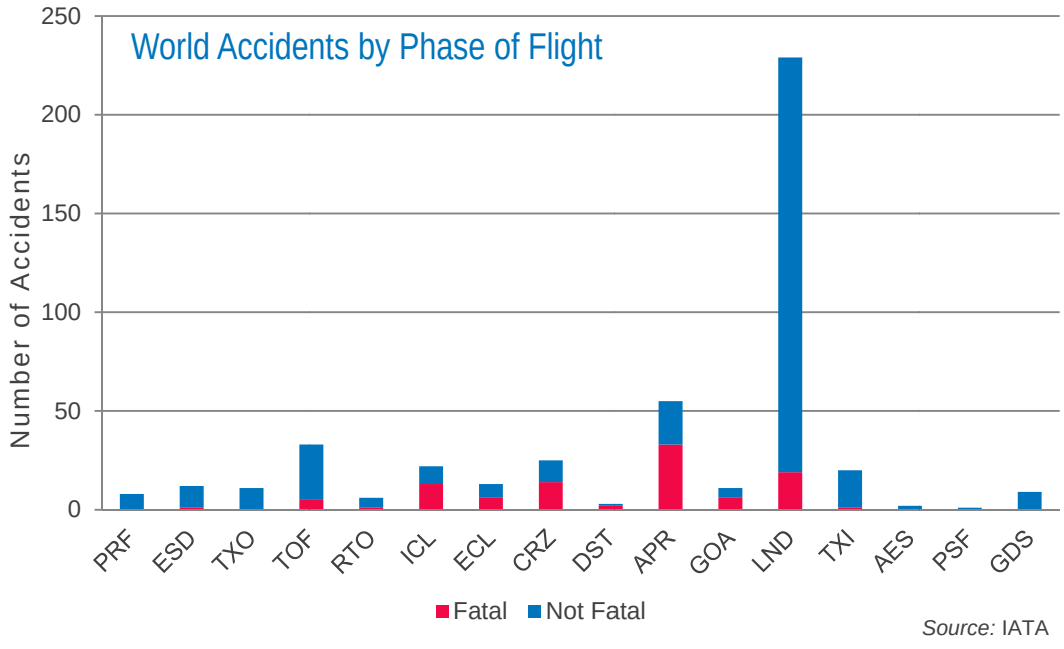
a) World Accident Categories: 2008-2012



b) MID Accident Categories: 2008-2012

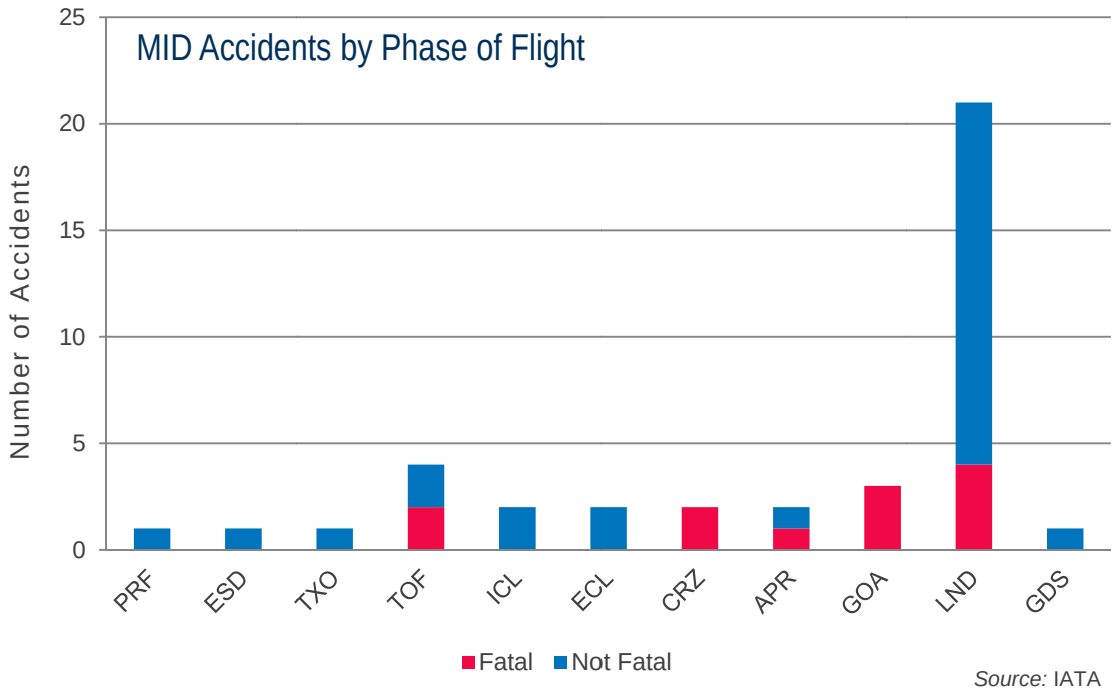


c) World Accident Flight Phases: 2008-2012



Source: IATA

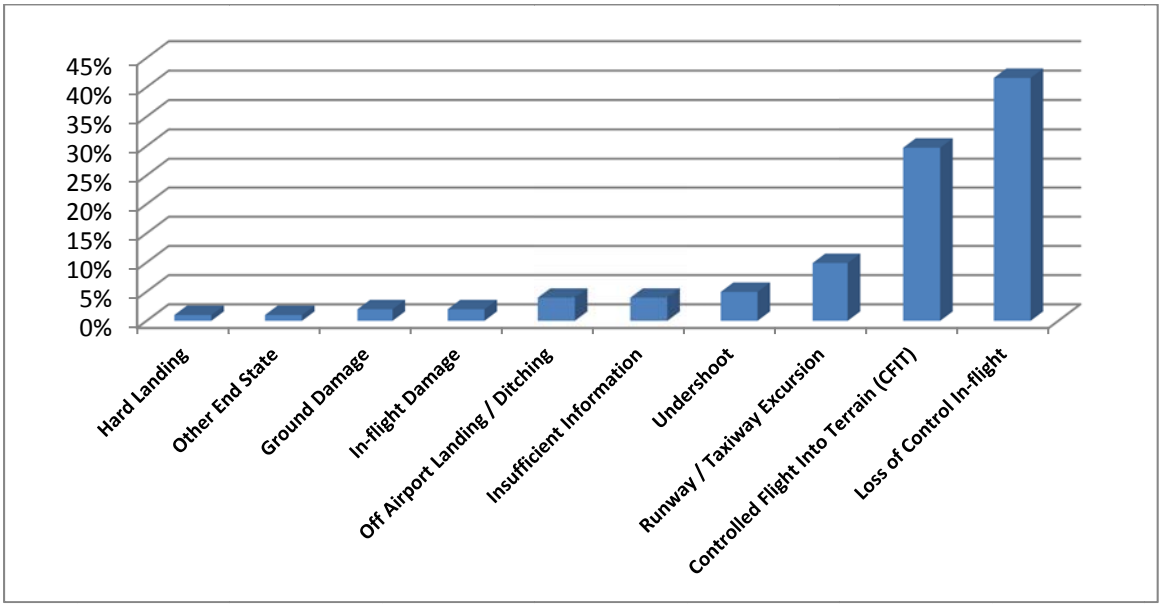
d) MID Accident Flight Phases: 2008-2012



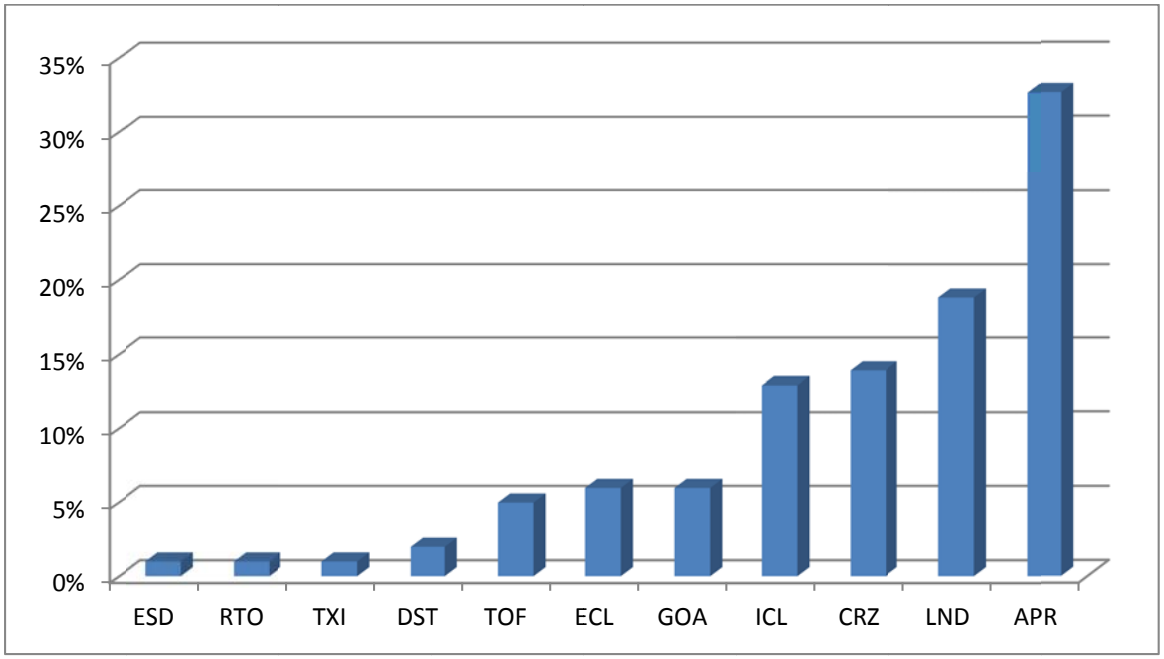
Source: IATA

e) World Fatal Accident Categories and Phases

i. Categories

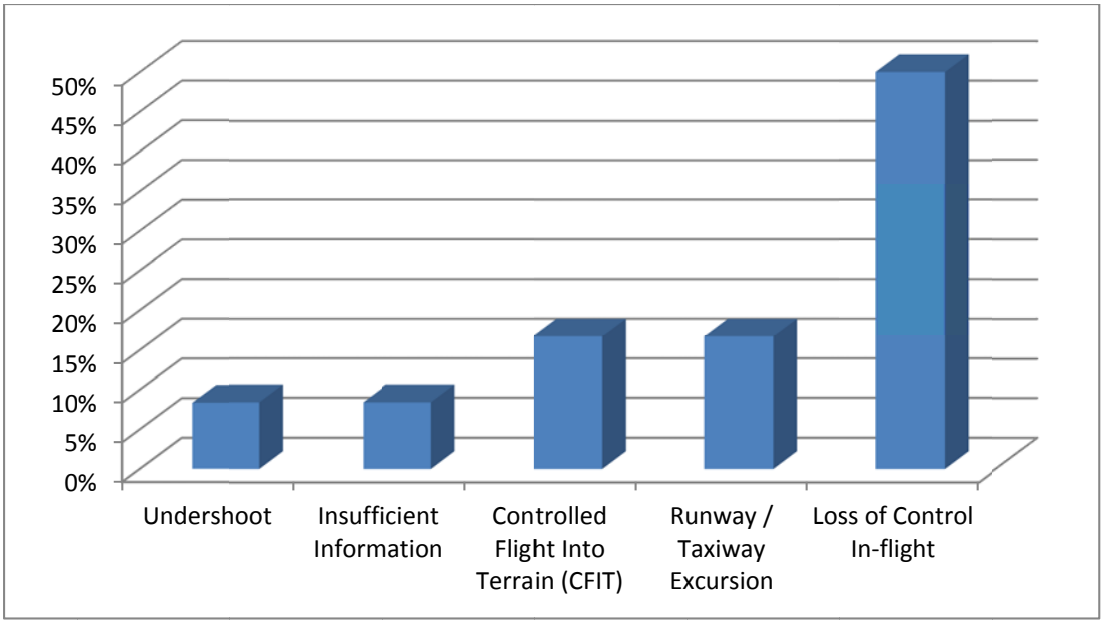


ii. Phases

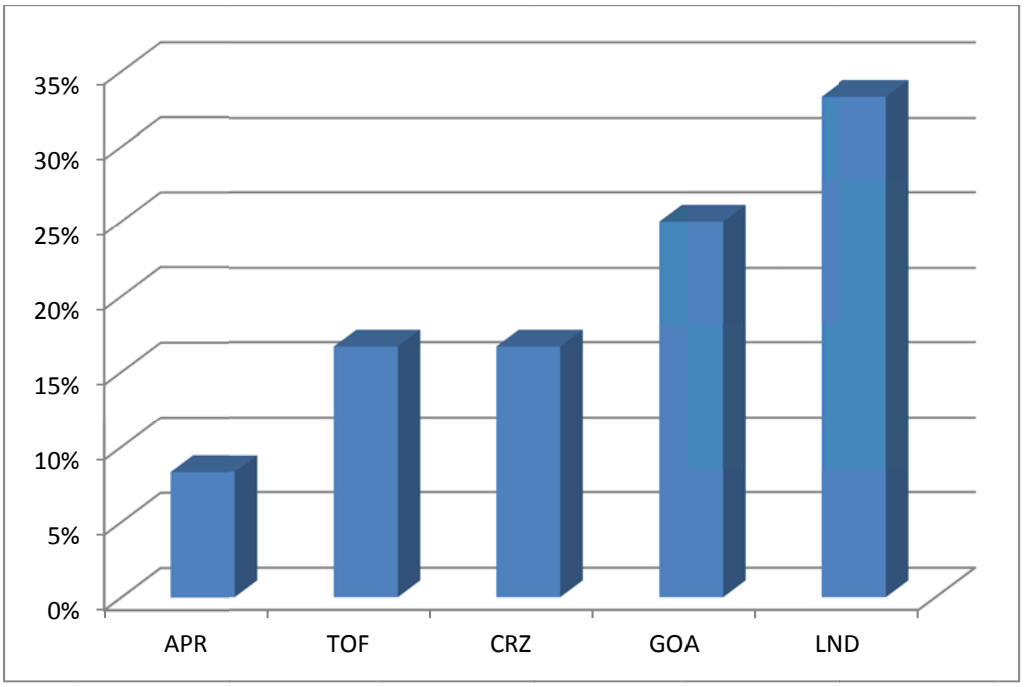


f) MID Fatal Accident Categories and Phases

i. Categories



ii. Flight Phases



2.1.3.2 Safety Focus Areas for the MID Region (2008 to 2012)

Taking a more in-depth look at the accidents statistics for the MID Region, the following is highlighted:

1. All accident rate in the MID region was above the World accident rate by an average of 3.86.
2. All MID accident rate among non-IOSA registered operators was above the World accident rate by an average of 6.23.
3. The most frequent accident 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 order to facilitate the identification and prioritization of the main Focus Areas (FAs), the accidents are categorized in term of frequency and severity. The severity assessment is based on the fatalities, injuries and damage to aircraft, property and equipment. The level of severity is categorized as follows:

1- Catastrophic: multiple deaths; serious damage to aircraft/equipment (destroyed);
2- Major: serious injury/fatalities; major aircraft/equipment damage; and
3- Minor: little consequences.

Accordingly, the following matrix shows the assessment for the top accidents categories;

Frequency / Severity	1	2	3	4	5
1	1	2	3	4	5
2	2	4	6	8	10
3	3	6	9	12	15

Loss of Control In-flight (LOC-I)

1. Trend 2008 to 2012

Year		**2008**	**2009**	**2010**	**2011**	**2012**
MID	**Accident Nr.**	3	3	0	1	0
	Accident rate	3.02	2.72	0	0.78	0
World rate		0.41	0.41	0.27	0.29	0.22

2. Severity of Outcomes

Fatal Accident Nr.	6
Non-Fatal Accident Nr.	1
Total Fatalities	415

Runway Excursion

1. Trend 2008 to 2012

Year		2008	2009	2010	2011	2012
MID	Accident Nr.	1	2	1	3	1
	Accident rate	1.01	1.81	0.80	2.34	0.71
World rate		0.81	0.69	0.58	0.48	0.58

2. Severity of Outcomes

Fatal Accident Nr.	2
Non-Fatal Accident Nr.	6
Total Fatalities	49

Controlled Flight into Terrain (CFIT)

1. Trend 2008 to 2012

Year		2008	2009	2010	2011	2012
MID	Accident Nr.	0	0	1	0	1
	Accident rate	0	0	0.80	0	0.71
World rate		0.20	0.06	0.20	0.28	0.16

2. Severity of Outcomes

Fatal Accident Nr.	2
Non-Fatal Accident Nr.	0
Total Fatalities	135

In-flight Damage

1. Trend 2008 to 2012

Year		2008	2009	2010	2011	2012
MID	Accident Nr.	2	1	1	0	0
	Accident rate	2.02	0.91	0.80	0	0
World rate		0.47	0.27	0.26	0.14	0.11

2. Severity of Outcomes

Fatal Accident Nr.	0
Non-Fatal Accident Nr.	4
Total Fatalities	0

In accordance with the agreed matrix for the assessment of the top accidents categories, the following table represents the categorization/assessment for the MID Region:

Accident Category	Frequency	Severity	Frequency/Severity
Runway / Taxiway Excursions	1	2	**2**
Loss of Control In-flight	2	1	**2**
Hard Landing	3	3	9
Gear-up Landing / Gear Collapse	4	3	12
In-flight Damage	5	2	10
Controlled Flight Into Terrain (CFIT)	6	1	**6**

Based on the above, the top three (3) Focus Areas (FAs) in the MID Region are:

a) Runway and Ground Safety (including RWY/TWY Excursions);
b) Loss of Control In-flight (LOC-I); and
c) Controlled Flight Into Terrain (CFIT)

2.1.3.3 MID Region Safety Performance - Safety Indicators (Reactive)

Safety Indicator	Safety Target	MID	Remark
Number of accidents per million departures	Reduce the accident rate to be in line with the global average by the end of 2017	2.13 (2012)	World 2.06 (2012)
Number of fatal accidents per million departures	Reduce the rate of fatal accidents to be in line with the global average by the end of 2017.	0.71 (2012)	World 0.41 (2012)
Number of Runway excursion-related accidents as a percentage of all accidents	Reduce Runway Excursions-related accidents by 50% by the end of 2017		Refer to the table below
Number of LOC-I related accidents as a percentage of all accidents	Reduce LOC-I related accidents by 50% by the end of 2017		Refer to the table below
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		Refer to the table below
Number of CFIT related accidents as a percentage of all accidents	Maintain CFIT related accidents below the global rate		Refer to the table below

Year	2008	2009	2010	2011	2012
MID Total accident	8	12	6	6	2
MID RWY Excursions-related accidents	1	2	1	3	1
% of All Accidents	12.5%	16.7%	16.7%	50%	50%
MID LOC-I -related accidents	3	3	0	1	0
% of All Accidents	37.5%	25%	0%	16.7%	0%
MID In-flight Damage -related accidents	2	1	1	0	0
% of All Accidents	25%	8.3%	16.7%	0%	0%
MID CFIT -related accidents	0	0	1	0	1
% of All Accidents	0%	0%	16.7%	0%	50%

2.2 Proactive Safety Information

This section of the Annual Safety Report focuses on proactive safety data analysis to identify additional risk areas in order to be addressed under the emerging risks area.

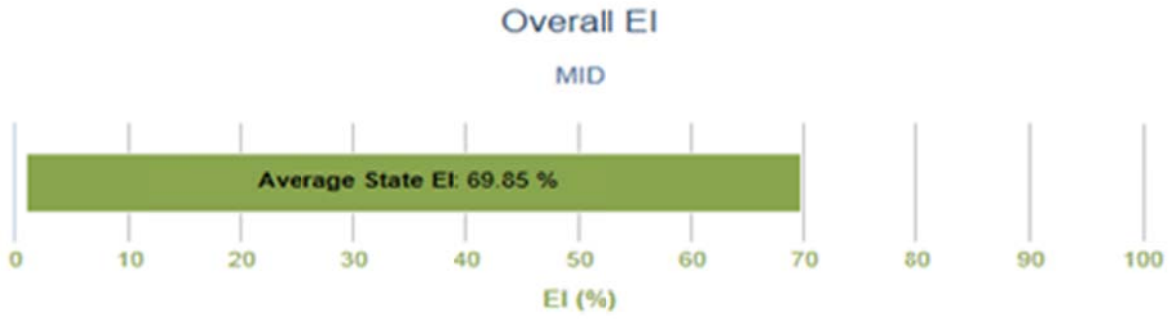
2.2.1 Analysis of Audits

2.2.1.1 ICAO USOAP-CMA

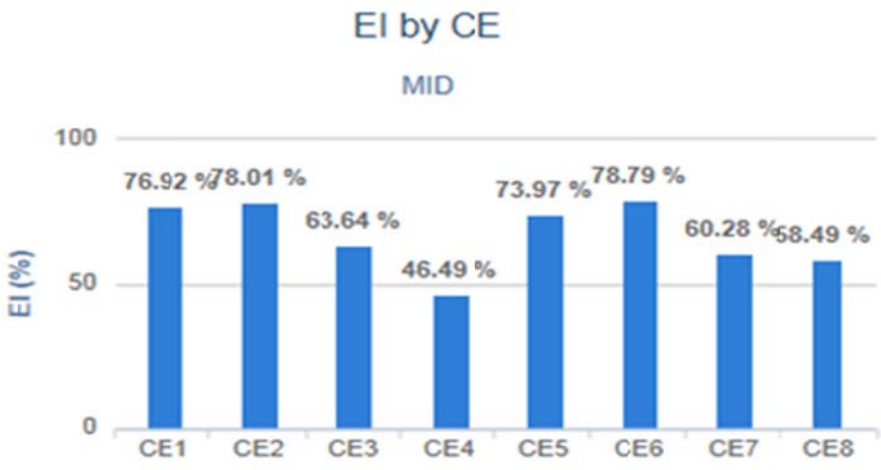
The Average Overall EI of the audited States (Only 13 States have been audited) in the MID Region is 69.85%, which is above the World Average 61.70 %. As the CMA has been officially launched since January 2013, the EI is continuously updated to reflect results from CMA activities including the ICAO Coordinated Validation Missions (ICVMs).

The results of the ICAO Universal Safety Oversight Audit Programme (USOAP) are presented to either show the Effective Implementation (EI) in reference to the eight critical elements (CEs) of the State's Safety Oversight System or the EI per Audit Areas. The lowest EI remains in CE4 (46.49%) related to Qualification and Training of Technical Staff involved in carrying out regulatory functions. Areas of PEL, OPS and AIR still show the highest EI in the MID Region.

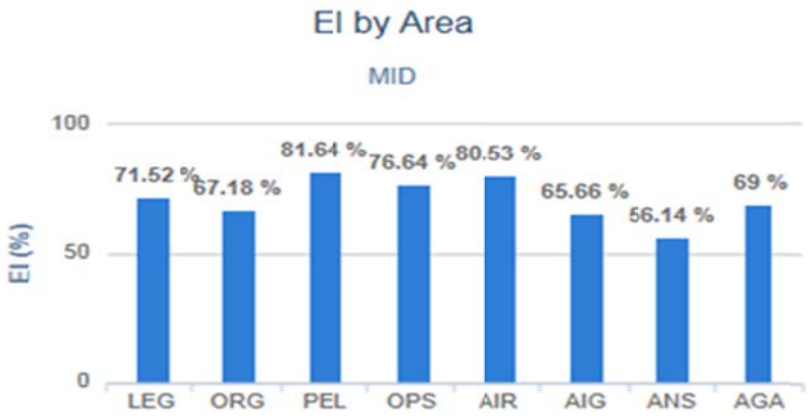
Note: The EI values may differ slightly from those published in the USOAP audit reports that were published from the period 2006 to 2010 due to changes in the EI calculation algorithm as well as changes in the protocol question grouping structure performed since the State's audit.



Average Overall EI of the Audited States in the MID Region

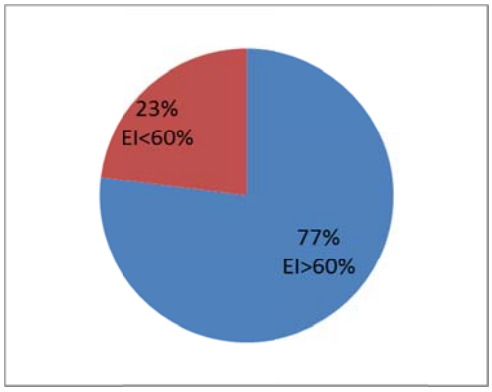


Effective Implementation (EI) per Critical Element (CE)



Effective Implementation (EI) per Audit Area

Currently, the percentage of audited Sates in the MID Region with an overall EI over 60% is 77%**.**



Audited Sates in the MID Region with an overall EI over 60%

The following States are with an overall EI over 60%:

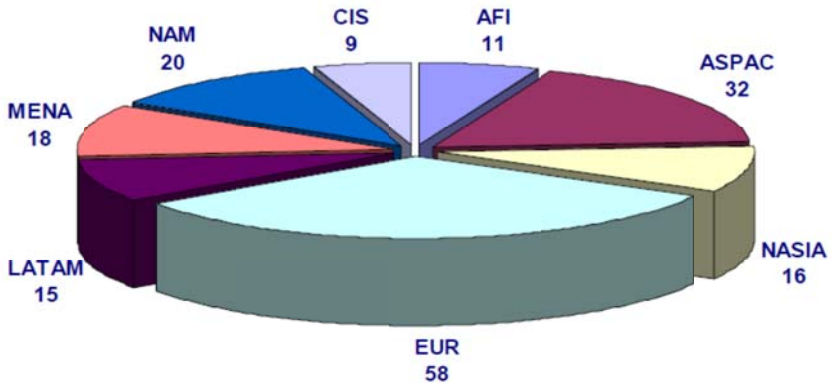
1- Bahrain
2- Egypt
3- Iran
4- Jordan
5- Kuwait
6- Oman
7- Qatar
8- Saudi Arabia
9- Sudan
10- UAE

2.2.1.2 IATA Operational Safety Audit (IOSA)

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

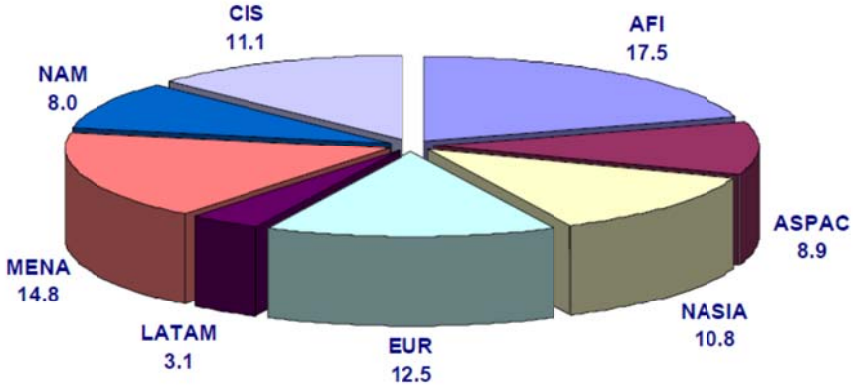
Total number of captured reports is 179 distributed in the regions as follows:

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

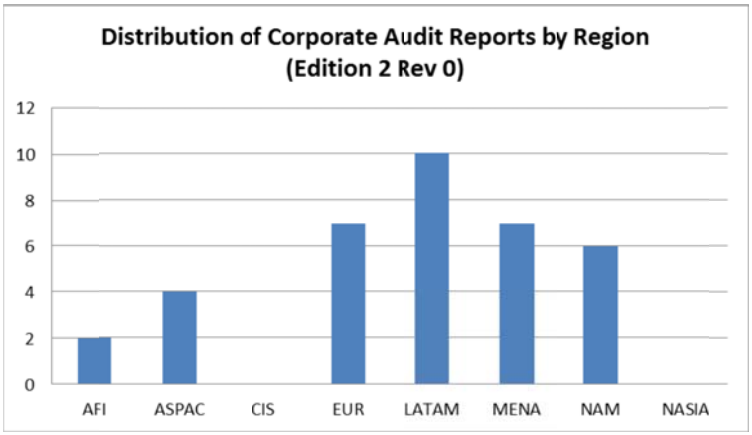


2.2.1.3 IATA Safety Audit for Ground Operations (ISAGO)

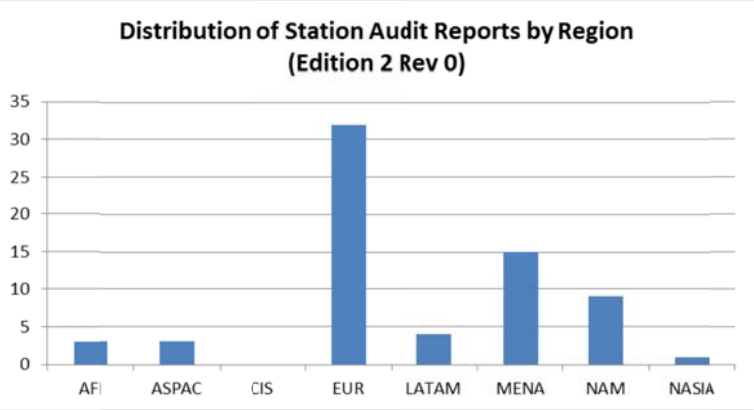
The ISAGO audit results analysis captured under this section cover the period between May 2010 and January 2012.

