



Regional Aviation Safety Group -

Middle East

(RASG-MID)

MID Region Annual Safety Report

**Third Edition
March 2015**



RASG-MID Annual Safety Report – Third Edition

Third Edition, March 2015

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

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RASG-MID Annual Safety Report

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1. Foreword

The Regional Aviation Safety Group-Middle East (RASG-MID) was established in September 2011 to develop an integrated, data driven strategy and implement a work program that supports a regional performance framework for the management of safety.

RASG-MID supports the implementation of the ICAO Global Aviation Safety Plan (GASP) and addresses global aviation safety from a regional perspective. The RASG-MID membership includes representatives from ICAO, MID states, and international organizations.

RASG-MID consists of three main teams; the Annual Safety Report Team (ASRT), the Regional Aviation Safety Team (RAST), and the Safety Support Team (SST). The three teams work together in a collaborative manner to identify and address safety risks in the MID region as follows:

1. The Annual Safety Report Team (ASRT) is in charge of collecting and analysing safety information. The team is also responsible for the identification of the safety focus areas and the production of the RASG-MID Annual Safety Report (ASR).
2. The Regional Aviation Safety Team (RAST) is in charge of developing Safety Enhancement Initiatives (SEIs) and Detailed Implementation Plans (DIPs) for the key safety focus areas identified by the Annual Safety Report Team (ASRT).
3. The Safety Support Team (SST) is in charge of supporting the Regional Aviation Safety Team (RAST) with safety enhancement initiatives that are not directly related to safety focus areas such as emerging risks.

The diagram below illustrates the framework adopted by RASG-MID to identify and address safety risks in the MID region.



2. Executive Summary

The RASG-MID Annual Safety Report (ASR) – Third Edition presents analysis performed by the RASG-MID Annual Safety Report Team (ASRT). The safety information presented in this report is based on the compilation and analysis of data provided by Boeing, IATA, and ICAO. The ASR includes the following three main sections:

1. Reactive safety information
2. Proactive safety information
3. Predictive safety information

The reactive safety information section represents the largest portion of the report. It contains analysis of accident data provided from different sources Boeing, IATA and ICAO, in order to conclude the Focus Areas (main killers) in the MID Region. For harmonization purpose (with the ICAO Global and Regional Safety Reports), ICAO accident statistics have been used as the main source of data to calculate accident rates and monitor the progress of achieving the Regional Safety Targets as outlined in the MID Region Safety Strategy. However, safety data collected from other sources including Boeing and IATA was used also for the identification of Focus Areas, determination of contributing factors and root causes in order to support the development of mitigation measures.

The proactive safety information is based on the results of the ICAO USOAP-CMA and IATA IOSA and ISAGO, as well as, other occurrences (Incidents) reported by states or airlines in order to identify emerging risks in the Region.

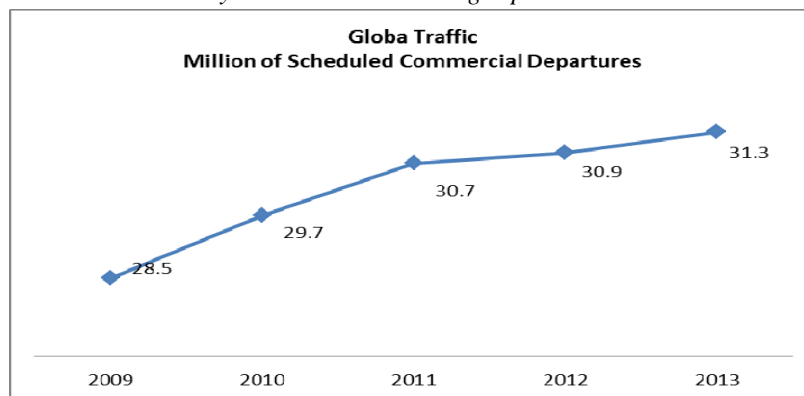
The aim of the predictive safety information is to collect and analyse safety data to proactively identify safety concerns before accidents or incidents occur, to develop timely mitigation and prevention measures. This section provides analysis of the implementation status of State Safety Programme (SSP) in the MID Region.