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.

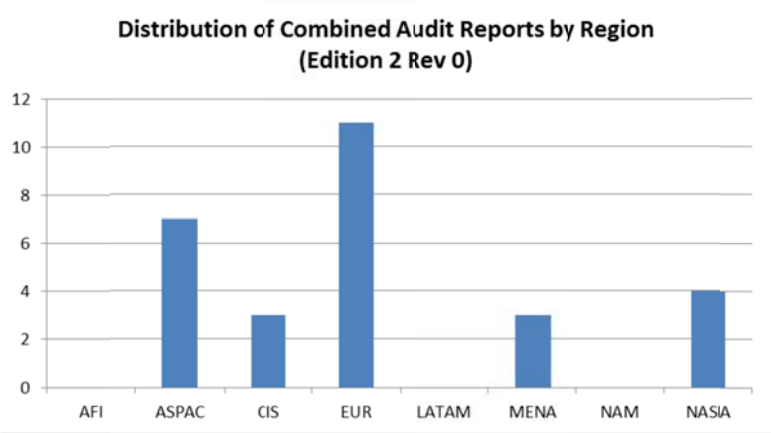
Corporate Audits:



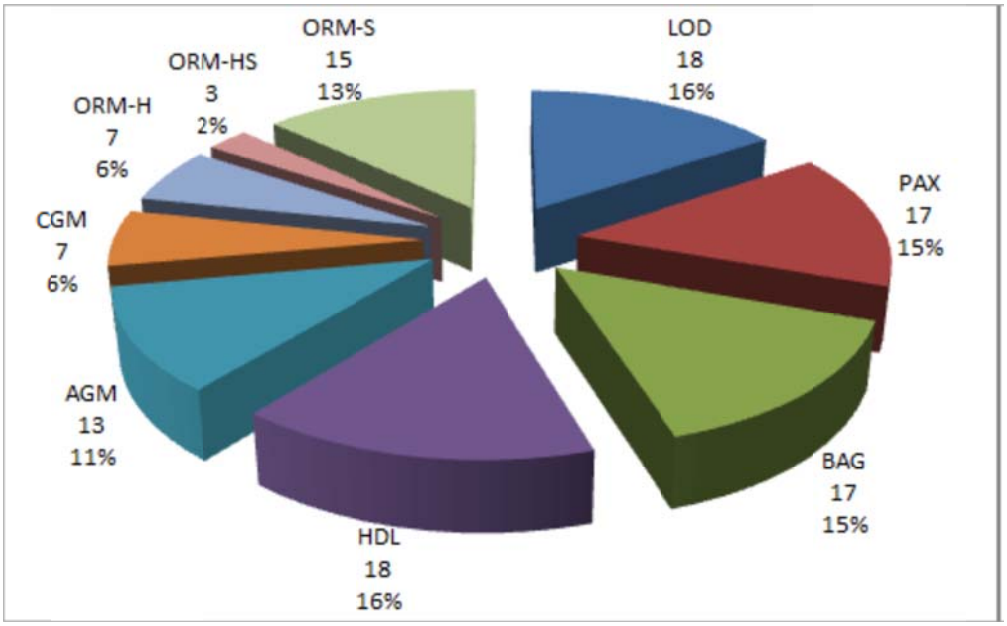
Station Audit:



Combined Audits:



Distribution of Findings for MENA:



2.2.2 Analysis of incidents and occurrences

2.2.2.1 Incidents and Occurrences Reported by States

As part of the proactive data analysis, States and airlines have been invited to contribute to the Annual Safety Report by providing incidents/occurrences data. In this respect, as a follow-up action to the RASG-MID/2 Conclusion 2/1, the ICAO MID Regional Office urged States to provide their data related to incidents and safety occurrences. All data and information provided by States and airlines were considered confidential and only de-identified information and analysis are reflected in the Annual Safety Report. Notwithstanding, only five (5) States provided replies to the following questions:

1. What are the top 5 reported incidents/occurrences that you come across? Can you provide us with details; flight phase, root causes, and actions taken?

2. How many of these reports are closed and how many remain pending without a solution? What is the average response time for investigating any incident or occurrence?

3. How do you rate your voluntary reporting system?

4. What are the main three challenges you face with regards to ensuring that a safety culture is maintained within your organization and within your home base operators?

From the received information, the top 5 reported incidents/occurrences are as follows:

- ATC Reports including conflicting traffic (unknown traffic) and airspace deviations (non-adherence to FPL route);
- Diversions;
- Level Bust;
- unstable approach;
- CFIT; and
- Wake Turbulence.

And the main reported root causes:

- Human errors (non-compliance with procedures, lack of awareness, etc);
- MET conditions (wind shear); and
- Aircraft system failure/malfunction.

2.2.2.2 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.

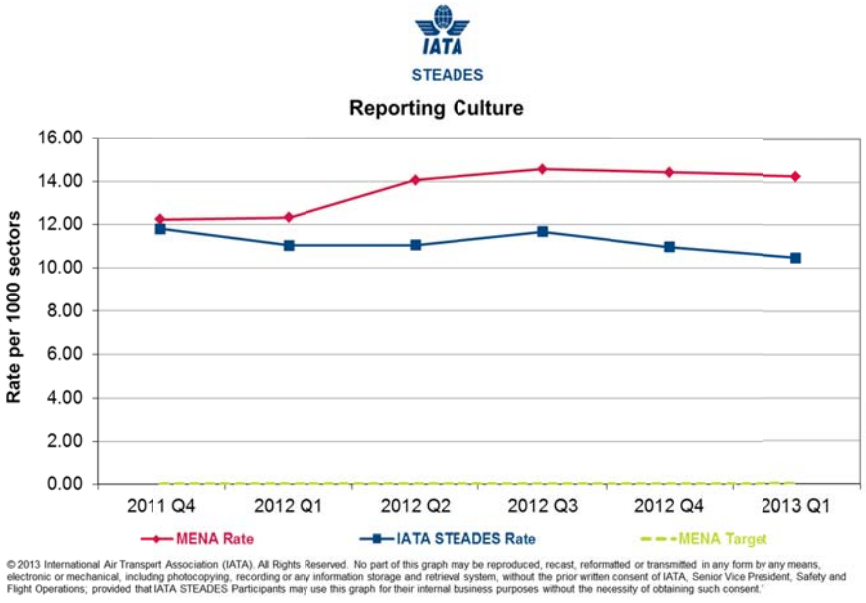
The scope of analysis captured in this report covers the period Q4 2011 to Q1 2013.

STEADES captures the following events;

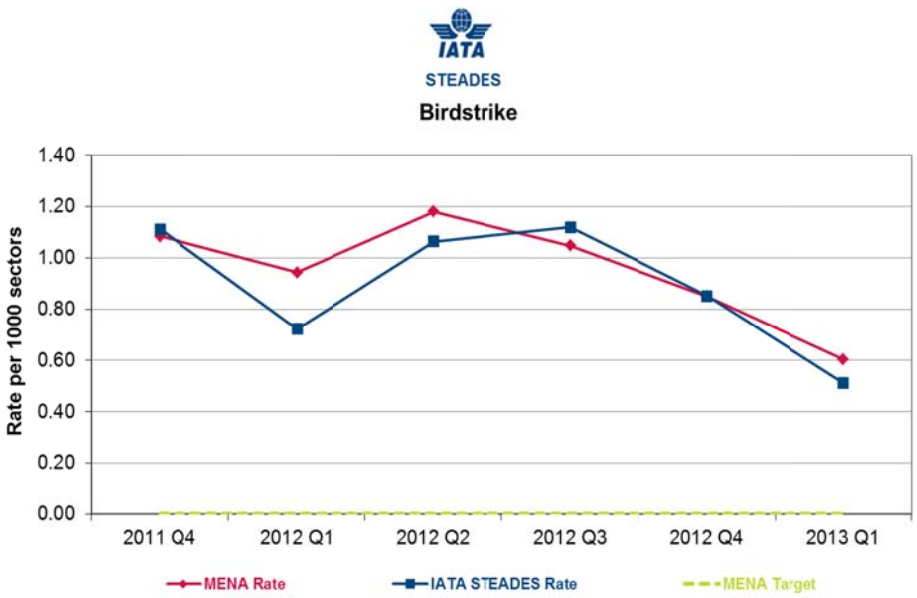
1. Altitude deviation
2. Birdstrike
3. Configuration warning – Flaps
4. Configuration warning – Gear
5. Deep landing
6. EGPWS/GPWS warning
7. EGPWS/GPWS Windshear
8. Hard/heavy landing
9. Stall warning
10. Rejected take-off
11. Runway/taxiway incursion
12. TCAS RA
13. Unstable approach
14. Engine In-flight Shutdown

For the purpose of this report, some events are captured to complement the analysis under different sections of the report and show trends that can support the work of RASG-MID.

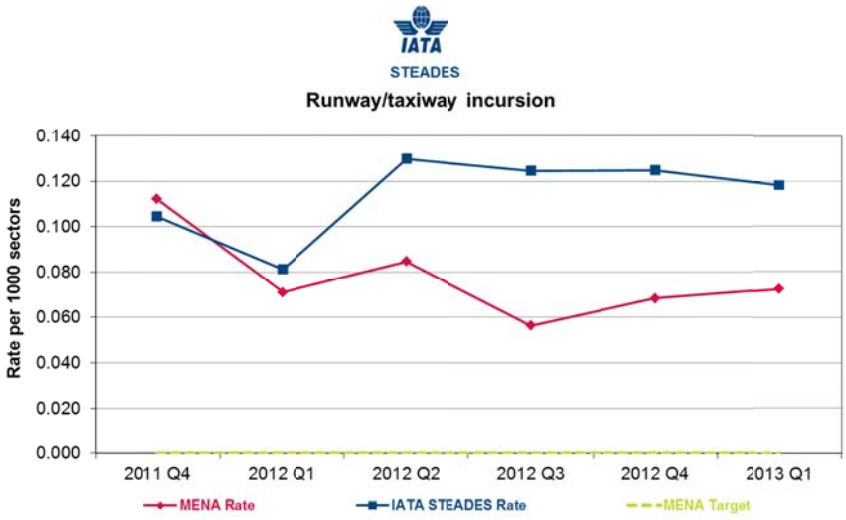
Reporting Culture



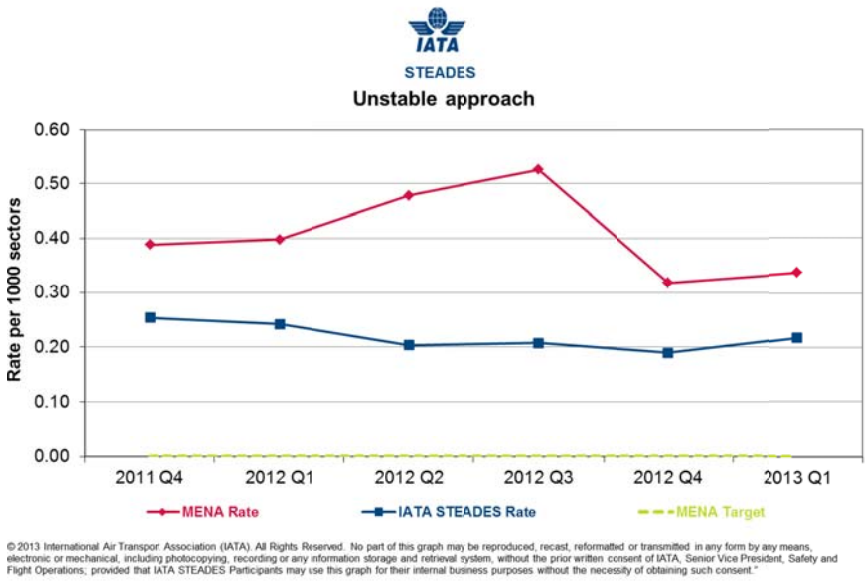
Birdstrike



Runway/taxiway Incursion



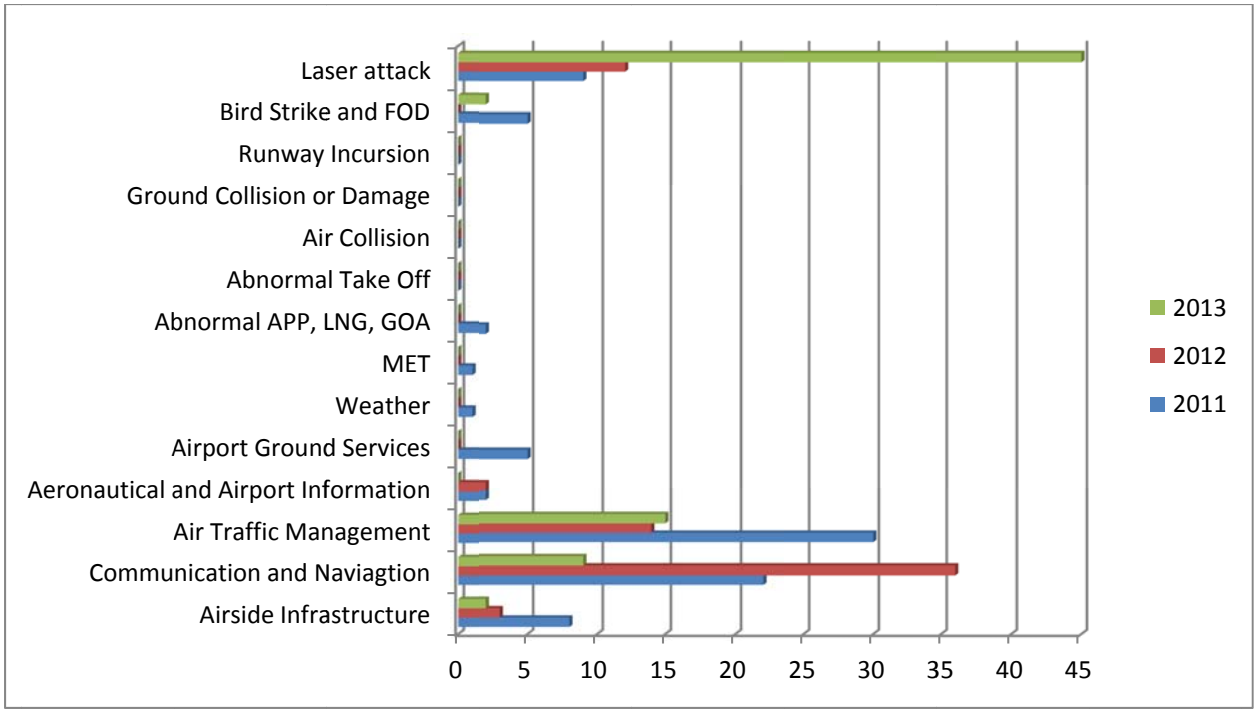
Unstable Approach



2.2.2.3 Incidents and occurrences reported by airlines

ATS incidents reported by airlines in the MID region were collected to highlight safety risk areas that need to be addressed.

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.



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

2.2.3 On demand analysis of identified risks or hazards

2.2.3.1 Call-sign Confusion

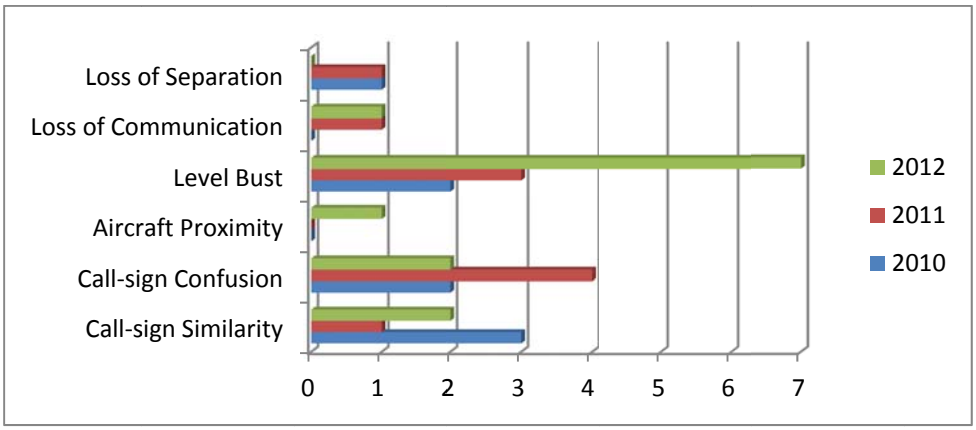
Pursuant to the RASG-MID/2 meeting, a study was launched to collect reliable data over a specified period of time, to ascertain the magnitude of the safety risk resulting from call-sign confusion, and confirm the categories of contributing factors in the MID Region.

The call-sign confusion survey was distributed to the 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.

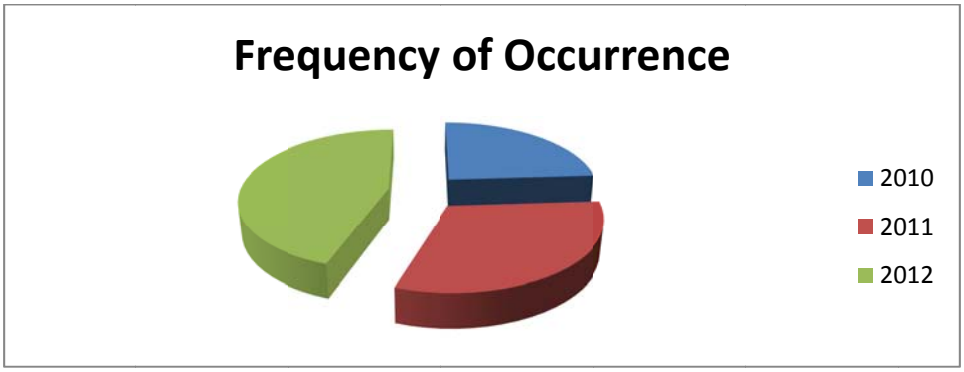
The following charts illustrate the collected responses.

1. Airline Responses

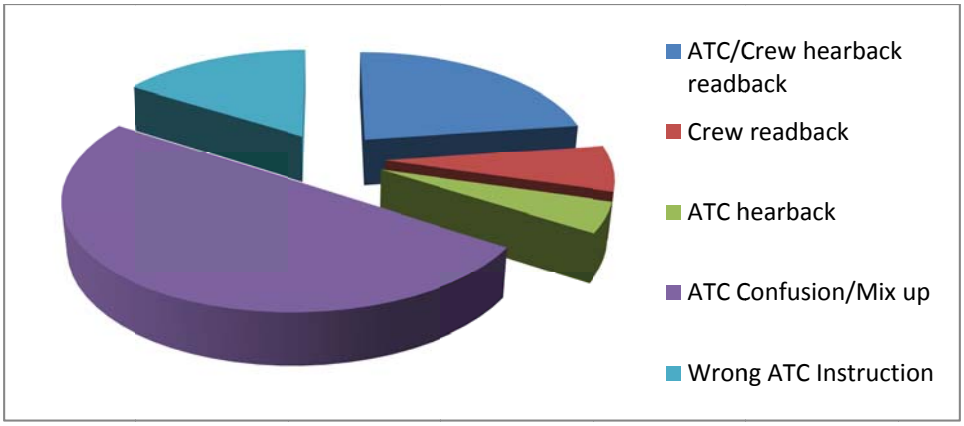
Nature of Occurrence



Frequency of Occurrence



Main root Cause



2.2.3.2 Laser Attack

Laser attack has been identified as a risk area, which is considered as a threat to aviation safety and security. A survey will be conducted and the assessment of the associated risks will be included in the next edition of the Annual Safety Report.

2.2.4 MID Region Safety Performance - Safety Indicators (Proactive)

Safety Indicator	Safety Target	MID	Remark
Number of States with an EI score less than 60% for more than 2 areas (LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA)	Max 3 States with an EI score less than 60% for more than 2 areas and an overall EI over 60%, by the end of 2015	6 States	6 States with an EI <60% for more than 2 areas 1 State with an EI <60% for 2 areas 2 States with an EI <60% for 1 area 4 States with an EI >60% for all areas 8 States have an EI <60% for ANS
Number of States with an overall EI over 60%	All the 15 MID States to have at least 60% EI by the end of 2016	10 States	
Number of Significant Safety Concerns	No significant Safety Concern by end of 2016	1	
Number of certified international aerodrome as a percentage of all international aerodromes	50% of the international aerodromes certified by the end of 2015; and 80% of the international aerodromes certified by the end of 2016	41% (28 of 68)	
Use of the IATA Operational Safety Audit (IOSA), to complement safety oversight activities	Maintain at least 60% of the MID airlines to be certified IATA-IOSA by the end of 2015 at all times; and 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	50% of the Ground Handling service providers to be certified IATA-ISAGO by the end of 2015 All Ground Handling service providers to be certified IATA-ISAGO by the end of 2017 The IATA Ground Handling Manual (IGOM) endorsed as a reference for ground handling safety standards by all MID States by end of 2015		

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 at regional level. However, initiatives have been undertaken to advance capabilities to gather and analyze predictive safety information within the framework of the MID- Safety Support Team (MID-SST). 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 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.

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.

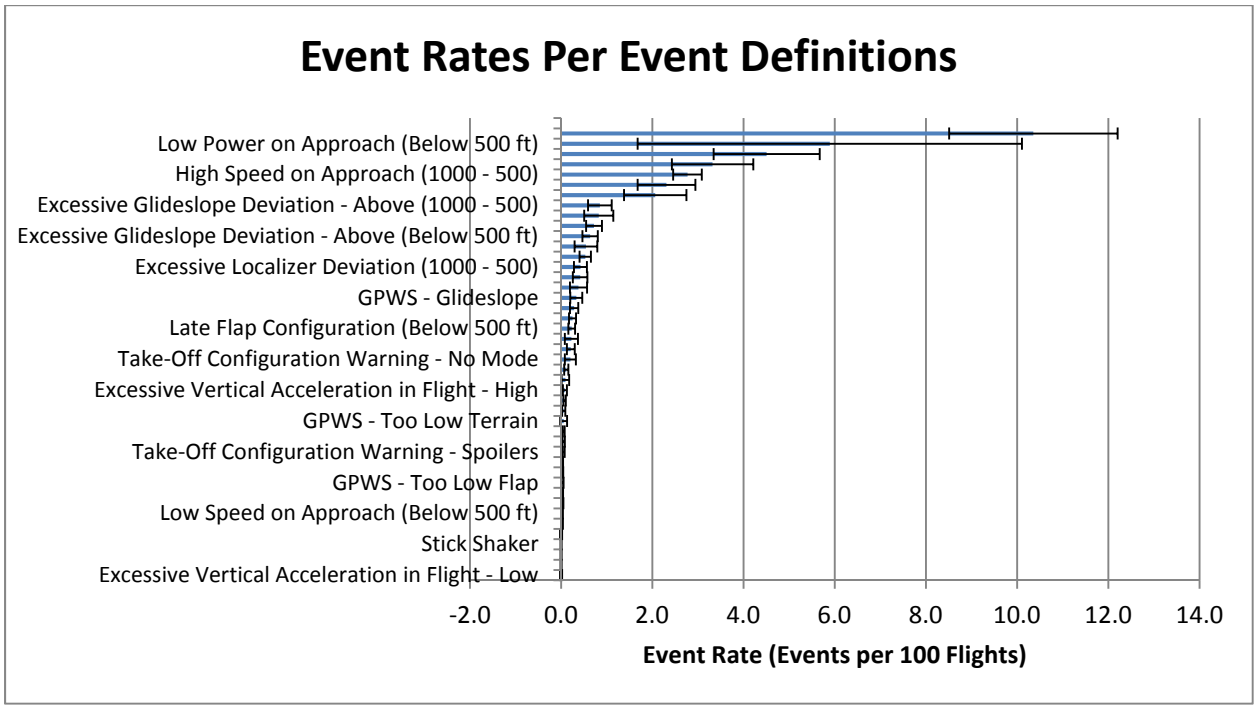
2.3.1 FDM Trends and FOQA Data

2.3.1.1 FDX data

One good source for predictive data is airline operators' Flight Data Monitoring systems (FDM) and Flight Operations Quality Assurance Programmes (FOQA). To assist in the access of such data, IATA has established the Flight Data Exchange (FDX) database.

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 chart was developed based on FDX data related to AFI and MENA participating airlines. Future editions of the Annual Safety Report would include more representative charts of the Middle East.



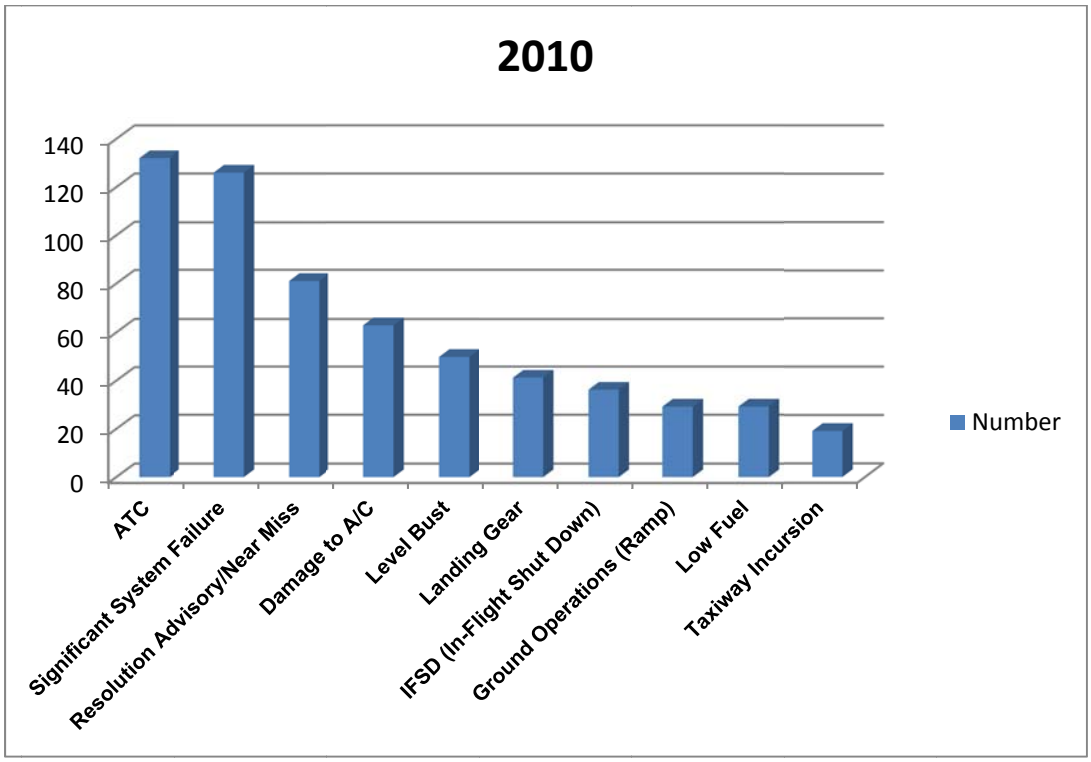
2.3.2 Hazard Identification and Risk Assessment

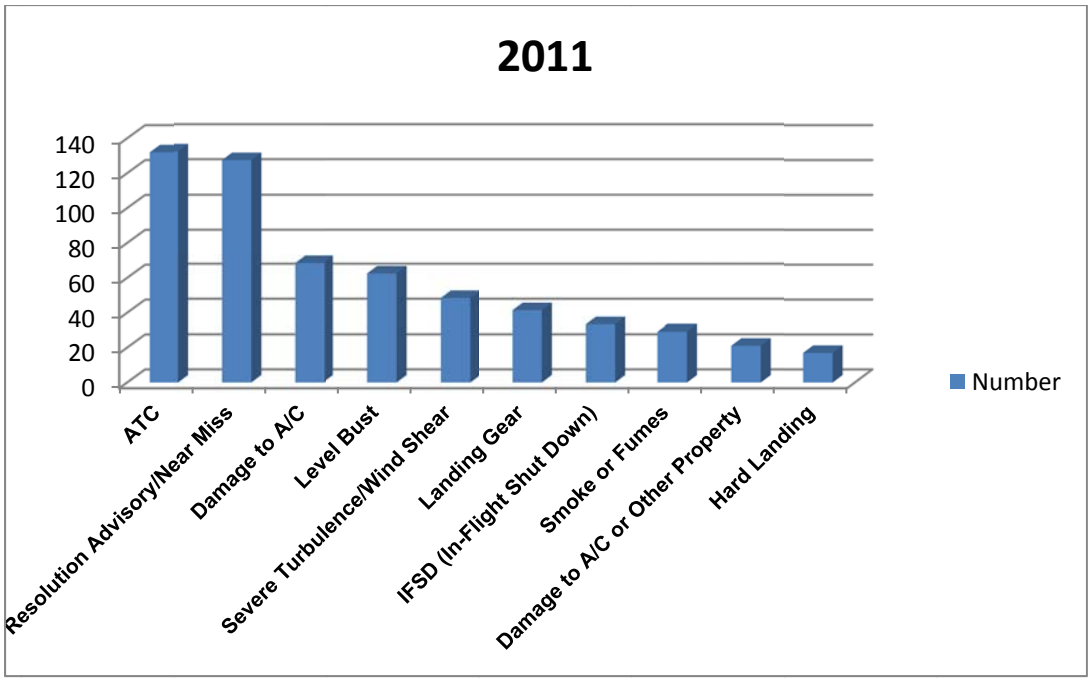
2.3.2.1 State Safety Programme (SSP)

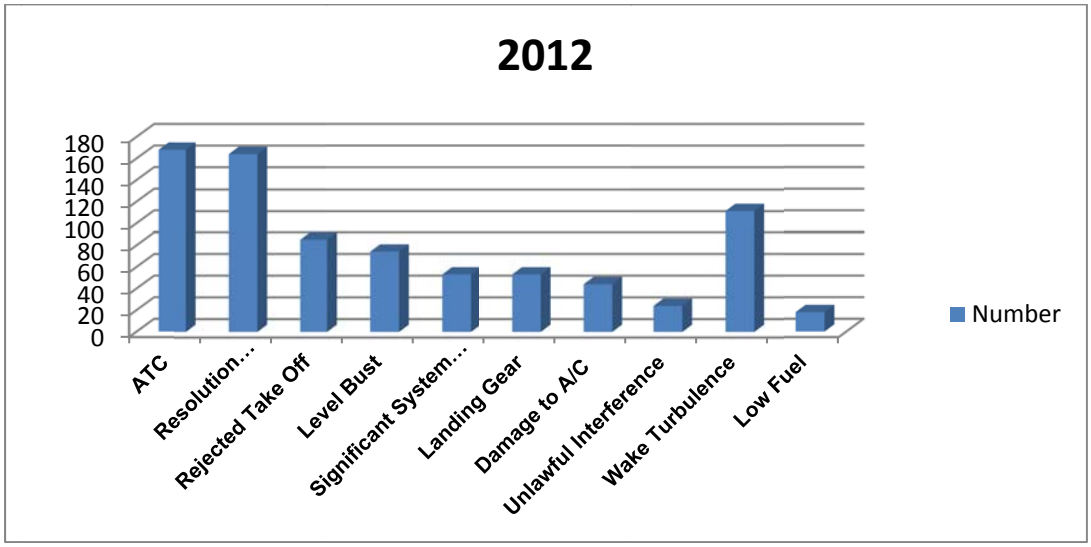
The MID-ASRT will collect events from States based on data captured within local SSP/SMS programmes. For this report, only one State reported their events. The upcoming editions of the Annual Safety Report would include more in-depth analysis of safety collected from SSP/SMS programmes and would provide predictive trends analysis to develop necessary risk management strategies.

Events Captured by the UAE

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




2011
140
120
100
80
60
40
20
0
ATC
Resolution Advisory/Near Miss
Damage to A/C
Level Bust
Severe Turbulence/Wind Shear
Landing Gear
IFSD (In-Flight Shut Down)
Smoke or Fumes
Damage to A/C or Other Property
Hard Landing
Number


2012
180
160
140
120
100
80
60
40
20
0
ATC
Resolution...
Rejected Take Off
Level Bust
Significant System...
Landing Gear
Damage to A/C
Unlawful Interference
Wake Turbulence
Low Fuel
Number

3. Final Conclusions

In regard to Reactive Safety Information, the data analyzed for the MID Region demonstrated that Runway and Ground Safety (RGS), Loss of Control In-flight (LOC-I) and Controlled Flight Into Terrain (CFIT) represent the three (3) Focus Areas (Fas). In term of fatality, LOC-I continues to be the top fatal accident category for the 2008 - 2012 period.

Although In-Flight Damage (IFD) is no longer considered as one of the main risk areas according to the matrix of identification and prioritization of the main FAs, it will be addressed under the Emerging Risks Area.

The top contributing factors identified in the analysis include:

1- Safety Management
2- Aircraft Malfunction
3- Maintenance Events
4- SOP Adherence / SOP Cross-verification
5- Unstable Approaches
6- Log/floated/bounced/firm/off-centre/crabbed land
7- Monitor/cross check
8- Overall crew performance

Proactive safety information shows that the Average Overall EI of the audited States (13 States) in the MID Region is 69.85%, which is above the World Average 61.70 %, and that 10 States are with an overall EI over 60%. Areas of PEL, OPS and AIR still show the highest EI in the MID Region. Effort should be made to improve States' safety oversight capabilities in the area of ANS and Aerodromes as well as the AIG capabilities.

All accident rate in the MID Region was above the World accident rate by an average of 3.86; whereas, all MID accident rate among non-IOSA registered operators was above the World accident rate by an average of 6.23.

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

Mechanisms for gathering and processing predictive safety information at regional level should be developed in order to collect and analyse safety data to proactively identify safety concerns before accidents and/or incidents occur, to develop timely mitigation and prevention measures.

MID-ASRT will be working on collection and analysis of Predictive Safety Data within 2014, to drive safety activities under RASG-MID.

The RASG-MID Annual Safety Report is a timely, unbiased and transparent source of safety related information essential for all aviation stakeholders interested in having a tool to enable sound decision-making on safety related matters.

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
DIP	Detailed Implementation Plan
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)
RAST	Regional Aviation Safety Group
RE	Runway excursion(departure or landing)
RI	Runway Incursion
SEI	Safety Enhancement Initiative
SMS	Safety Management System
SOP	Standard Operating Procedure
SSP	State Safety Programme
UAS	Undesirable Aircraft State
USOAP	Universal Safety Oversight Audit Programme

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:

Ms. Ruby Sayyed
International Air Transport Association (IATA)

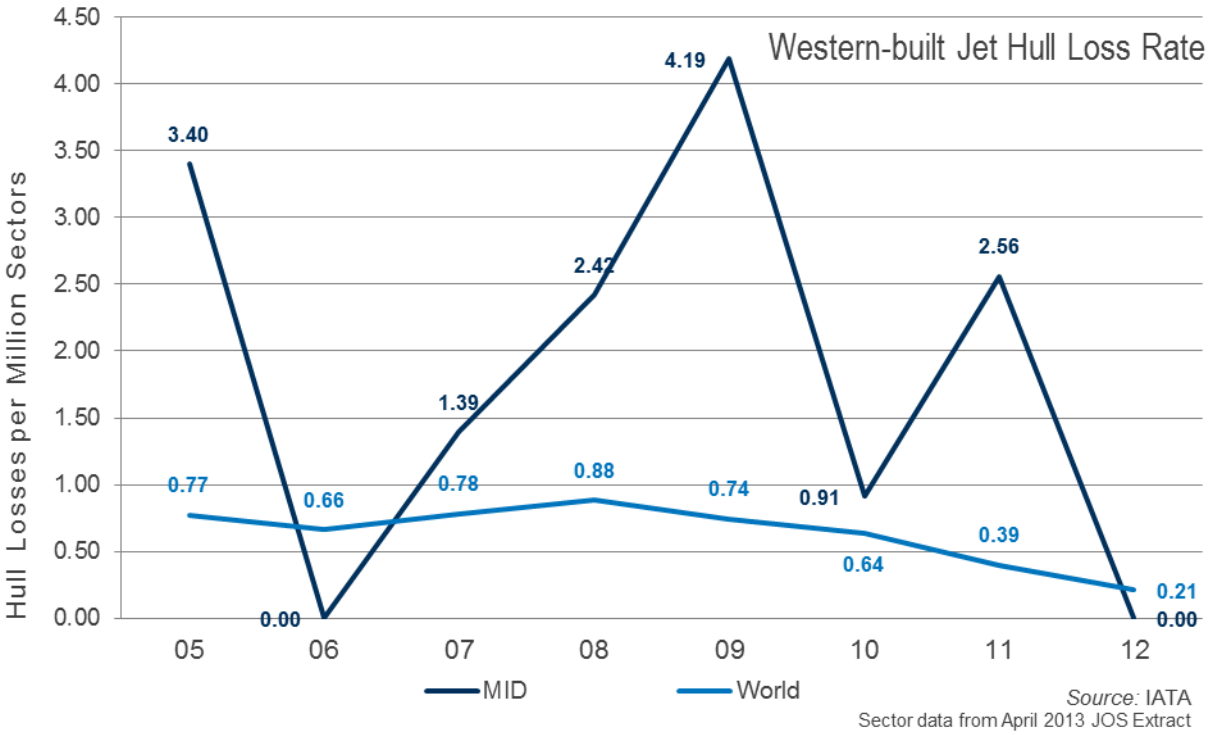
Mr. Mohamed Smaoui and Mr. Mashhor Alblowi
International Civil Aviation Organization (ICAO)

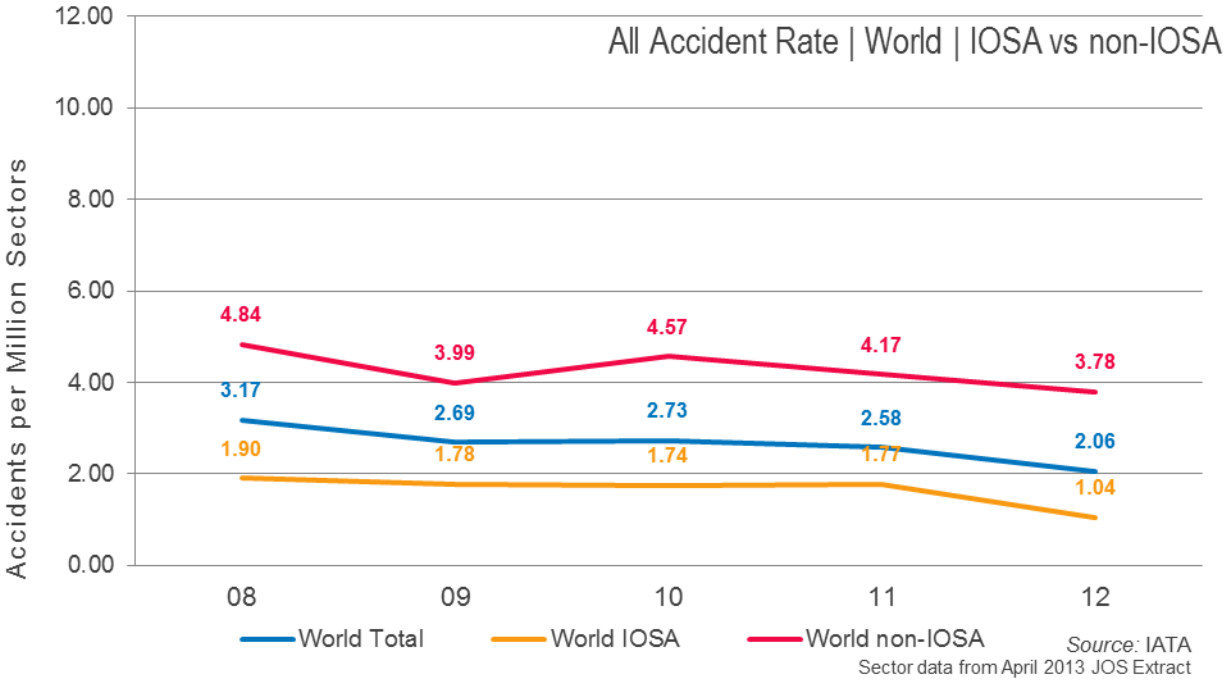
-oOo-

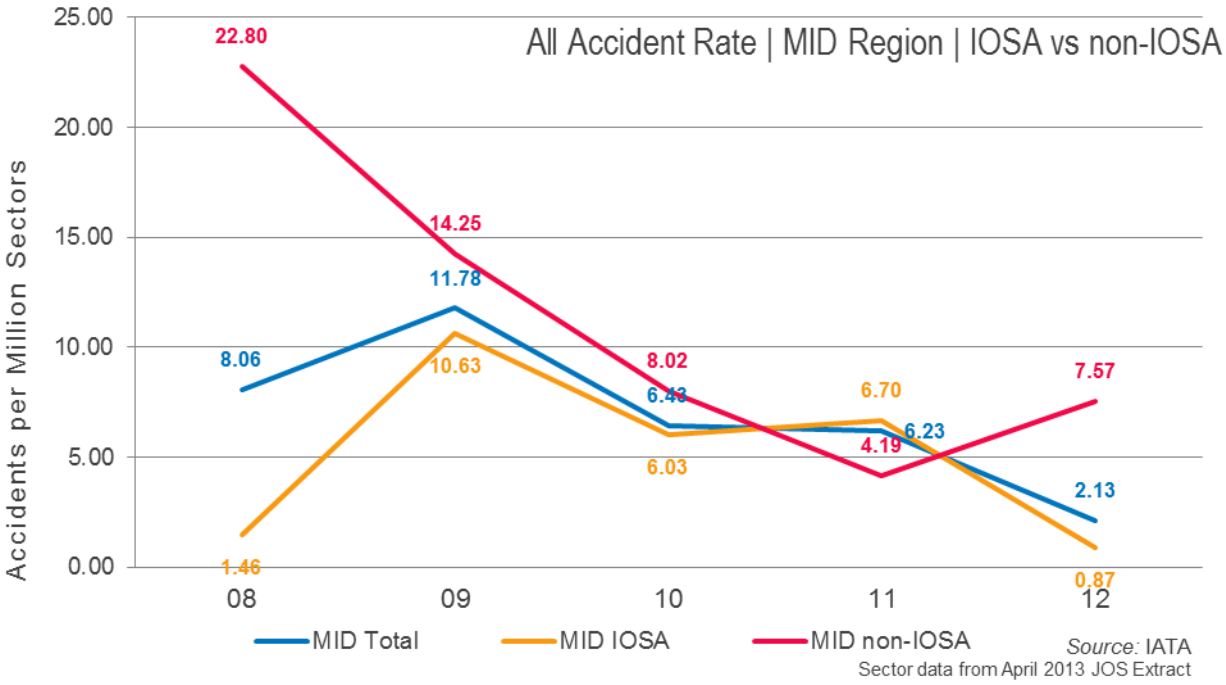
APPENDIX B

Detailed Information and Analysis for the MID Region Annual Safety Report – Second Edition

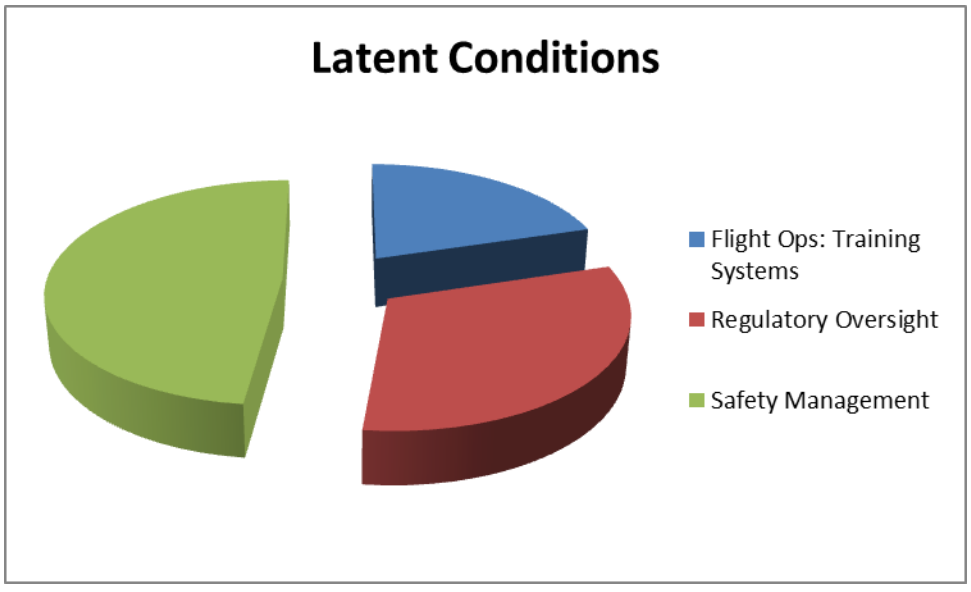
1. Yearly Trends

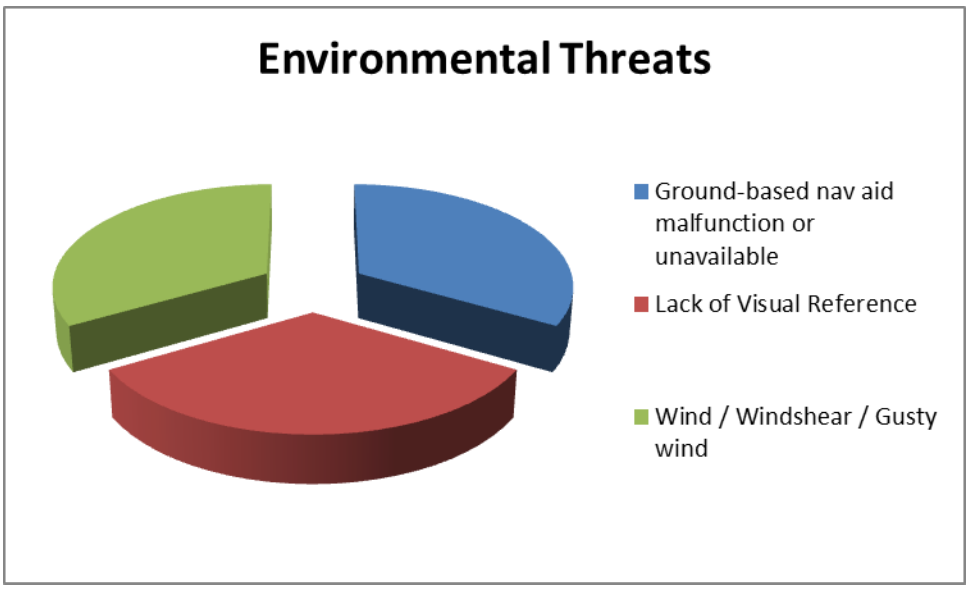


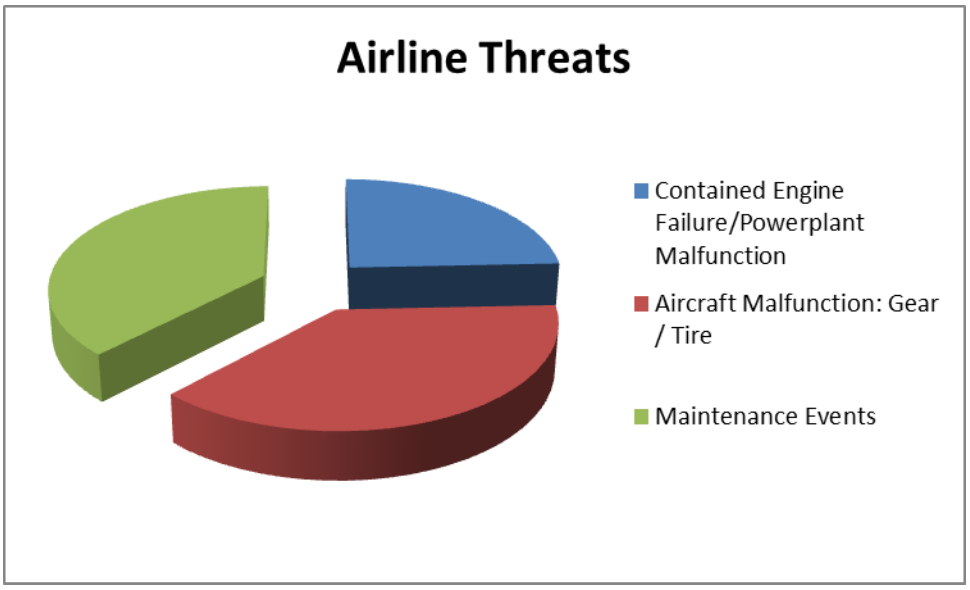


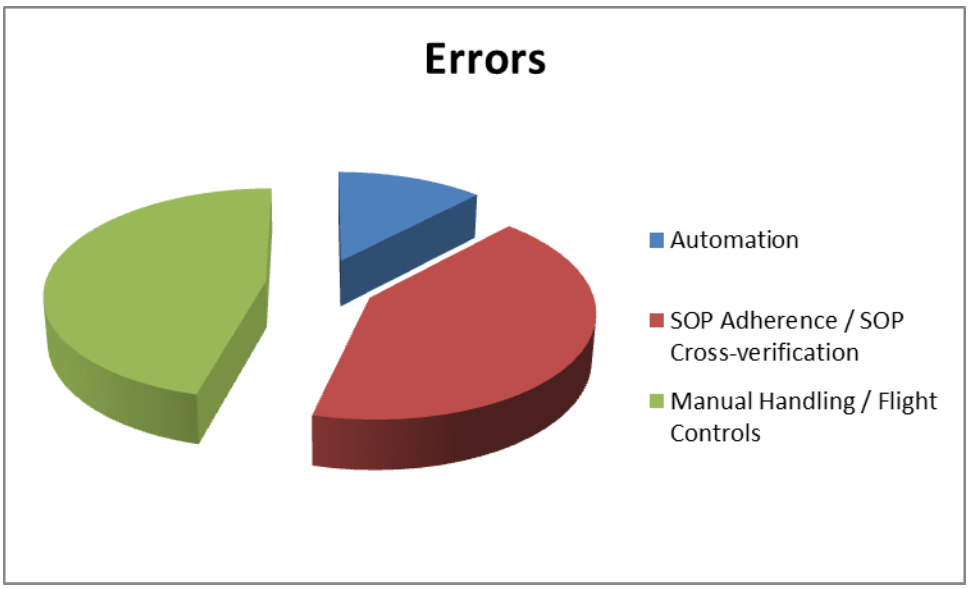


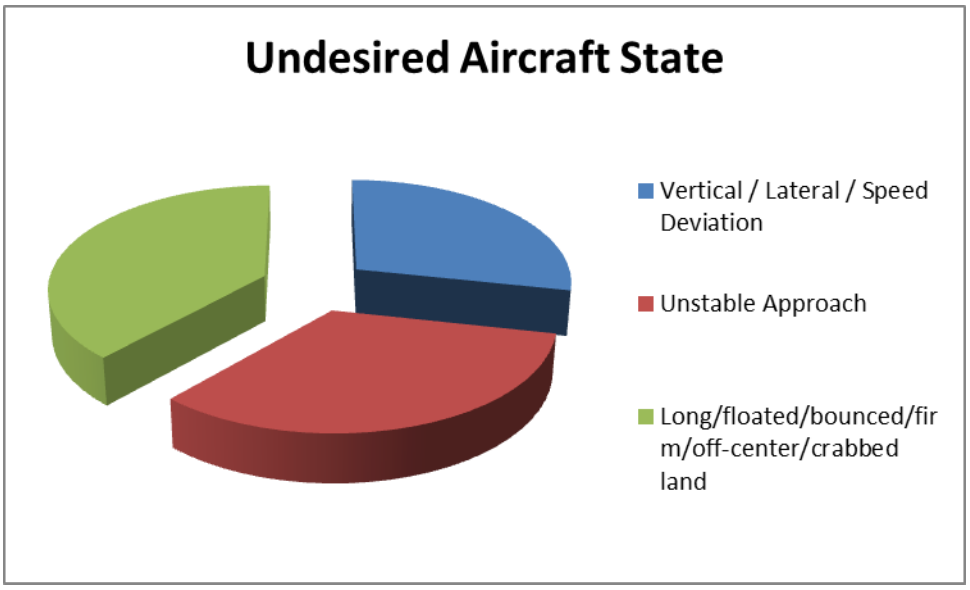
2. Top Contributing Factors for MID Accidents

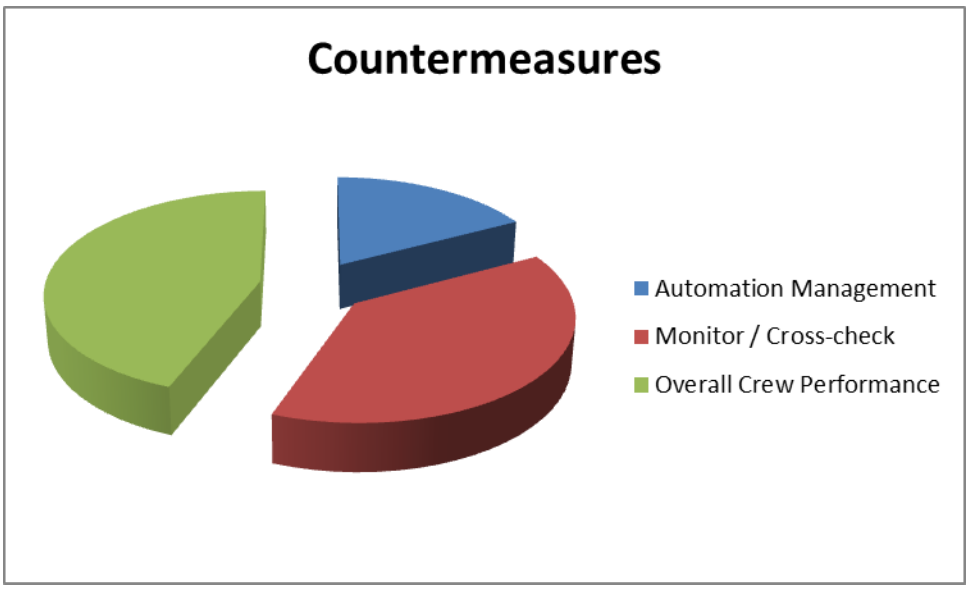



Environmental Threats
Ground-based nav aid malfunction or unavailable
Lack of Visual Reference
Wind / Windshear / Gusty wind


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

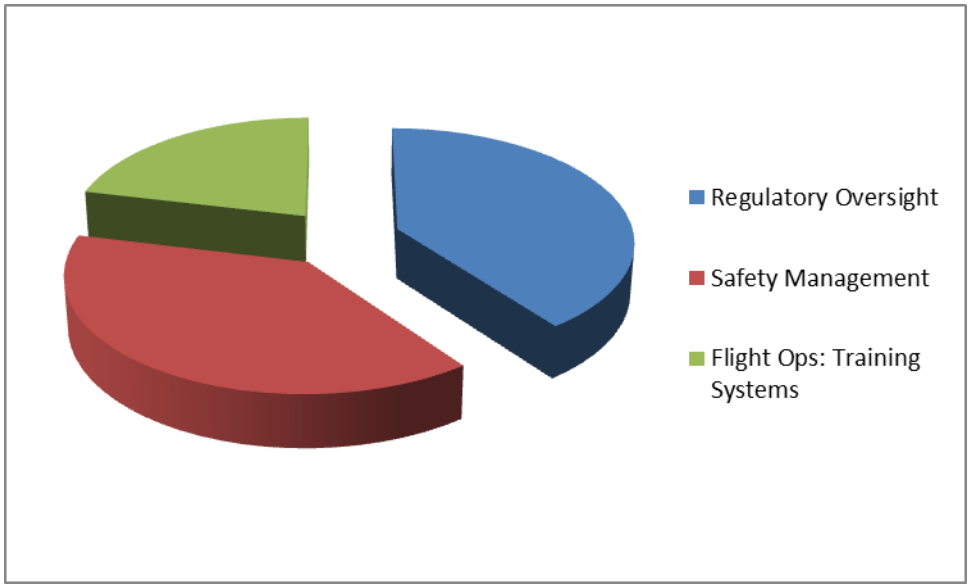

Errors
Automation
SOP Adherence / SOP Cross-verification
Manual Handling / Flight Controls


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

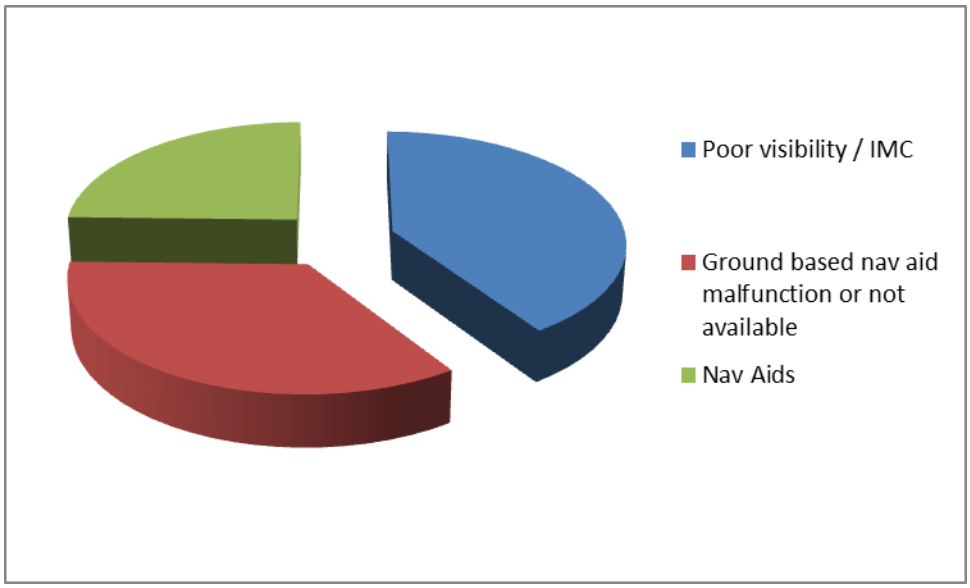


3. Top Contributing Factors for World Fatal Accidents

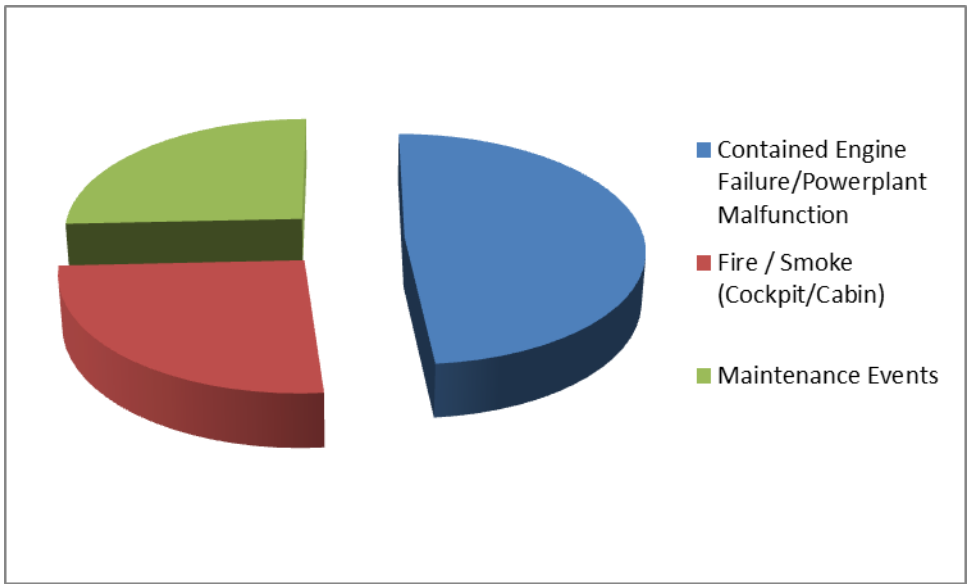
- **Latent Conditions (deficiencies in…)**



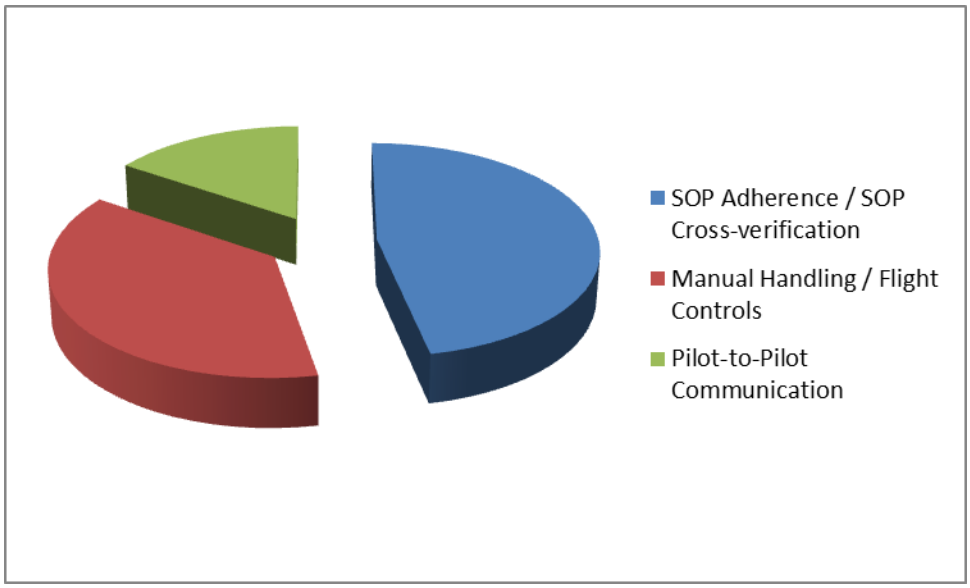
- **Environmental Threats**



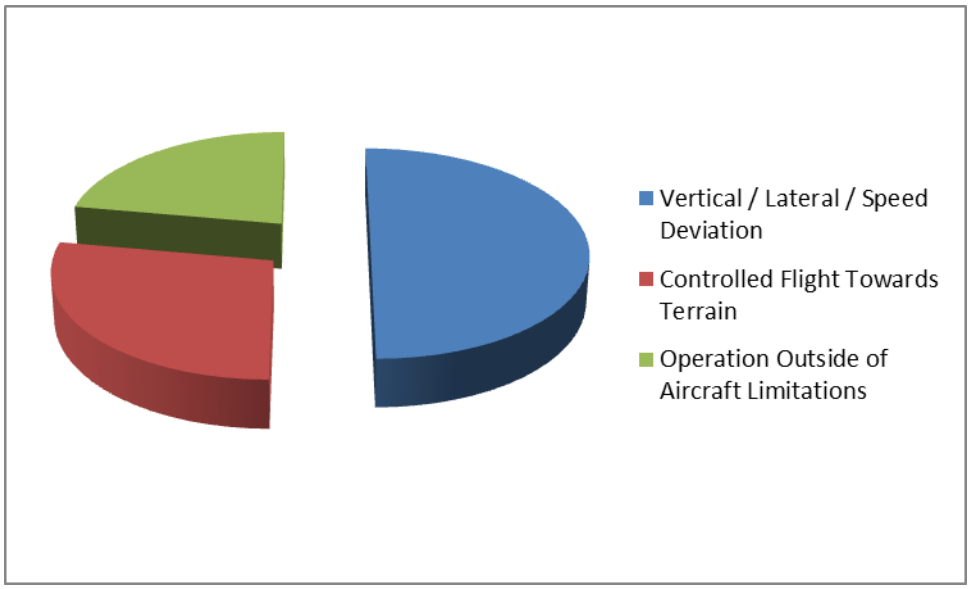
- **Airline Threats**



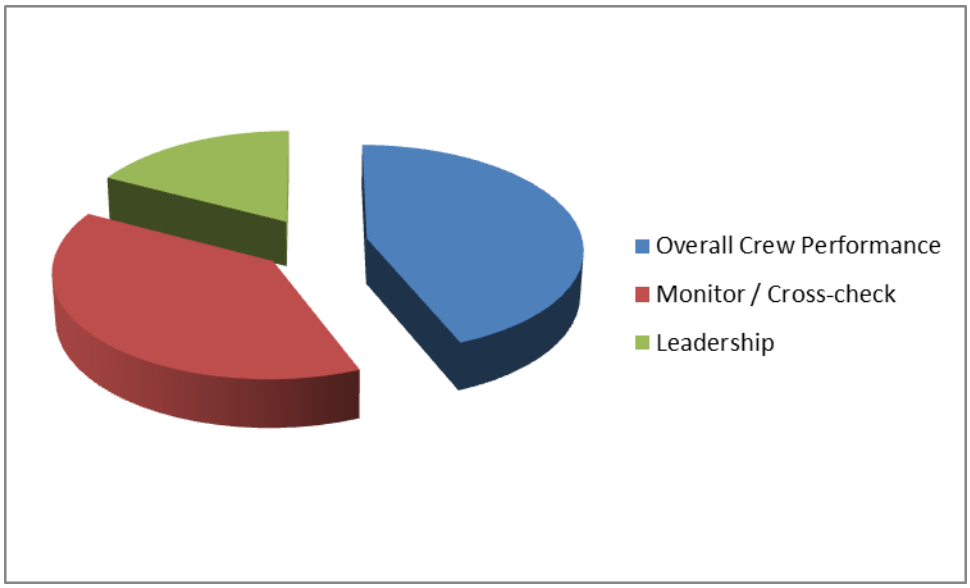
- **Errors (related to…)**



- **Undesired Aircraft States**

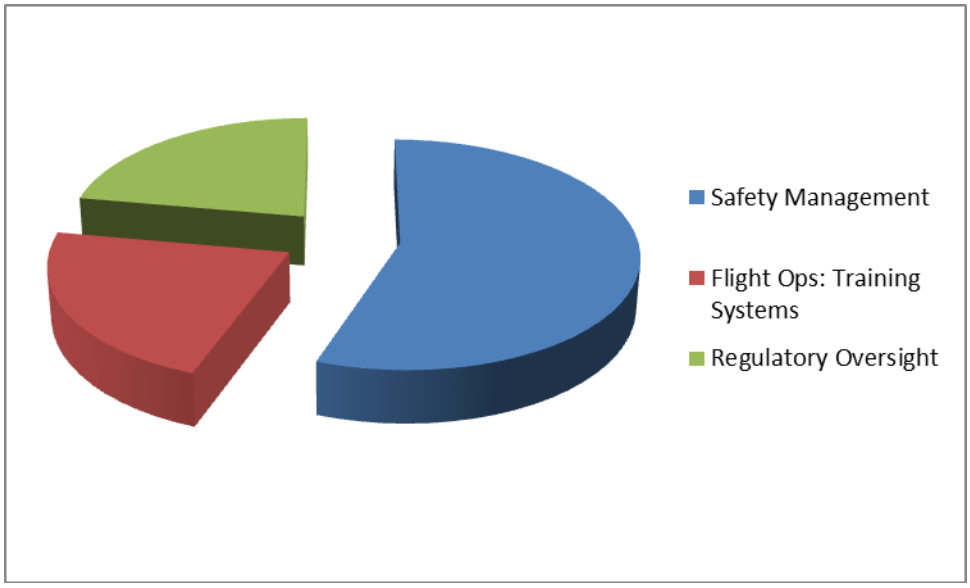


- **Countermeasures**

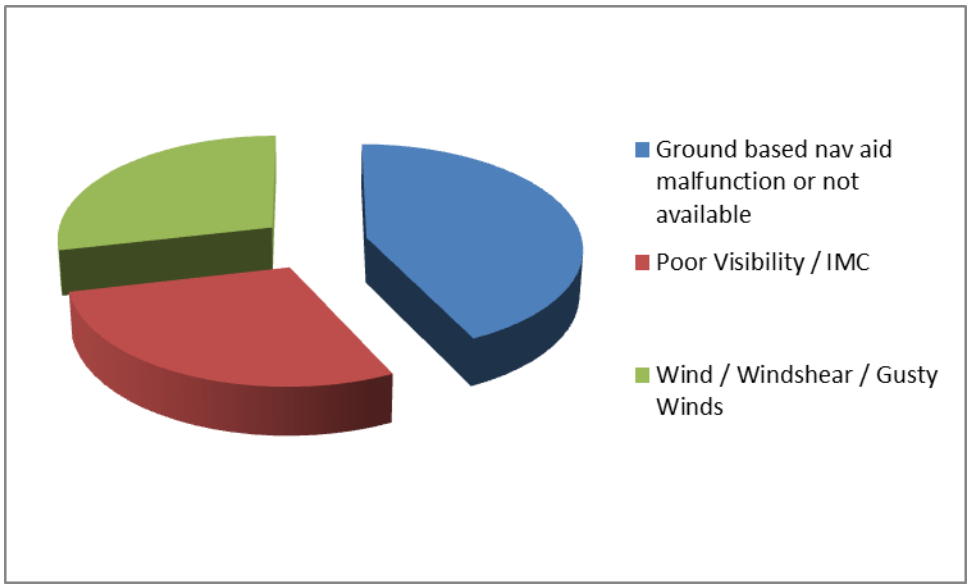


4. Top Contributing Factors for MID Fatal Accidents

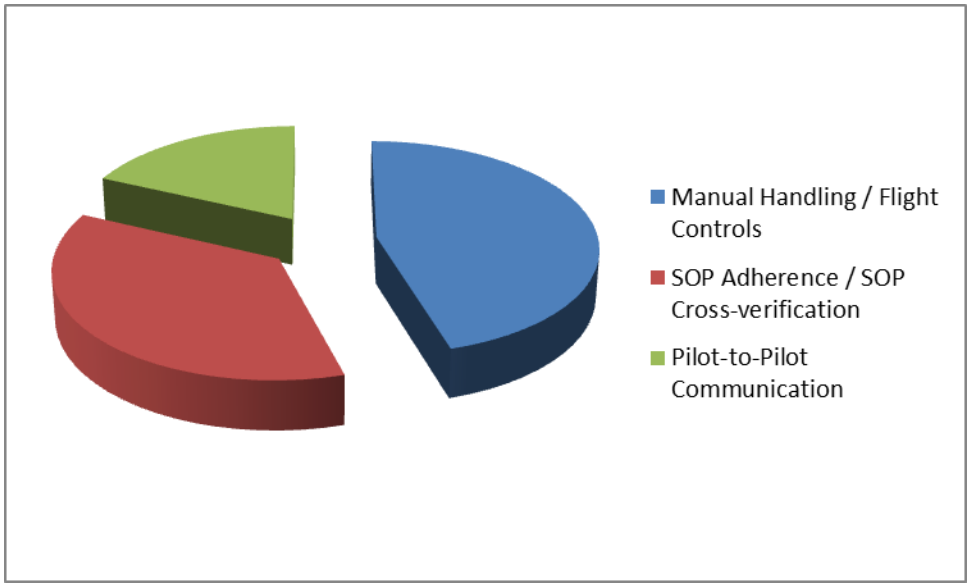
- **Latent Conditions (deficiencies in…)**



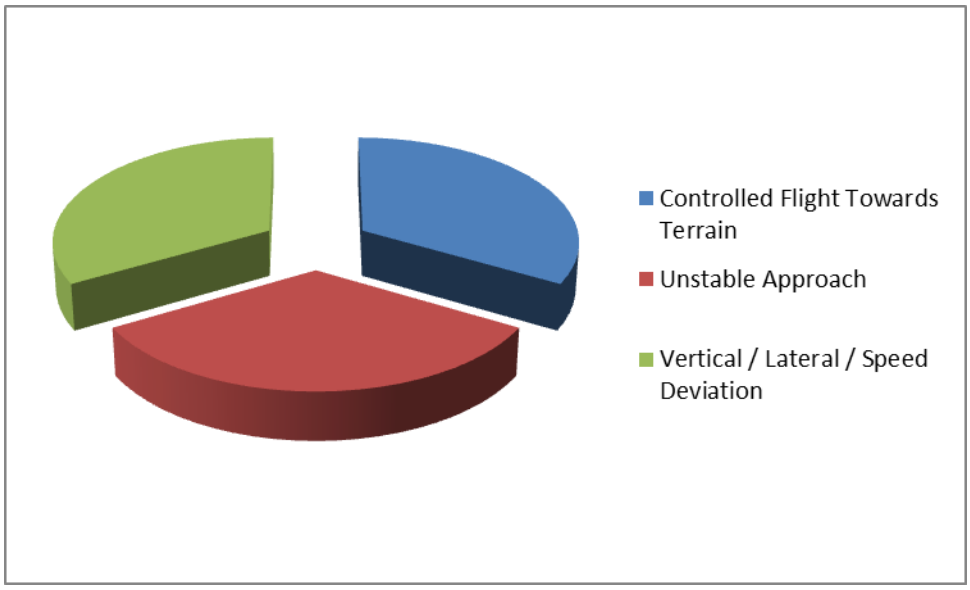
- **Environmental Threats**



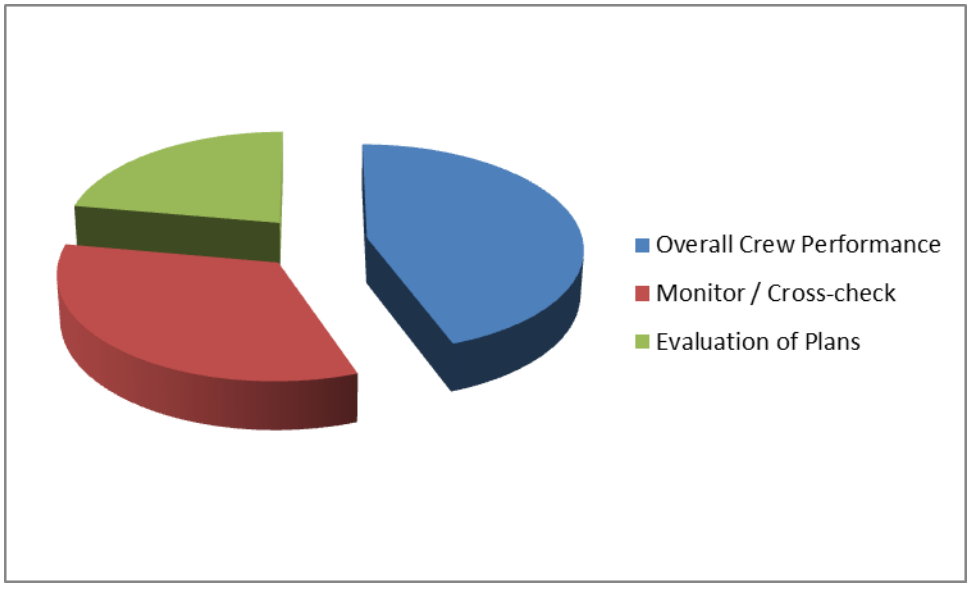
- **Errors (related to…)**



- **Undesired Aircraft State**



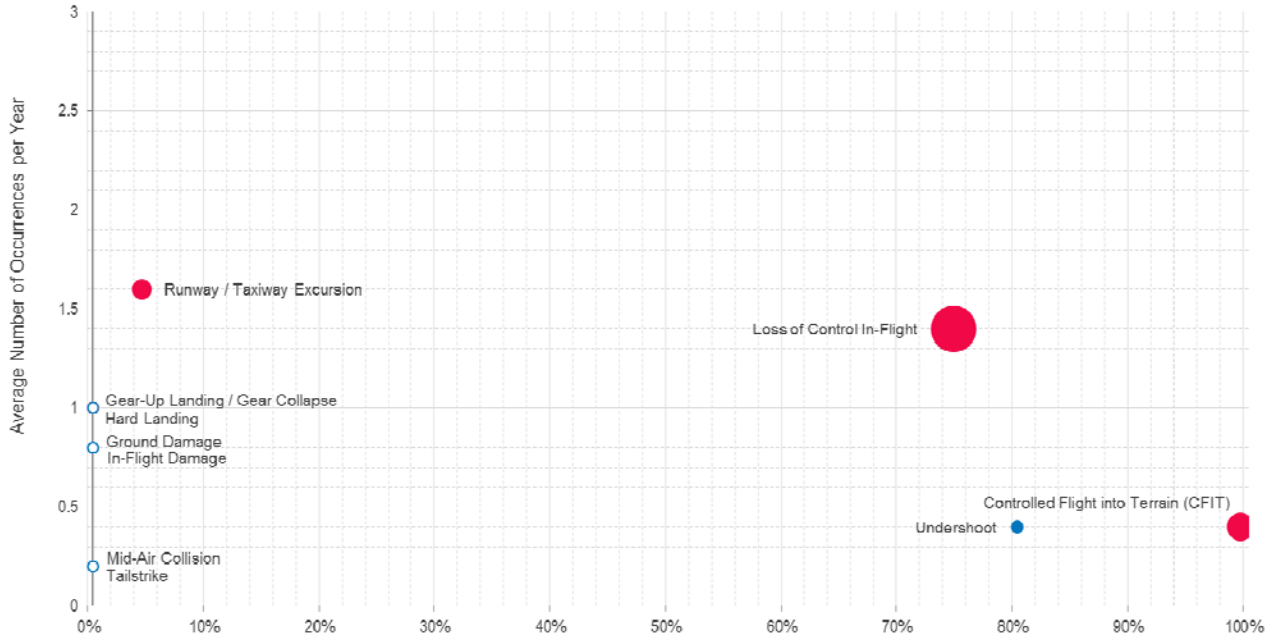
- **Counter measures**



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.

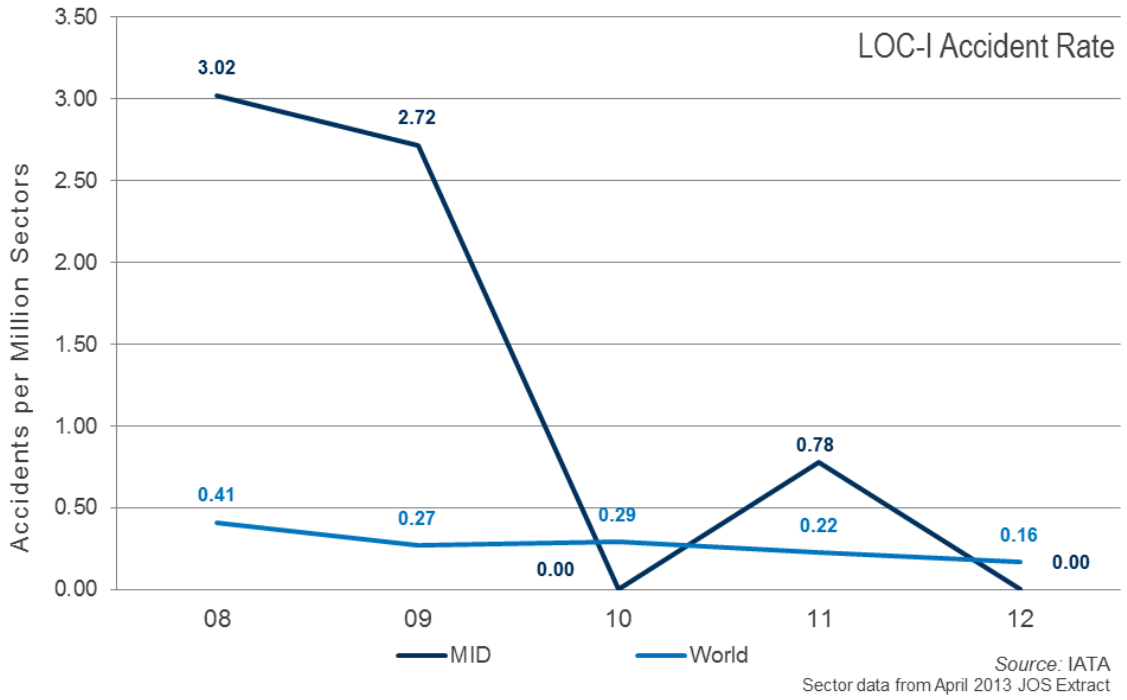
Based on this analysis, the Loss of Control In-flight, Controlled Flight Into Terrain, Runway / Taxiway Excursions and Gear-up Landing / Gear Collapse are the top risk categories of accidents. Together, these categories represent over half of the accidents from 2008 to 2012 and 93 percent of all fatalities.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



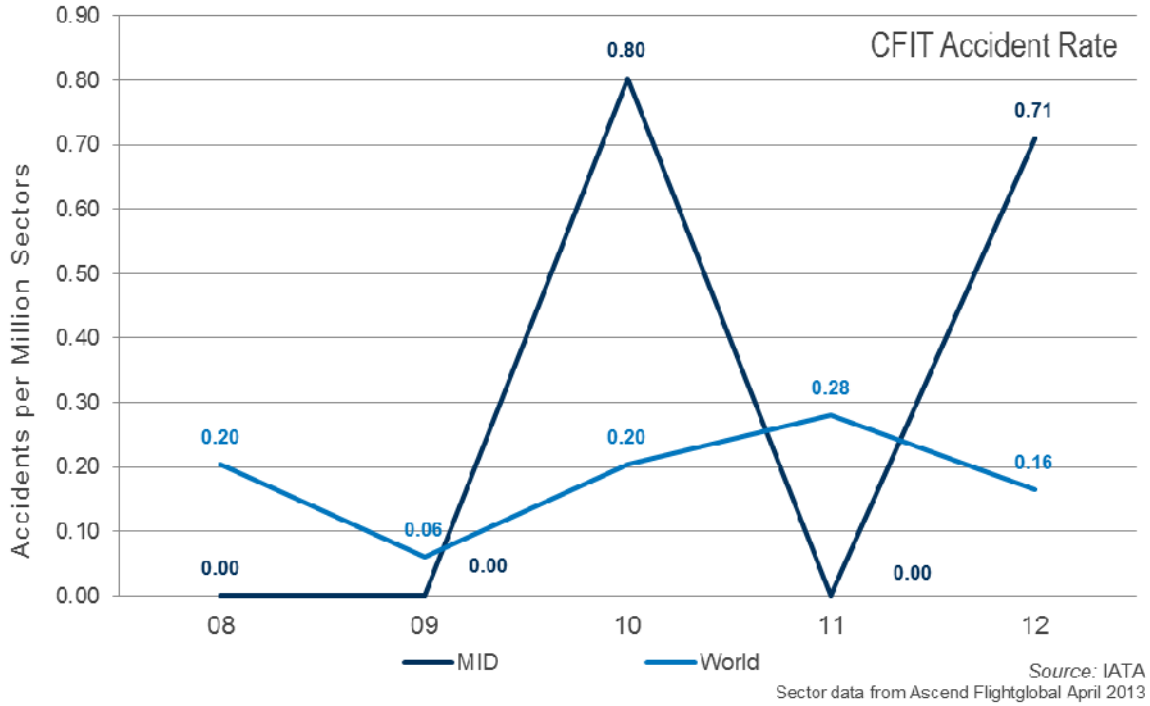
Note: Circle size increases as total fatalities increase, white indicates no fatalities.
Source: IATA

6. MID Accidents High Risk Categories

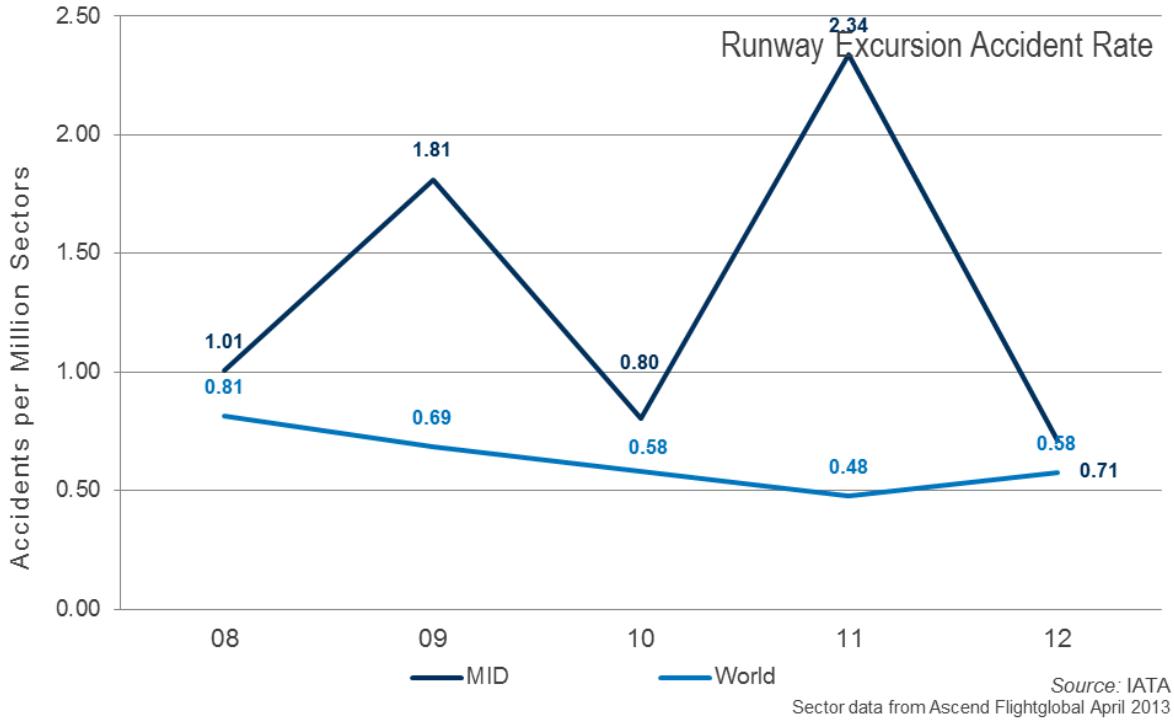
i. Loss of Control In-flight (LOC-I)



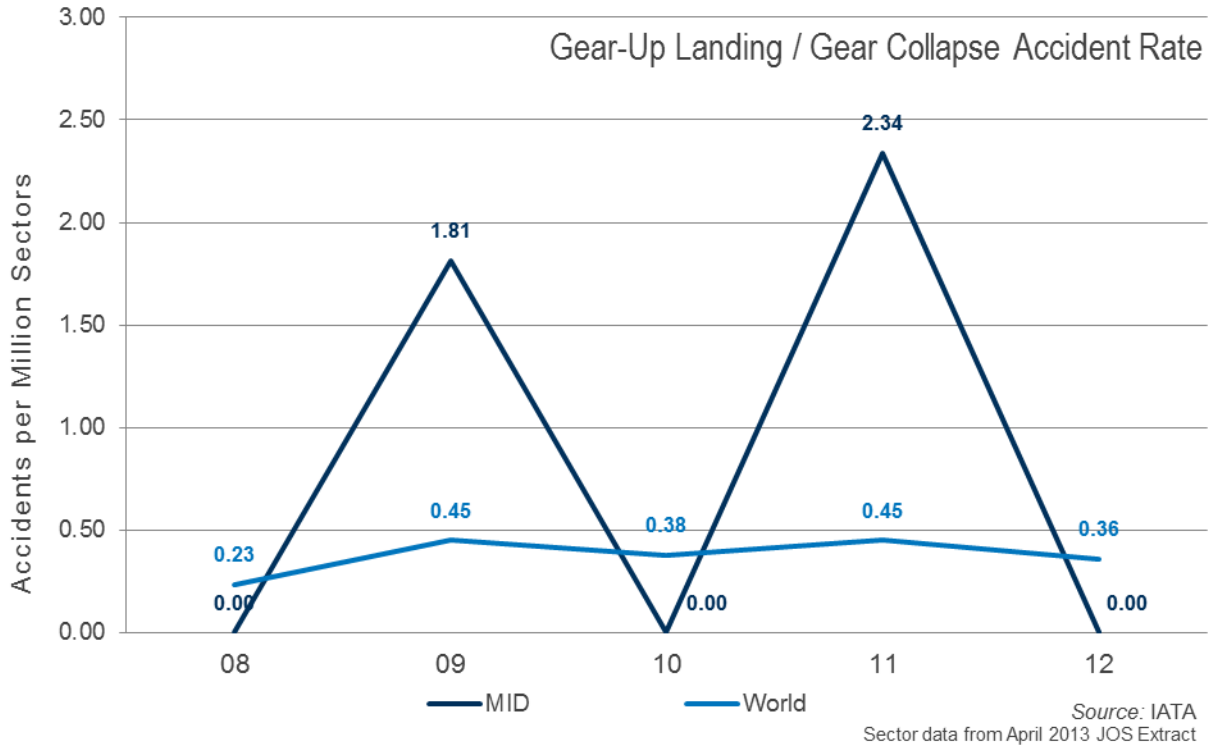
ii. Controlled Flight into Terrain (CFIT)



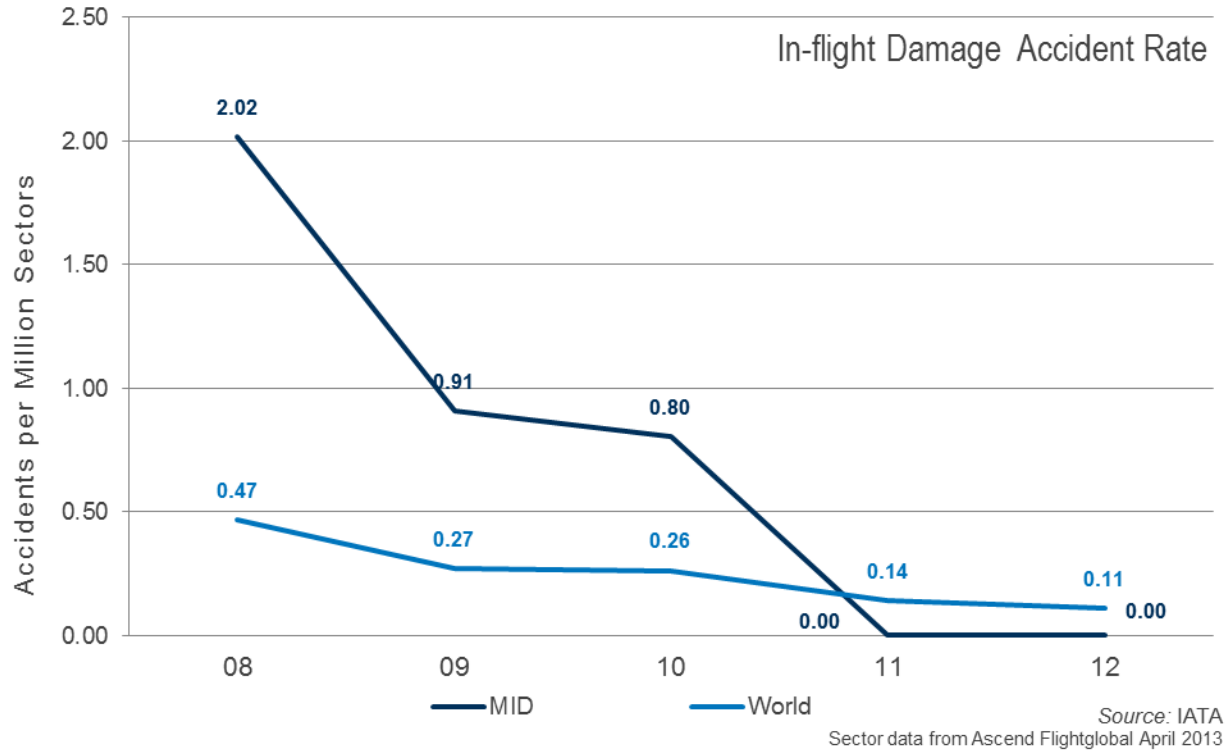
iii. Runway Excursion



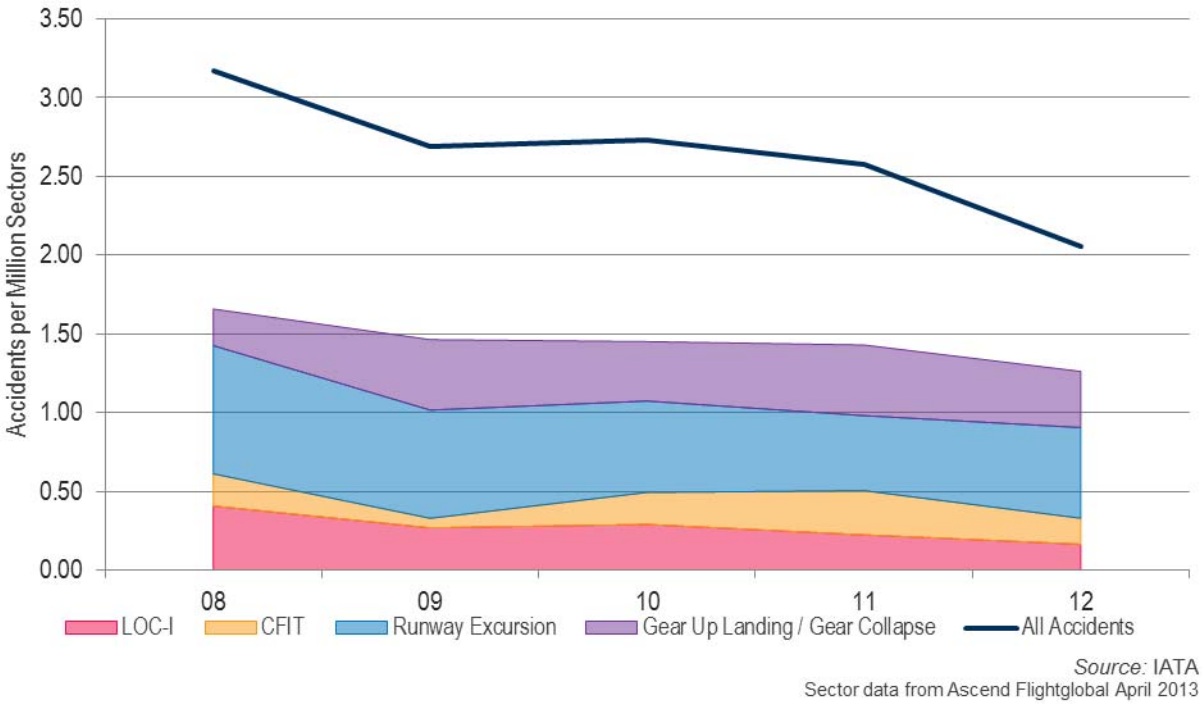
iv. Gear-Up Landing / Gear Collapse



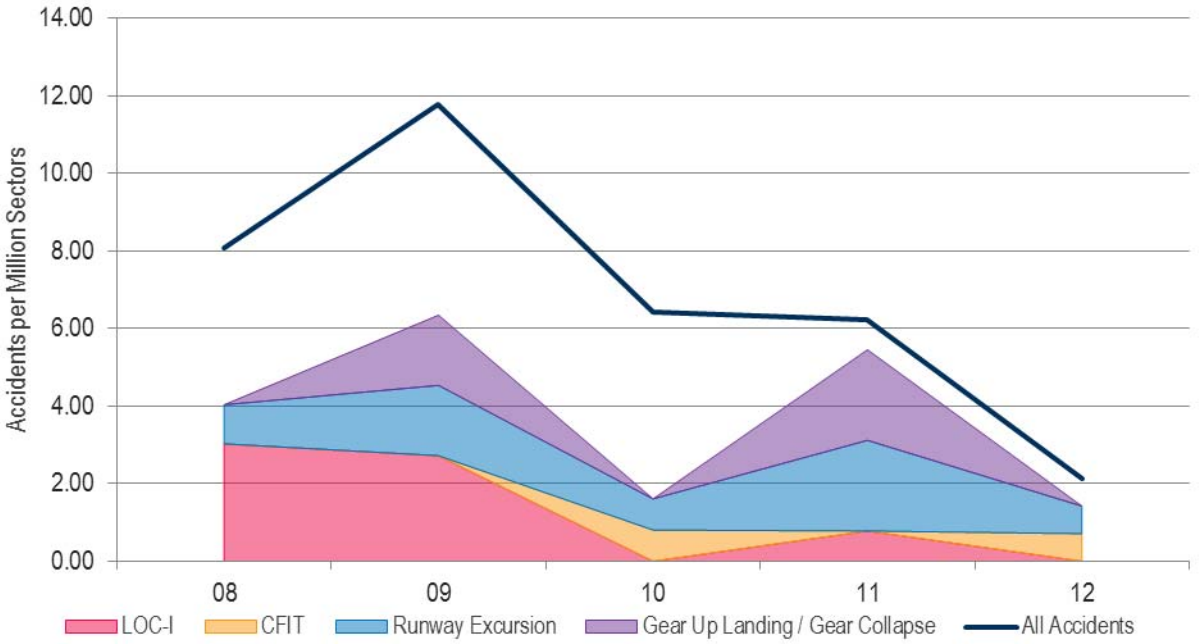
v. In-flight Damage



7. High Risk Categories – Global



8. High Risk Categories – MID Region



Source: IATA
Sector data from Ascend Flightglobal April 2013

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

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

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

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

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

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

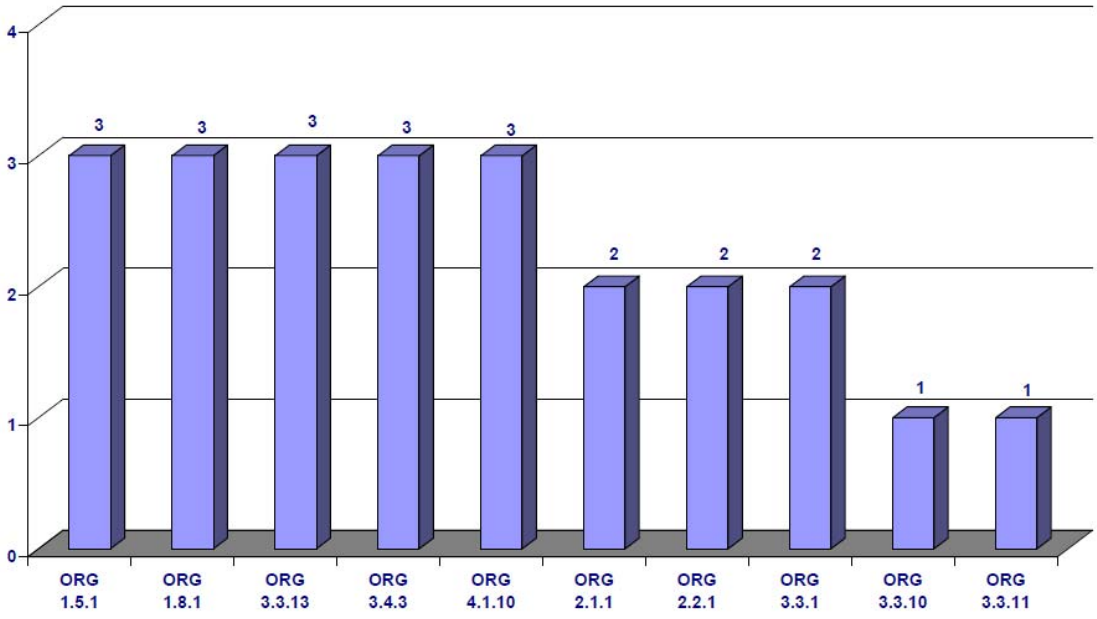
Fatal	0
Non Fatal	4

Level of Damage

Hull Loss	0
Substantial Damage	4

10. IATA Operational Safety Audit (IOSA)

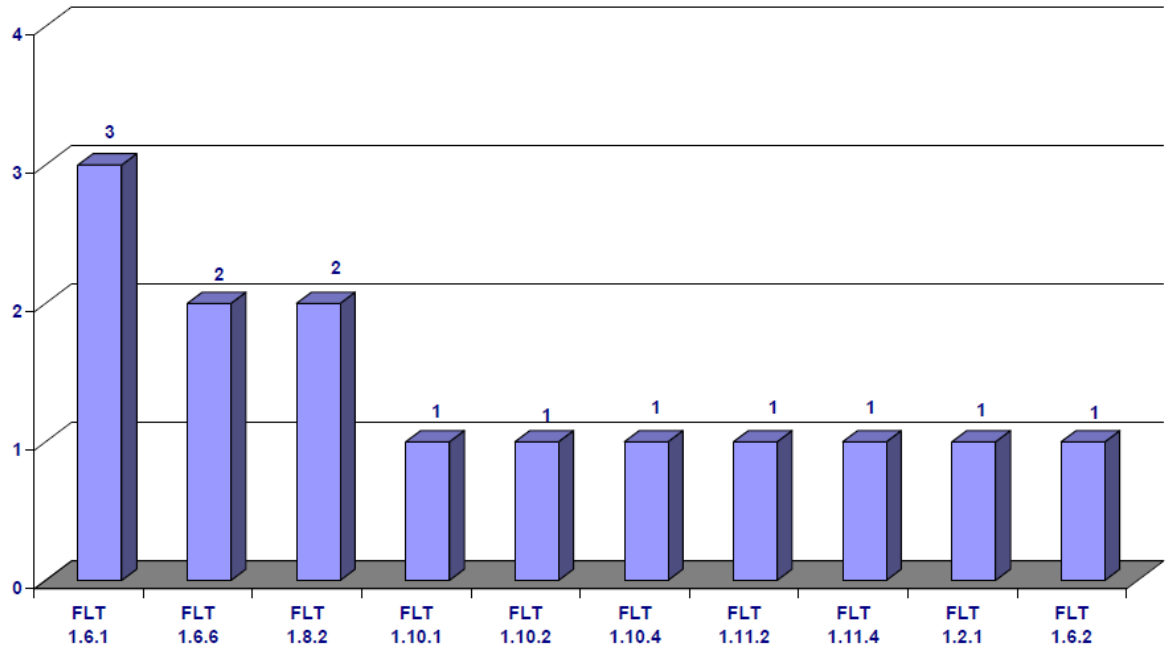
In specific and under **Organization and Management System (ORG)** the following are the main findings;



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

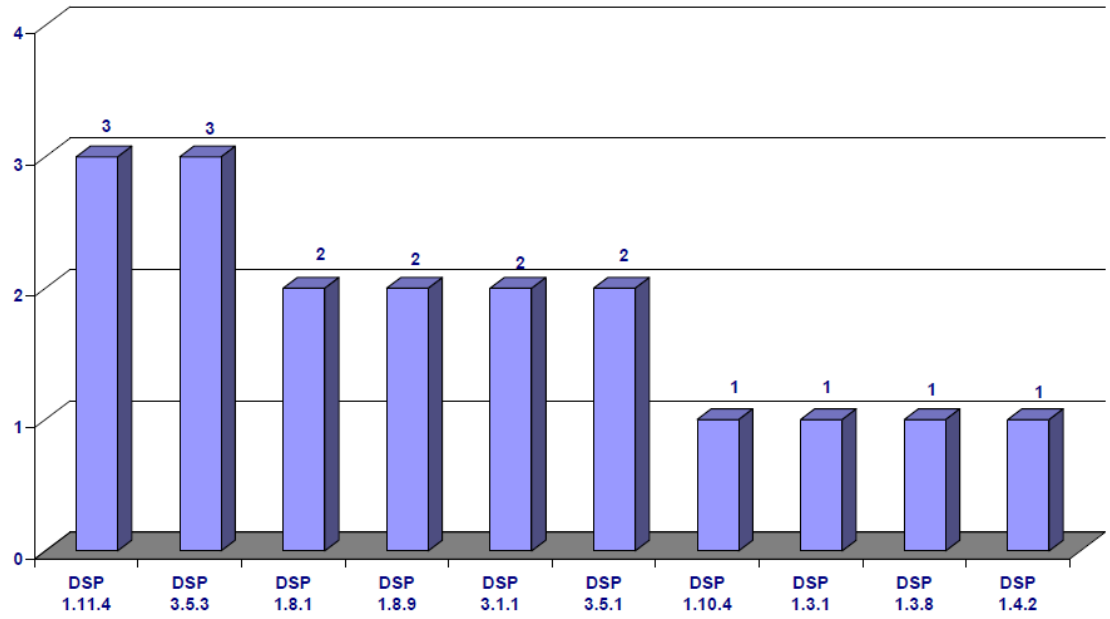
Under **Flight Operations (FLT)** the following chart indicates the main findings recorded;



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

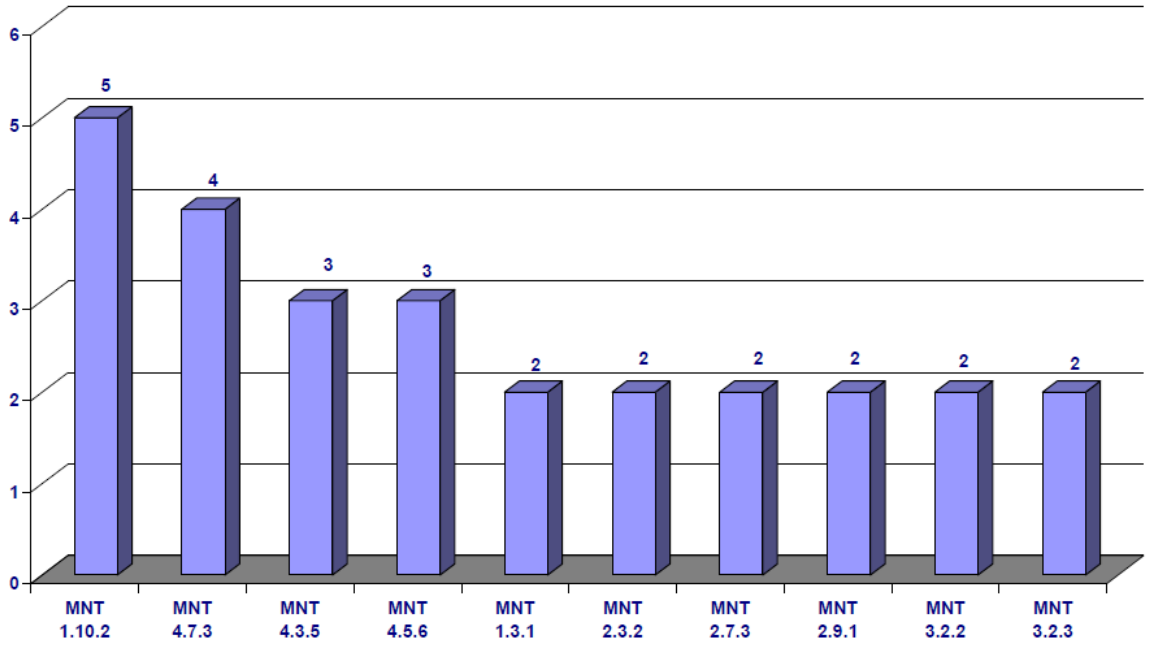
In the area of **Operational Control and Flight Dispatch (DSP)** the following findings were recorded;



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

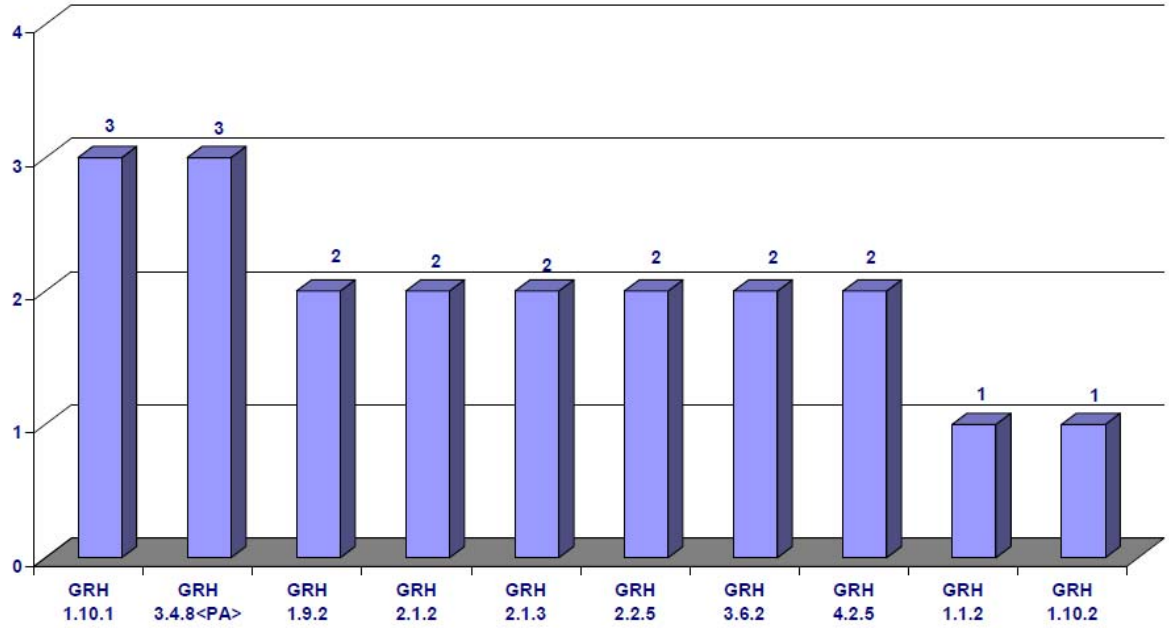
In the area of **Maintenance (MNT)** the following findings were recorded;



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

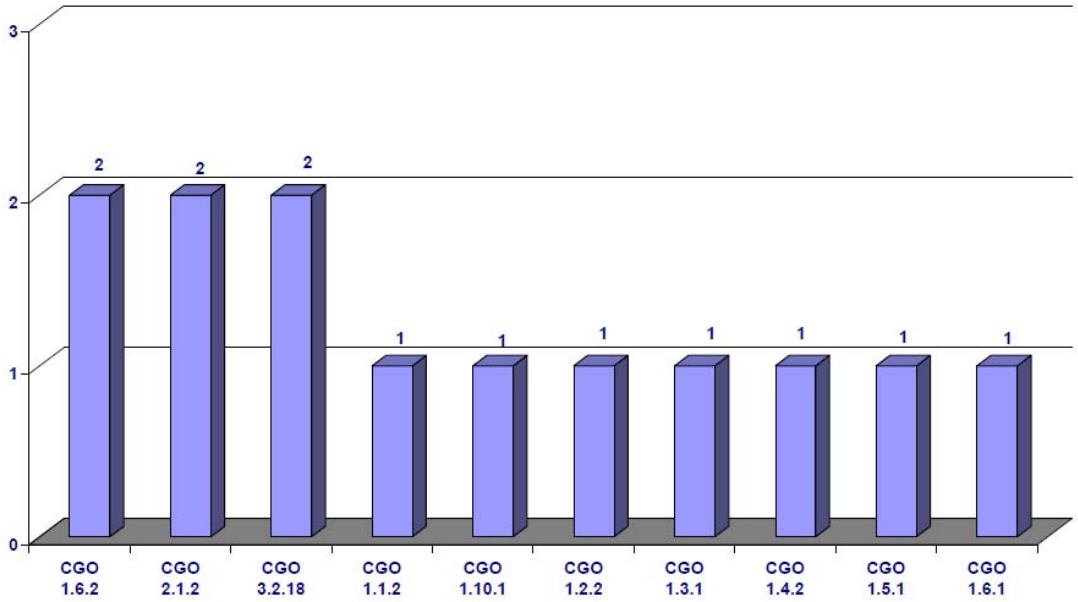
In the area of **Ground Handling (GRH)**, the following findings were recorded;



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

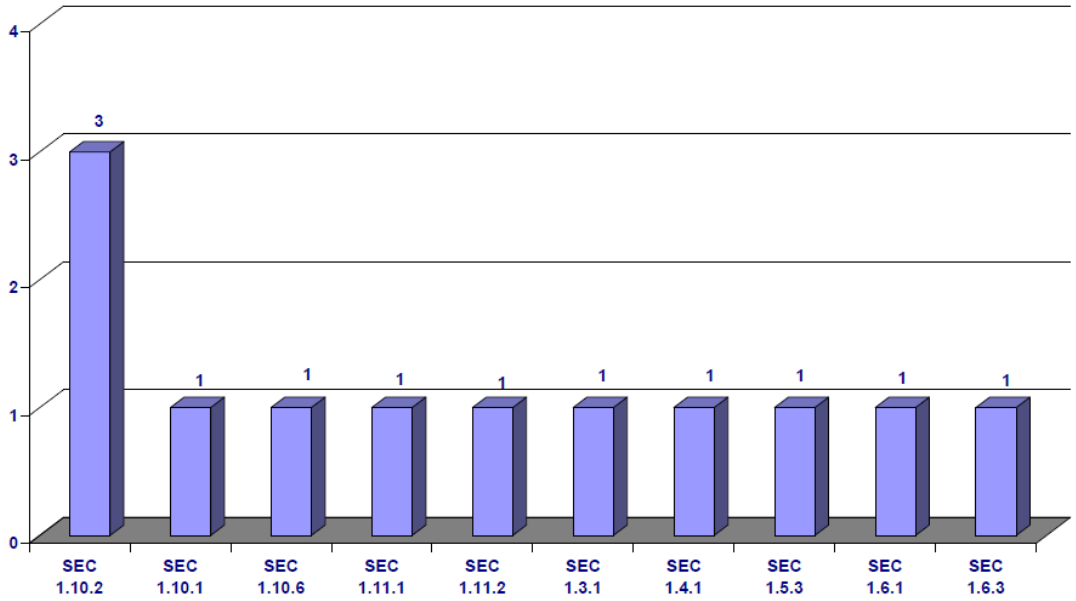
In the area of **Cargo Operations (CGO)**, the following findings were recorded;



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;

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.

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

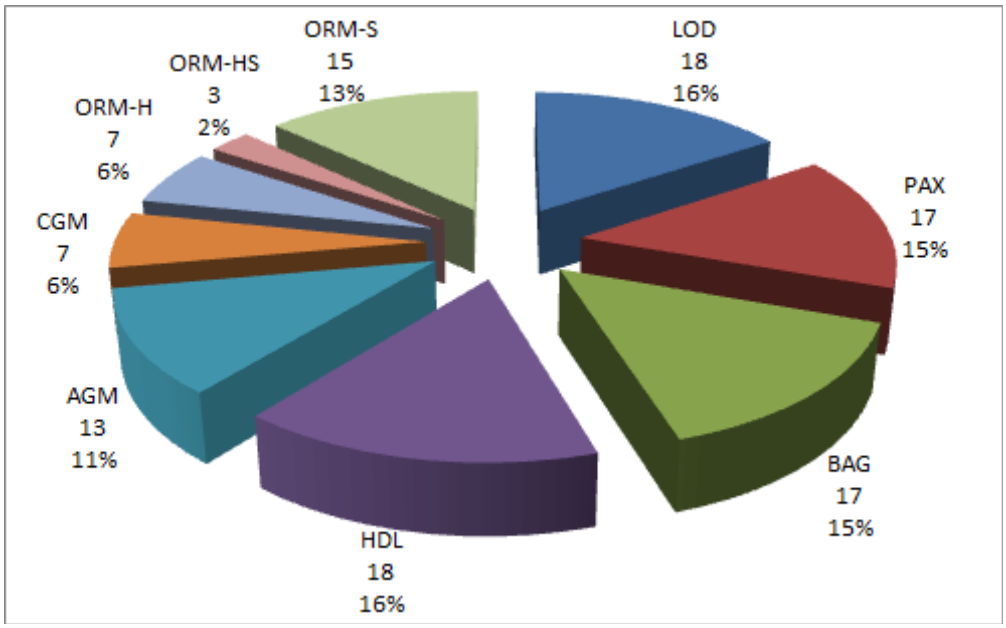
11. IATA Safety Audit for Ground Operations (ISAGO)

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

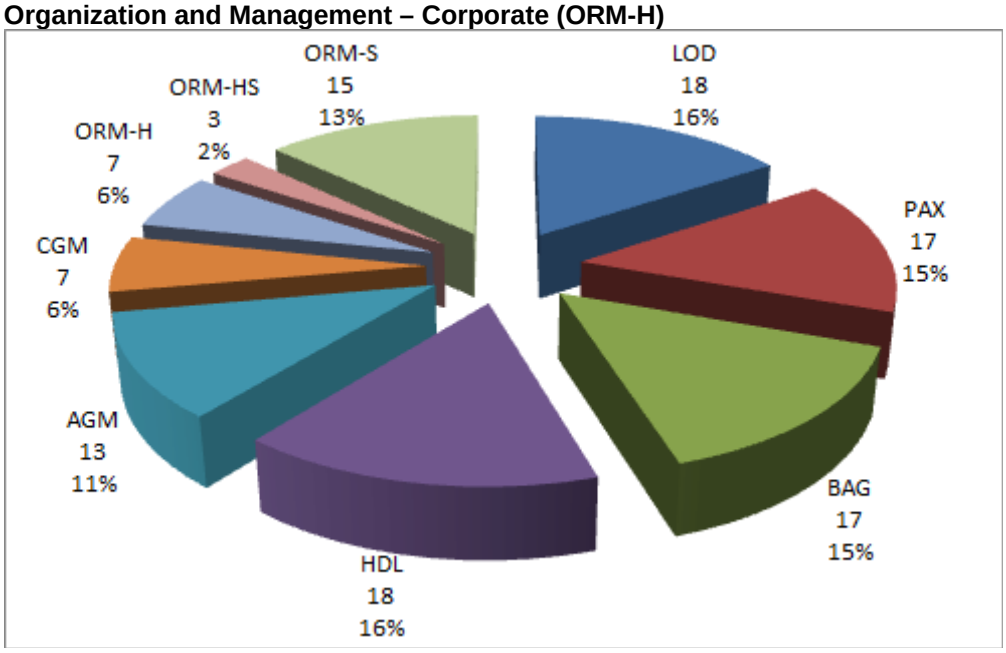
A total of 131 audit reports (36 corporate, 28 combined and 67 station) have been included in the analysis covering all 8 IATA regions. The 131 audits resulted in 213 findings coming from corporate audits, 579 findings coming from station audits and 546 findings coming from combined audits.

Distribution of Findings for MENA:

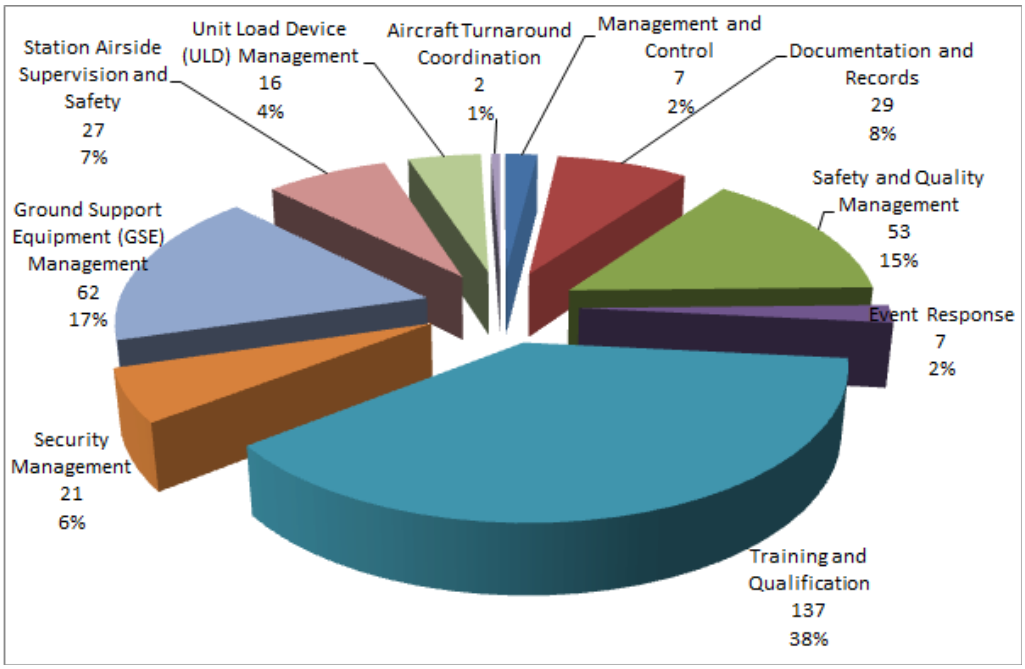
Overall Disciplines



Organization and Management – Corporate (ORM-H)



Organization and Management – Outstations (ORM-S)

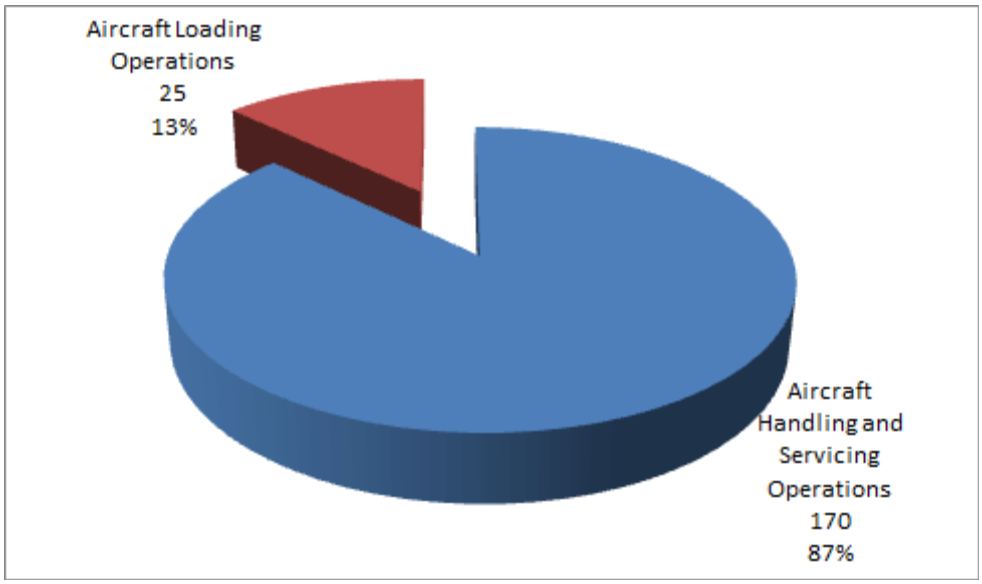


Load Control (LOD)

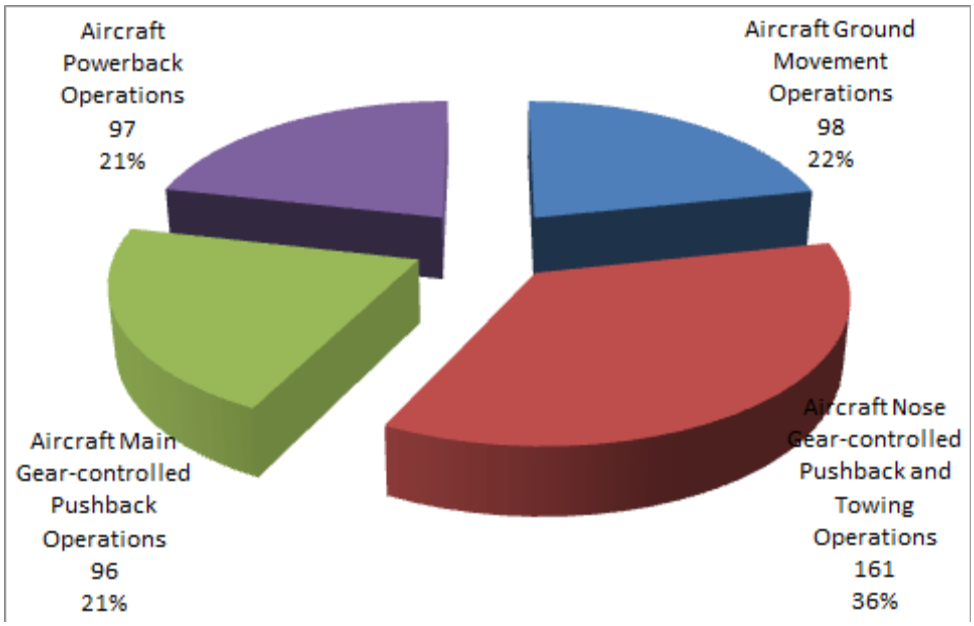
The top finding under LOD is related to load sheet completion;

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).

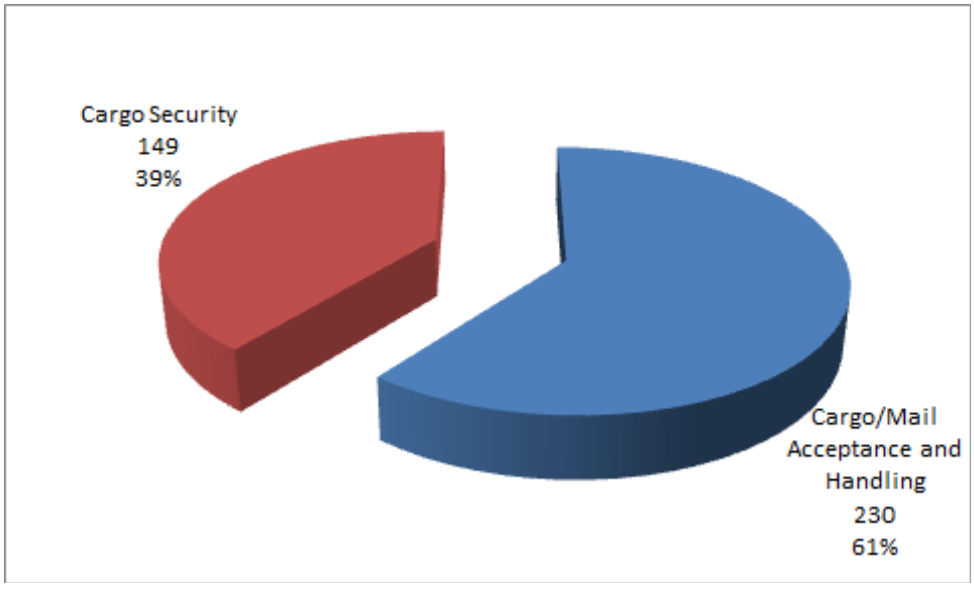
Aircraft Handling and Loading (HDL)



Aircraft Ground Movement (AGM)



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.

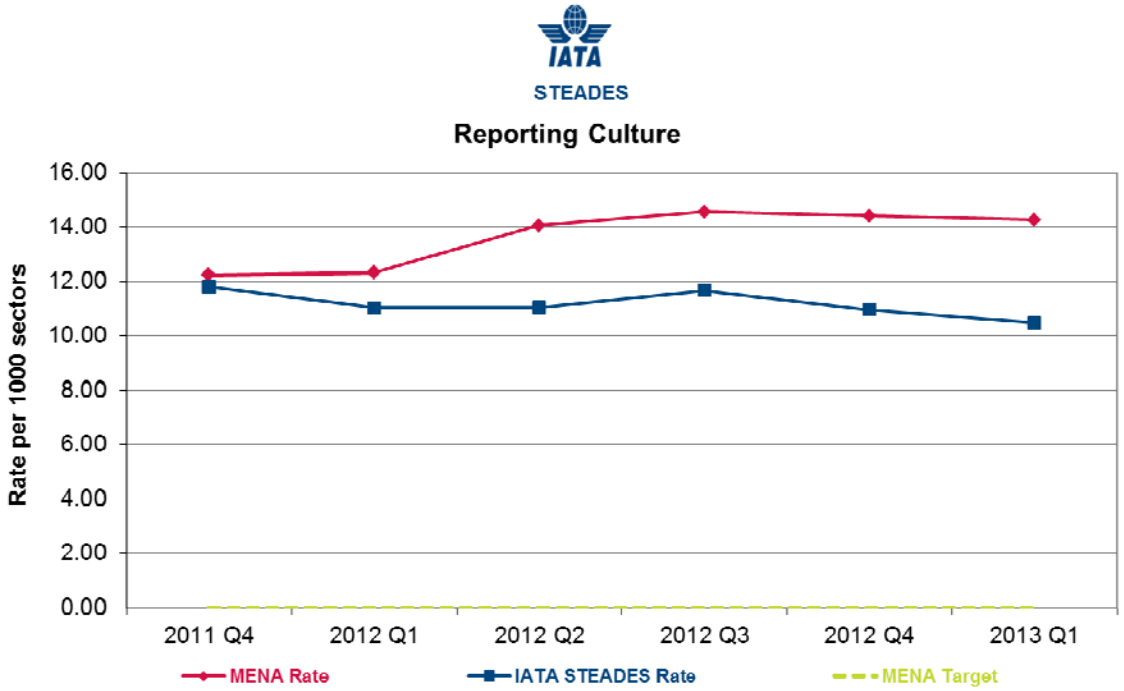
  Top 10 findings are related to passengers boarding bridge handling and usage and aircraft/apron security.

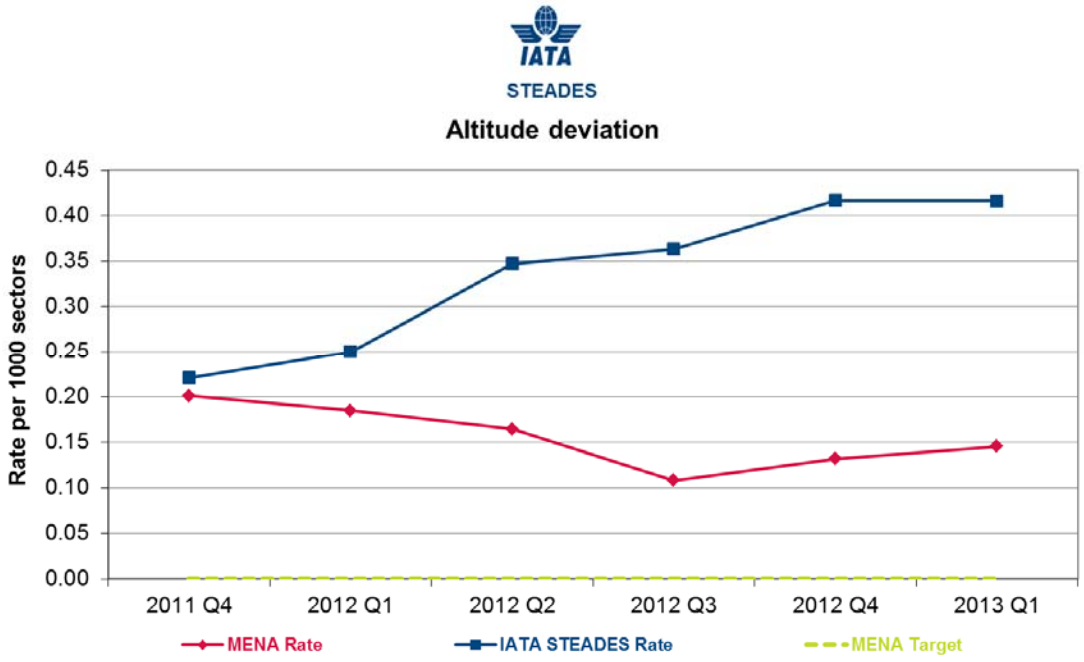
12. STEADES data

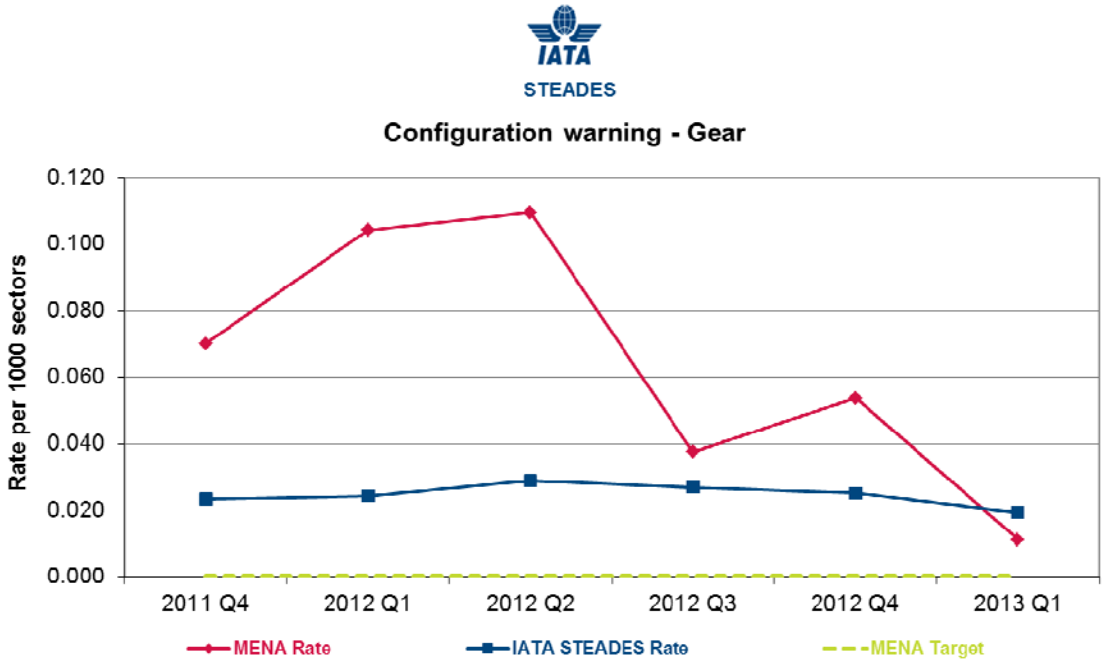
The Safety Trend Evaluation, Analysis & Data Exchange System (STEADES) is IATA's aviation safety incident data management and analysis program. It is a database of de-identified airline incident reports. Safety trend analysis using STEADES is included in this report allows proactive safety mitigation,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

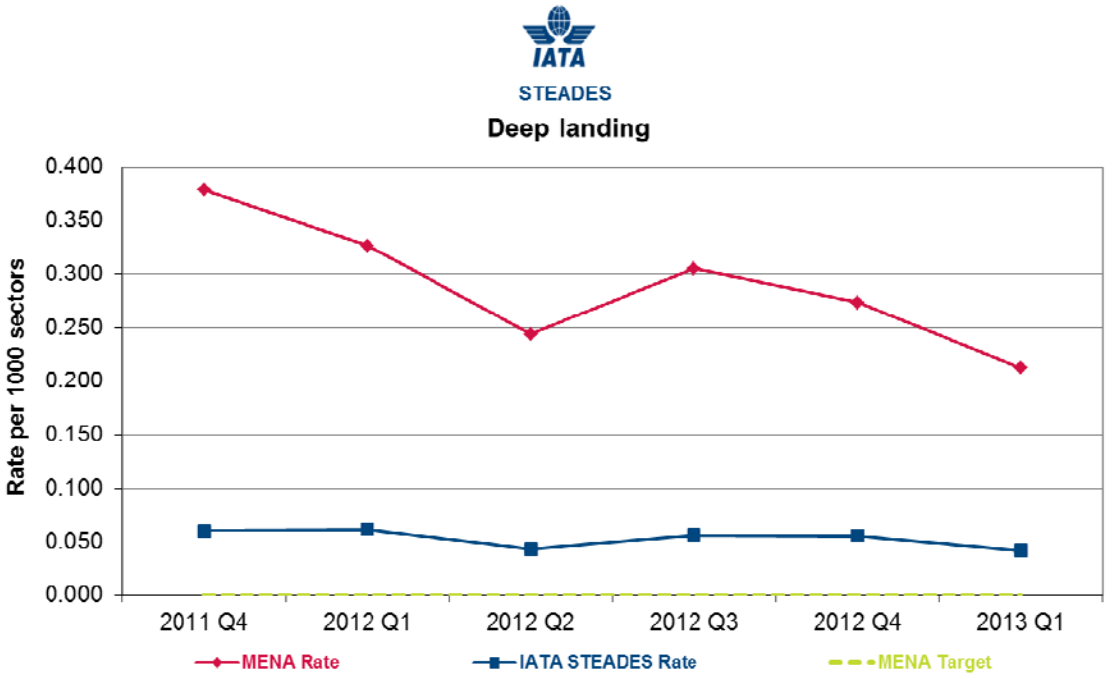
The scope of analysis captured in this report covers the period Q4 2011 to Q1 2013.

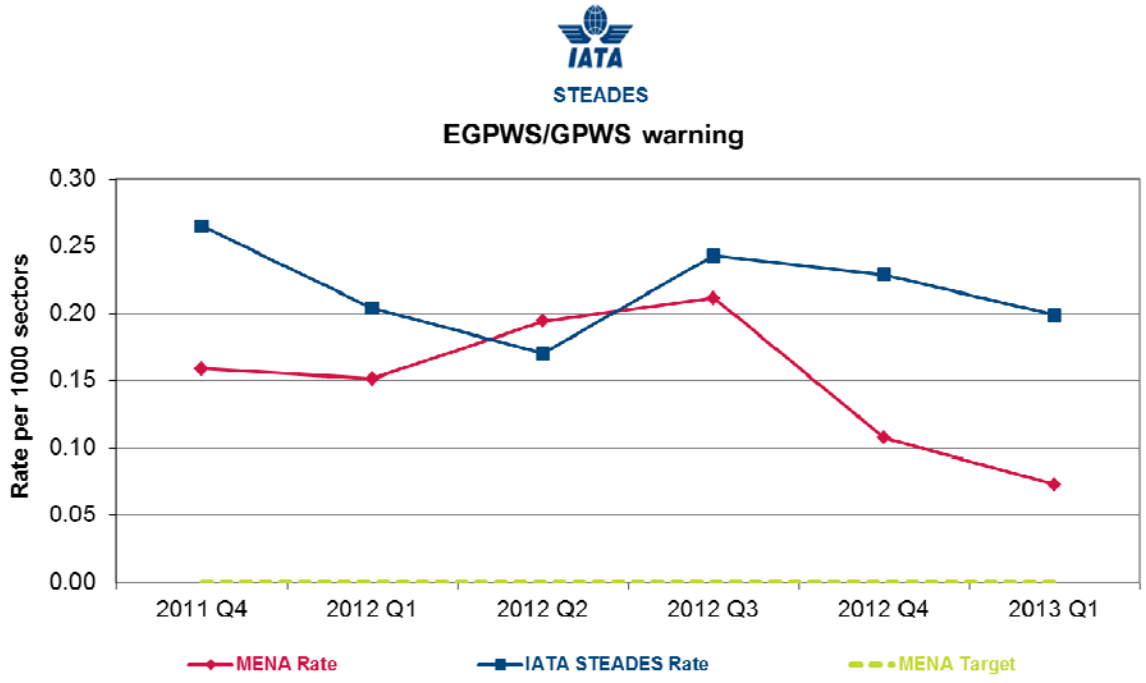
STEADES: Submitted reports	161,172
STEADES: Total Flights	14,436,436
% of total world flights	26.3%
MENA: Submitted reports	22,653
MENA: Total flights	1,222,283
% of STEADES' flights	8.5%

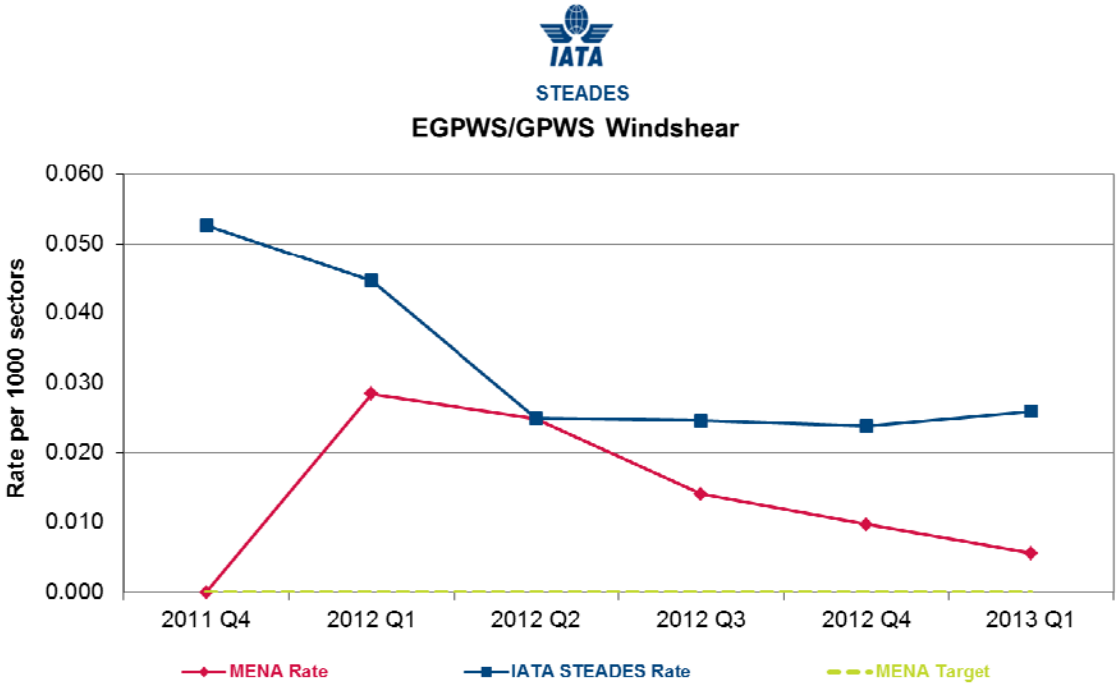






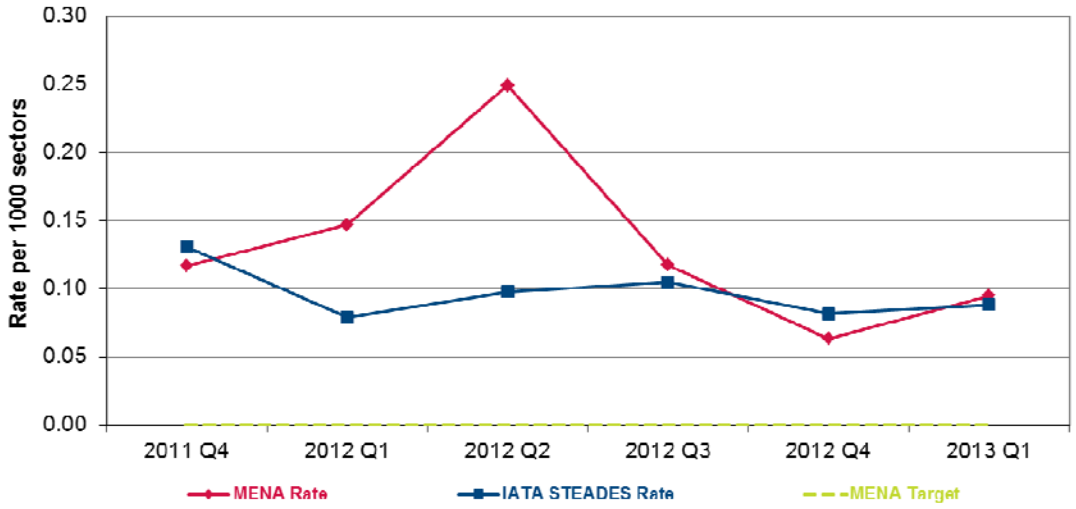






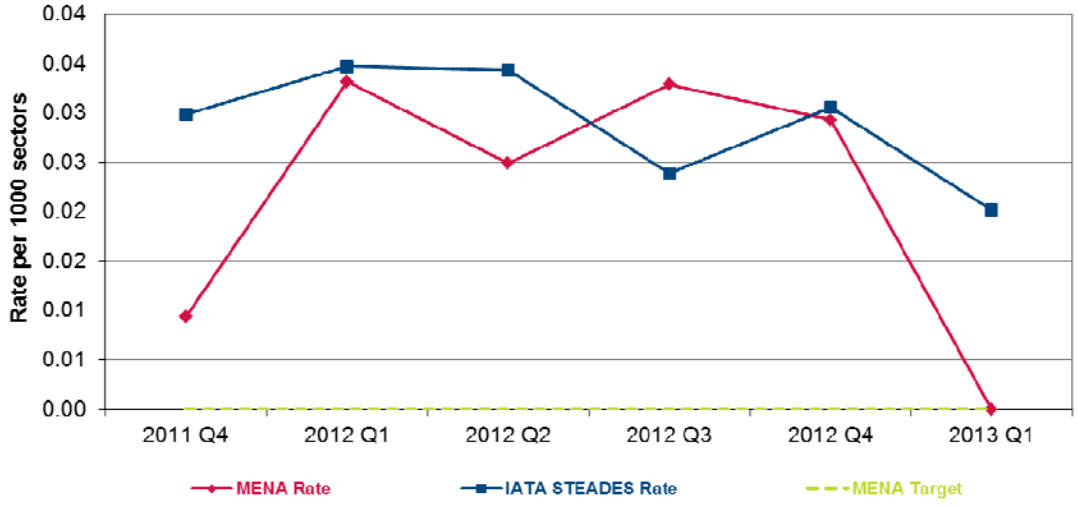
STEADES

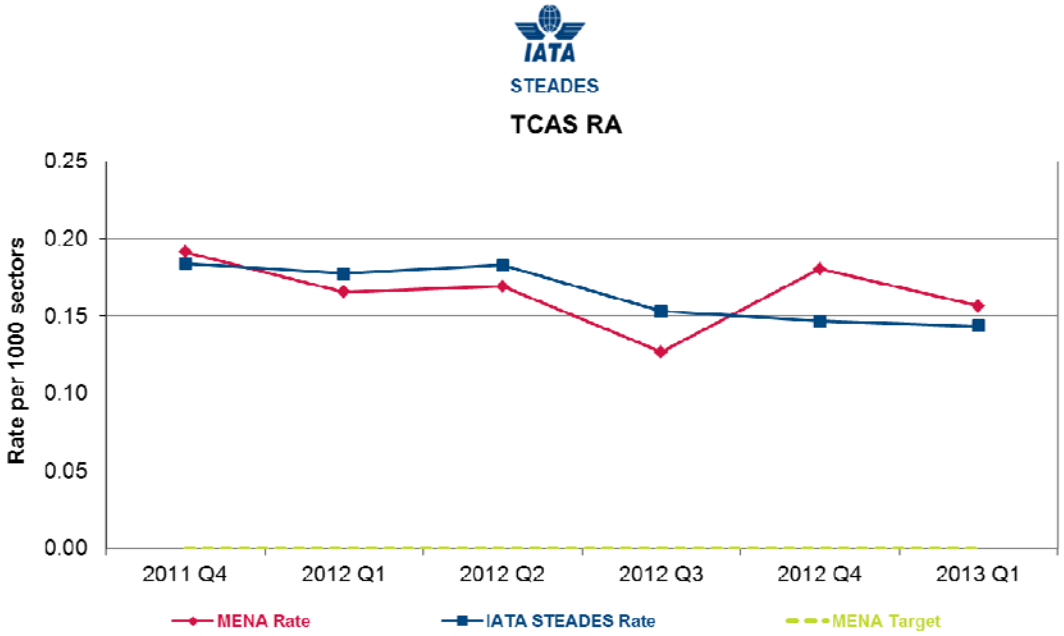
Hard/heavy landing

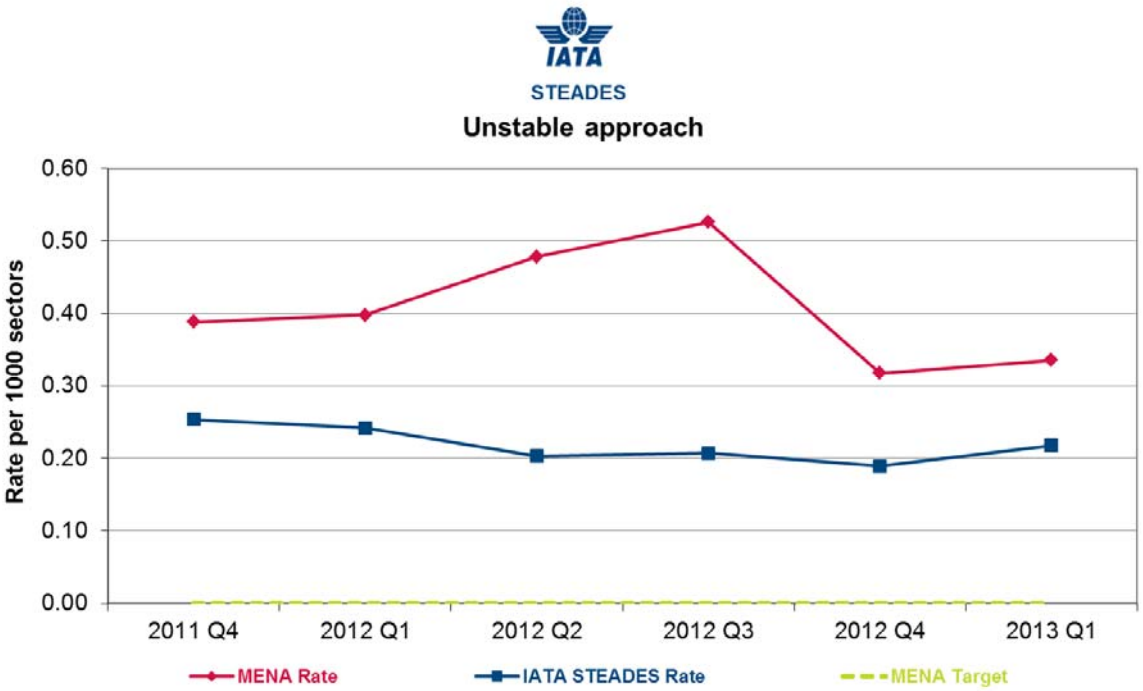


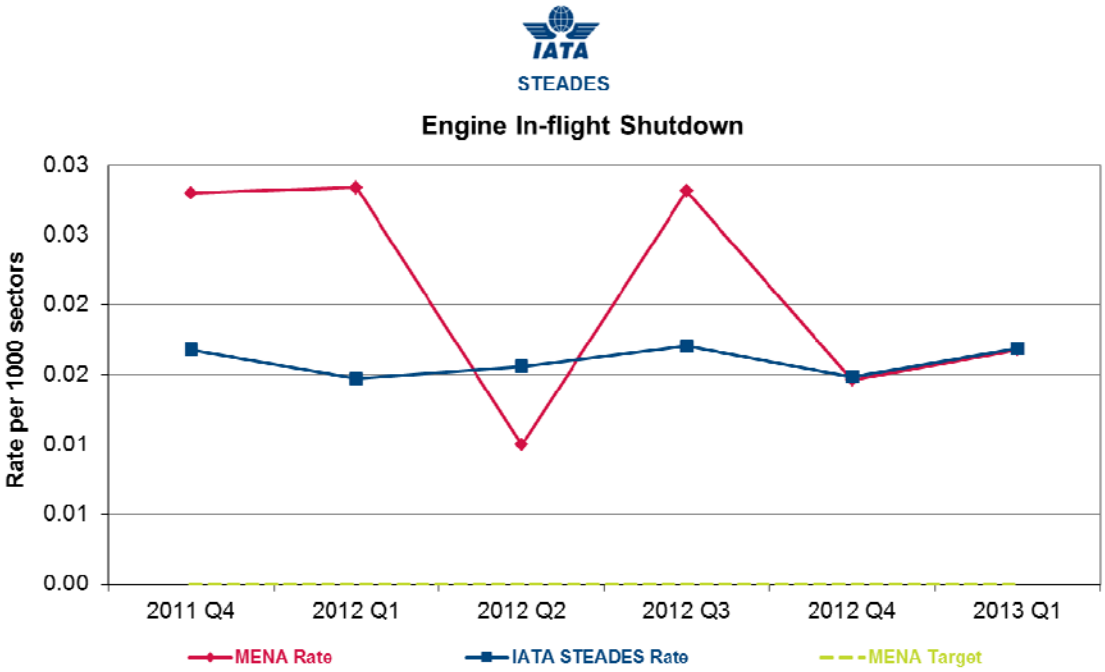
STEADES

Stall warning





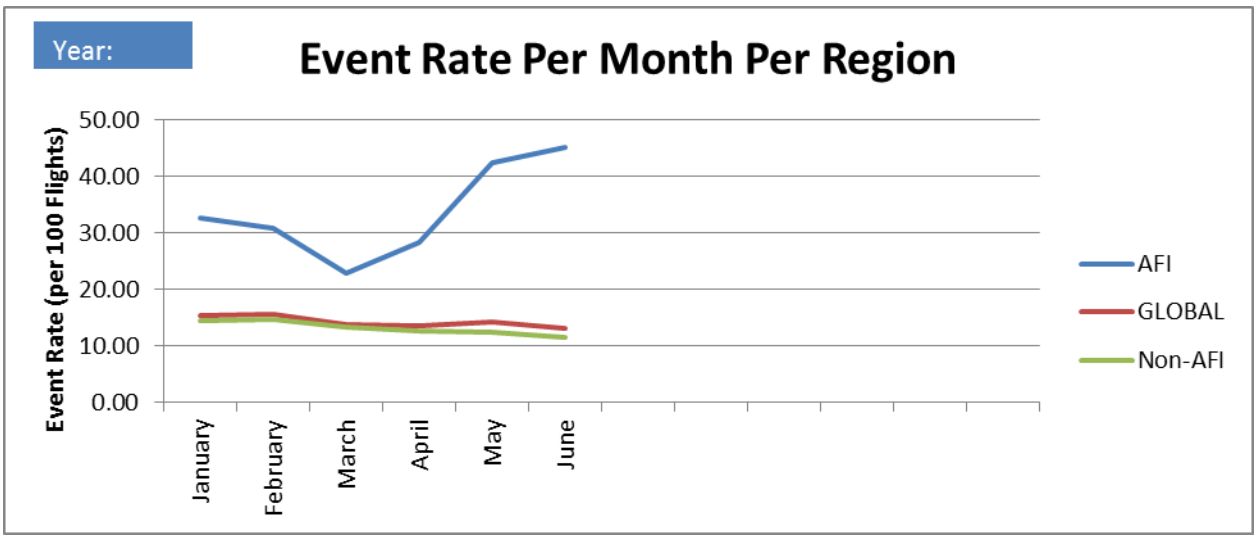


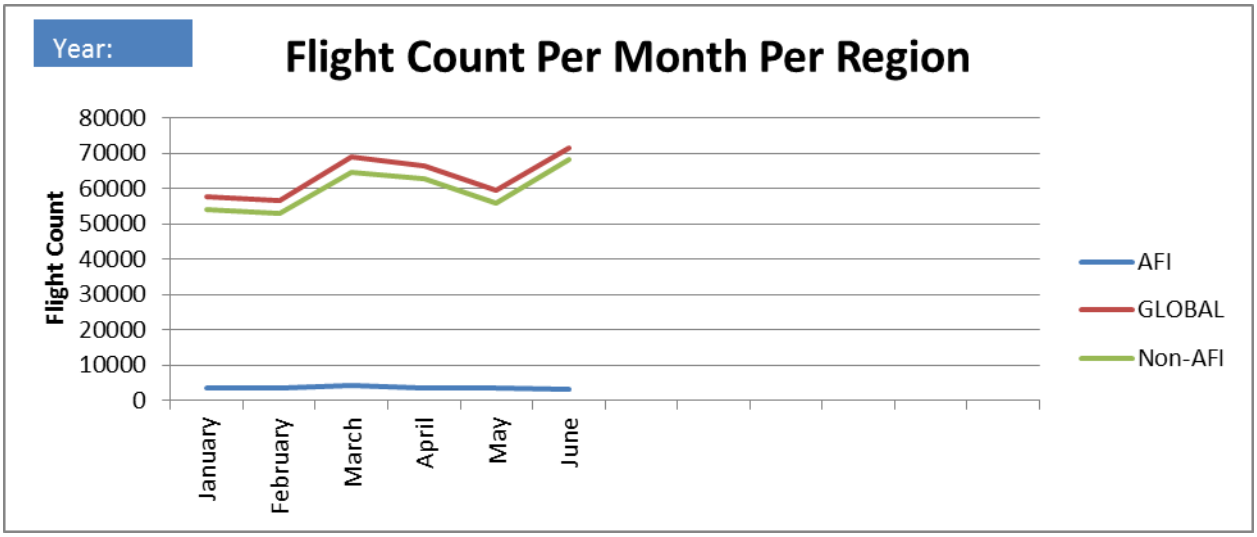


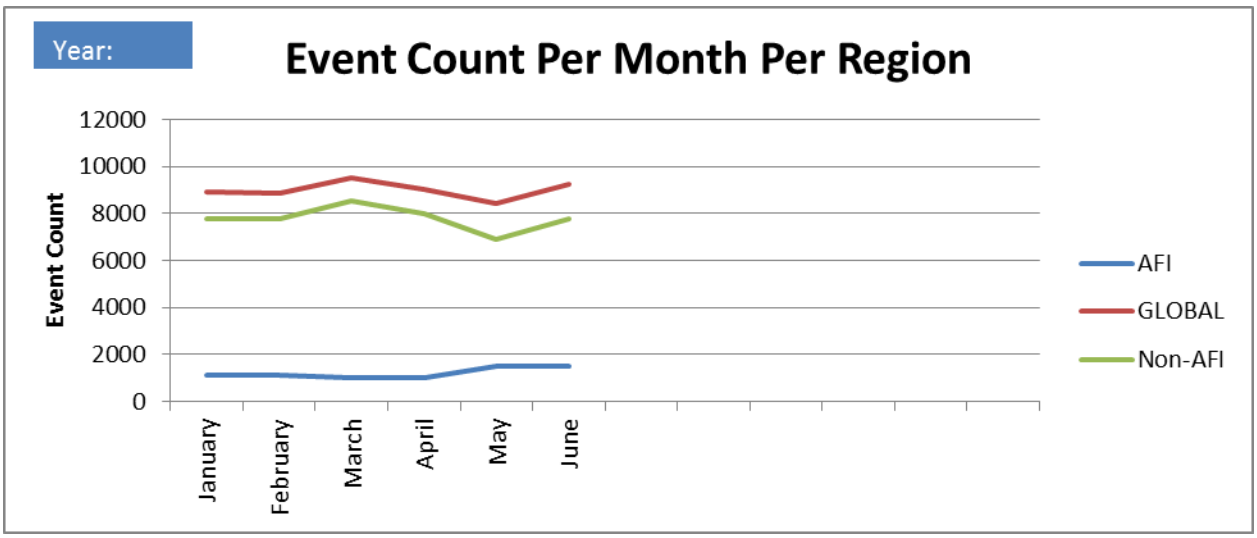
13. FDX data

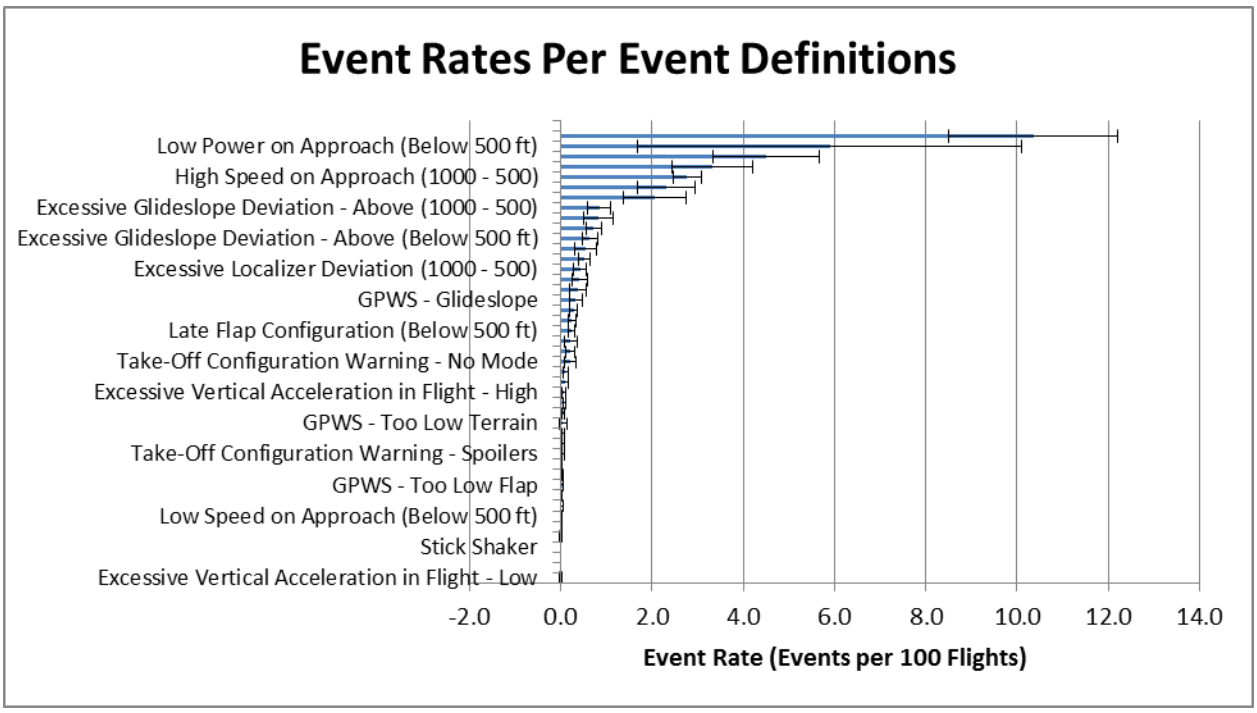
Flight Data eXchange (FDX) is an aggregated de-identified database of FDA/ FOQA type events that allows the user to identify commercial flight safety issues for a wide variety of safety topics, for many types of aircraft, across a global database; as well as allows flight operations and safety departments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



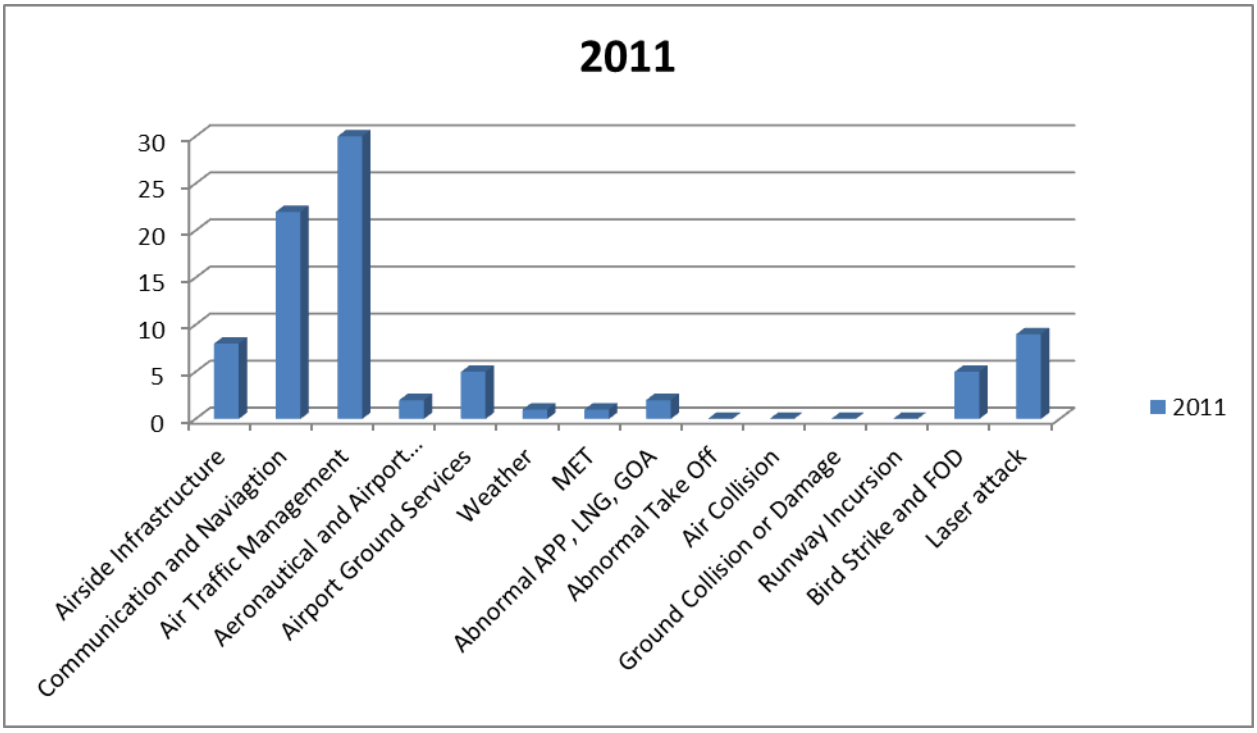

Year:
Flight Count Per Month Per Region
Flight Count
80000
70000
60000
50000
40000
30000
20000
10000
0
January
February
March
April
May
June
AFI
GLOBAL
Non-AFI

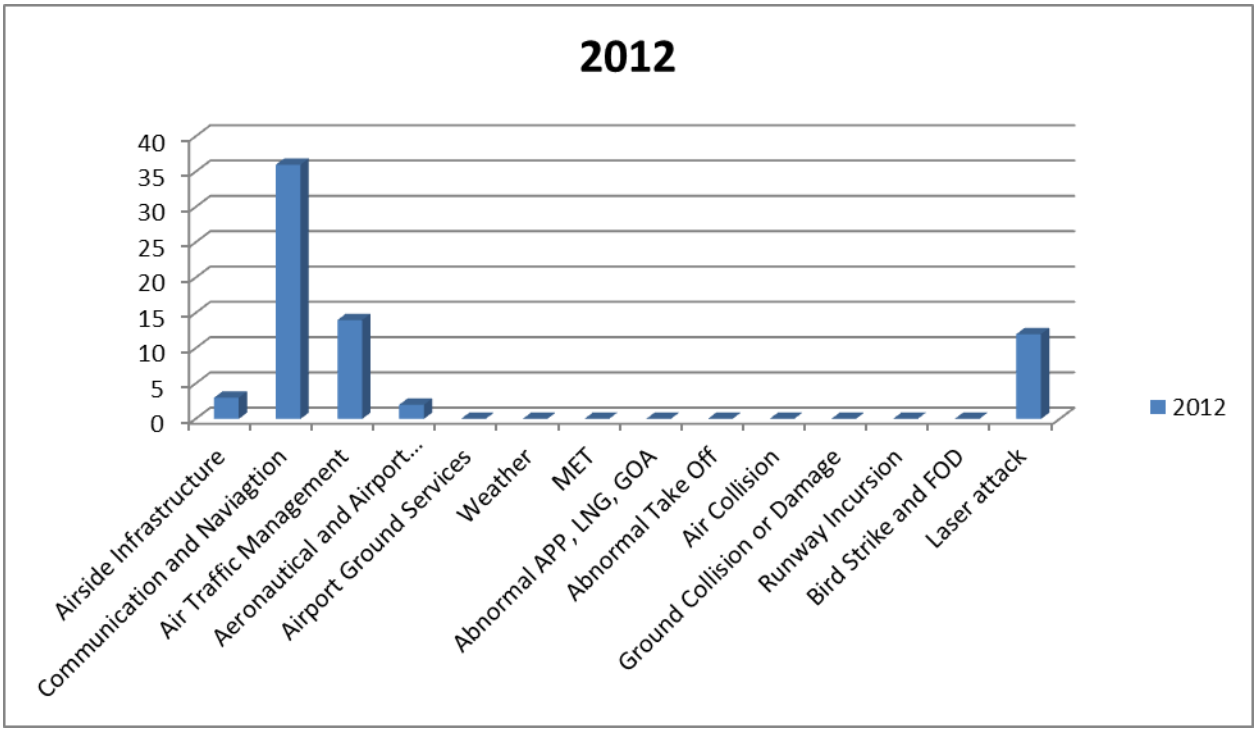

Year:
Event Count Per Month Per Region
Event Count
12000
10000
8000
6000
4000
2000
0
January
February
March
April
May
June
AFI
GLOBAL
Non-AFI



14. 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.




2012
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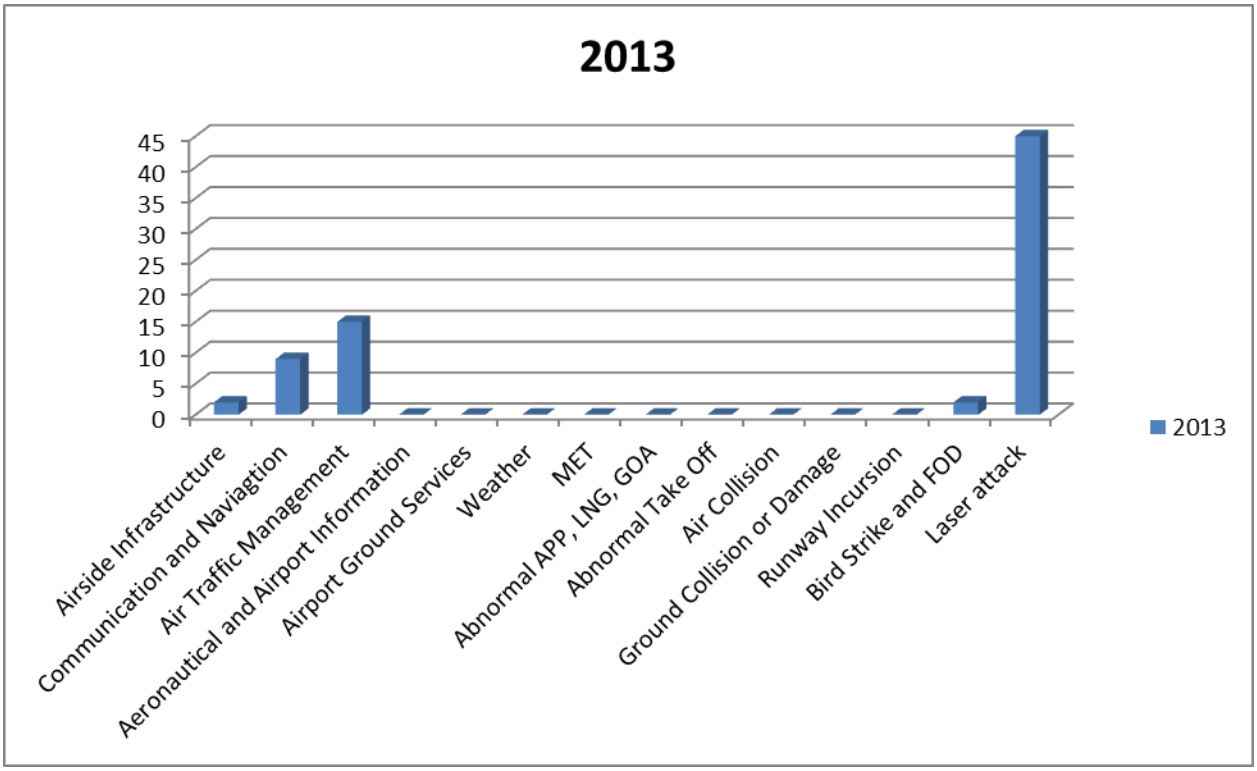
Airside Infrastructure
Communication and Naviagtion
Air Traffic Management
Aeronautical and Airport...
Airport Ground Services
Weather
MET
Abnormal APP, LNG, GOA
Abnormal Take Off
Air Collision
Ground Collision or Damage
Runway Incursion
Bird Strike and FOD
Laser attack
2012


2013
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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

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

15. On demand analysis of identified risks or hazards

Call-sign Confusion

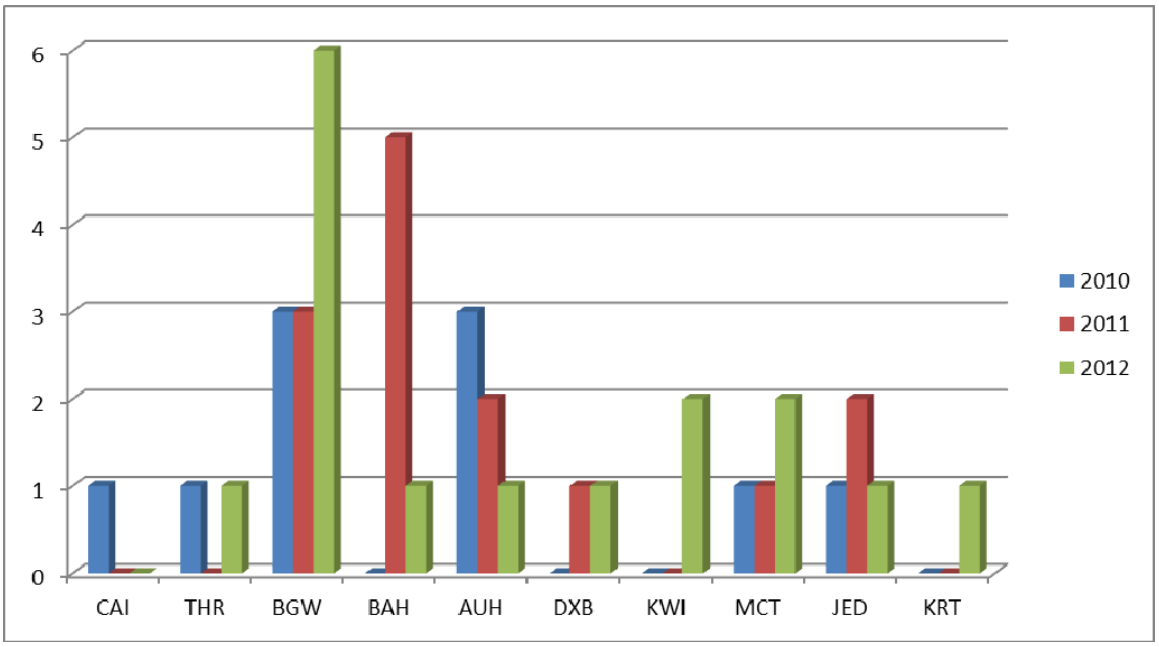
The use of similar call signs by aircraft operating in the same area often gives rise to potential and actual flight safety incidents. Reports have been raised by airline operators and Air Navigation Service Providers of common incidents related to call-sign conflict in the Middle East.

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.

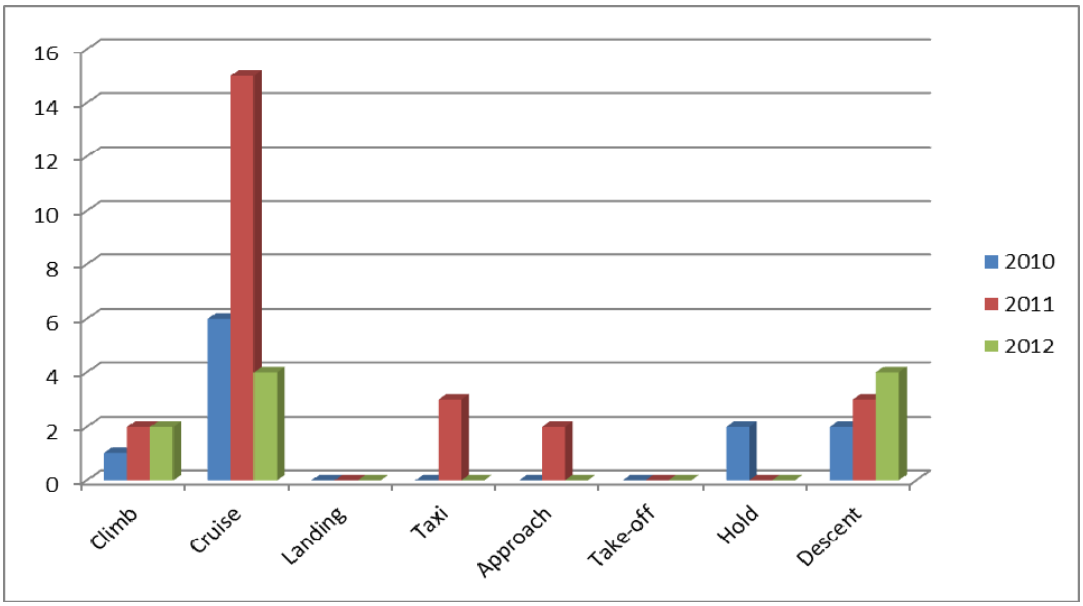
The call-sign confusion survey was distributed to all 29 IATA members and all 15 States in the MID Region. Responses from 9 airlines were received. Four airlines reported that they have no incidents to report, and one reported no occurrences in the MID region.

The following charts illustrate the collected responses.

- Location of Occurrence



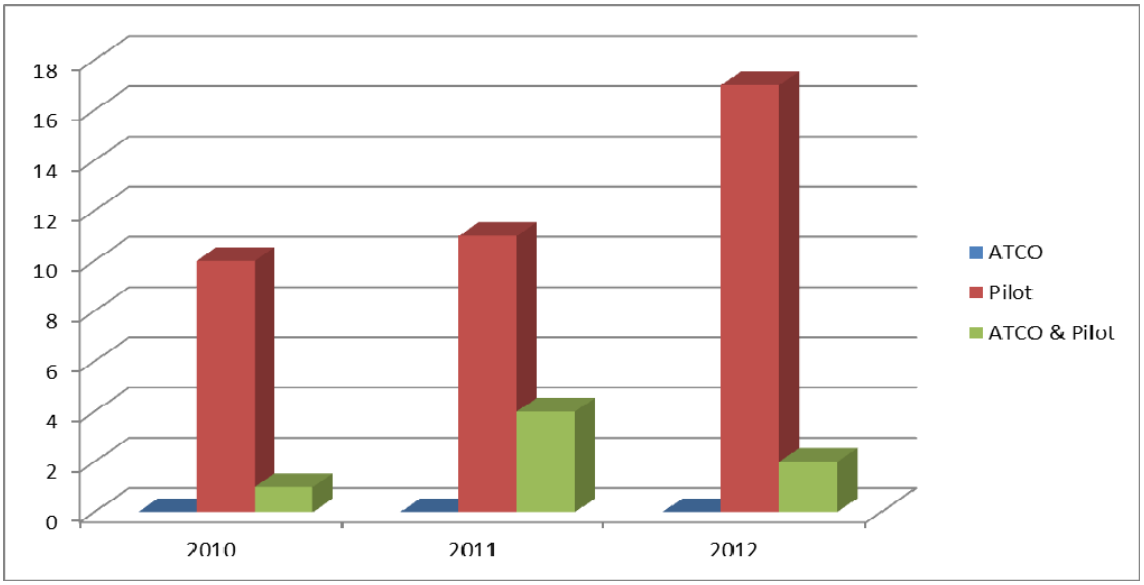
- Flight Phase



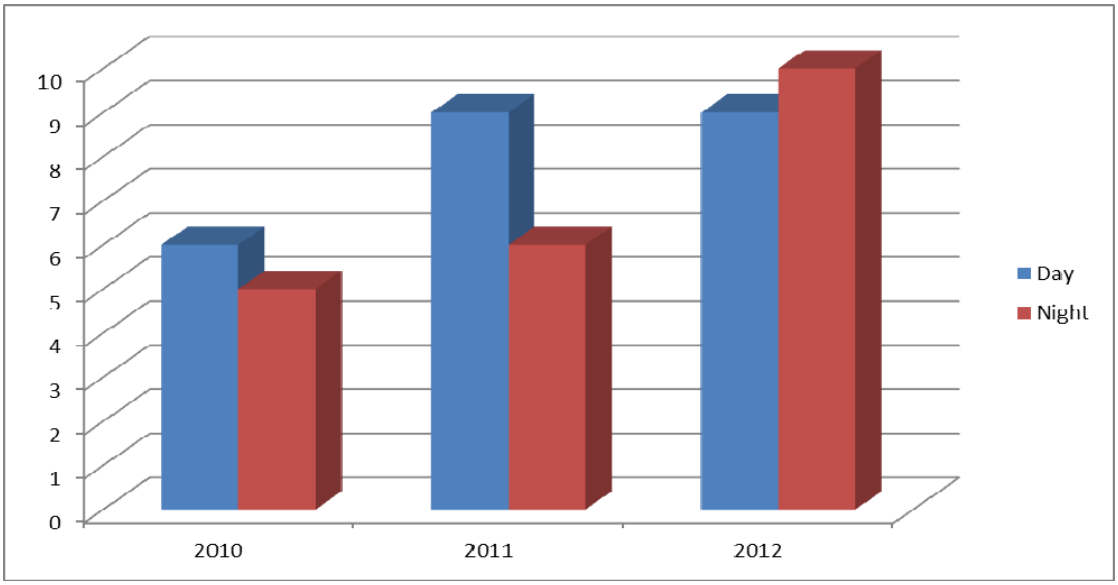
- Severity

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

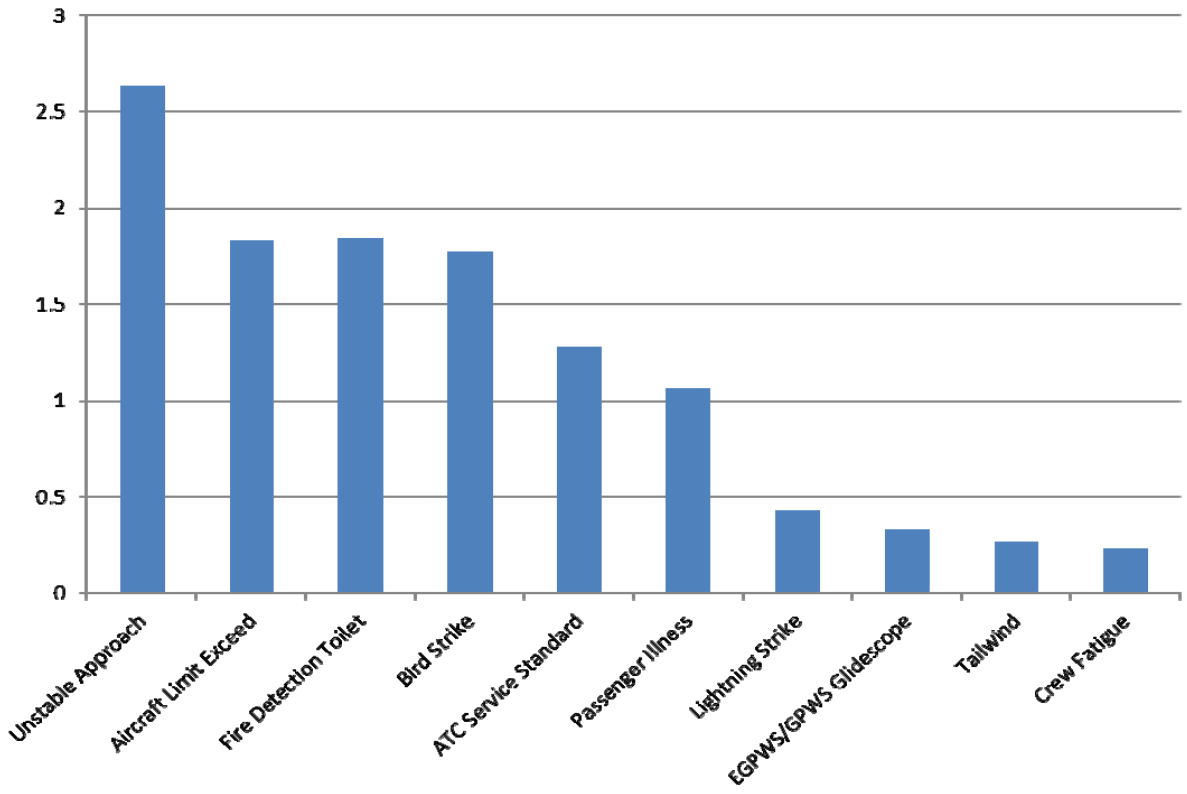


- Main root Cause

16. 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.

17. State Safety Program (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).

- <u>Safety Data Collection under the SSP:</u>

  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."

Appendix A - Definitions

Accident: an occurrence associated with the operation of an ircraft 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 fro 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 fligh 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	**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.

running. It includes all actions of power back for the purpose of positioning the aircraft for Taxi-out.	
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.

-END-