2.1 Traffic Volumes

The global scheduled commercial international operations accounted for approximately 31.3 million departures in 2013, compared to 28.5 million departures in 2009.

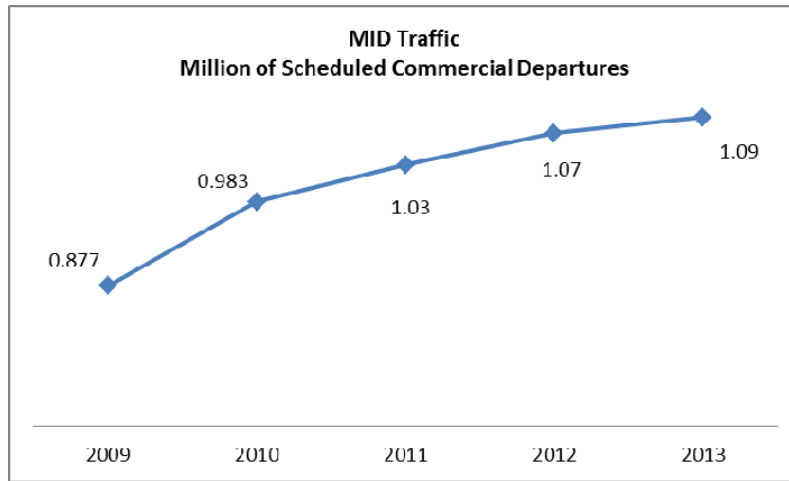
Note:

The traffic data presented here is used by ICAO when estimating exposure to risk or when calculating accident rates.



Source: ICAO-iSTARS

The MID Region shows a stable growth in traffic volumes. Total scheduled commercial departures in 2013 included approximately 1.09 million departures compared to 0.877 million departures in 2009.



Source: ICAO-iSTARS

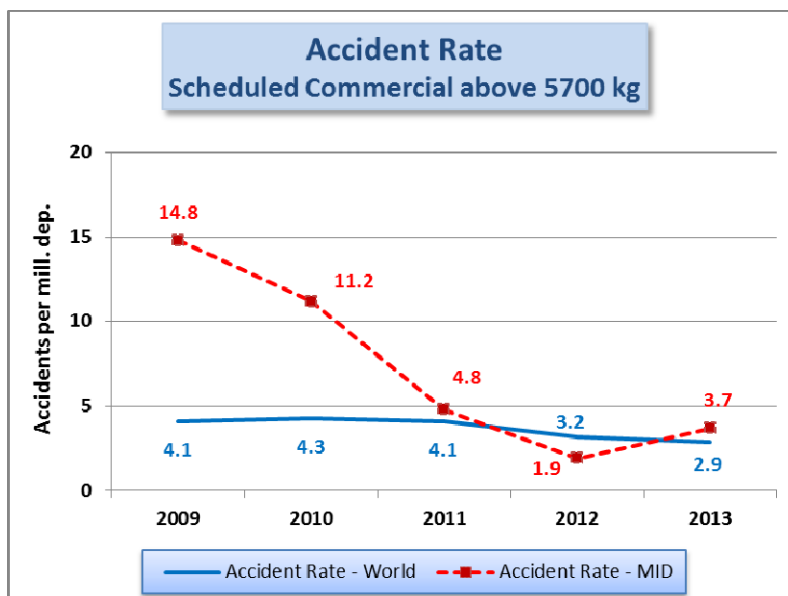
2.2 Accidents Rate

The year-over-year accident statistics indicate a reduction in the overall number of global accidents as well as the accident rate, a positive trend for air transportation safety. The average global accident rate for the period 2009-2013 is 3.72 accidents per million departures.

The average accident rate in the MID Region for the same period (2009-2013) is 7.28. It's also to be highlighted that the MID Region witnessed a reduction of 75% in accidents rate in 2013 compared to 2009. However, compared to 2012, the MID Region registered an increase of 194.7% in the accidents rate.

Note:

The accident data presented here is the official ICAO accident statistics, used for the development of the ICAO safety reports. The data is based on scheduled commercial operations involving aircraft having a Maximum Take-off Weight (MTOW) above 5700 kg.

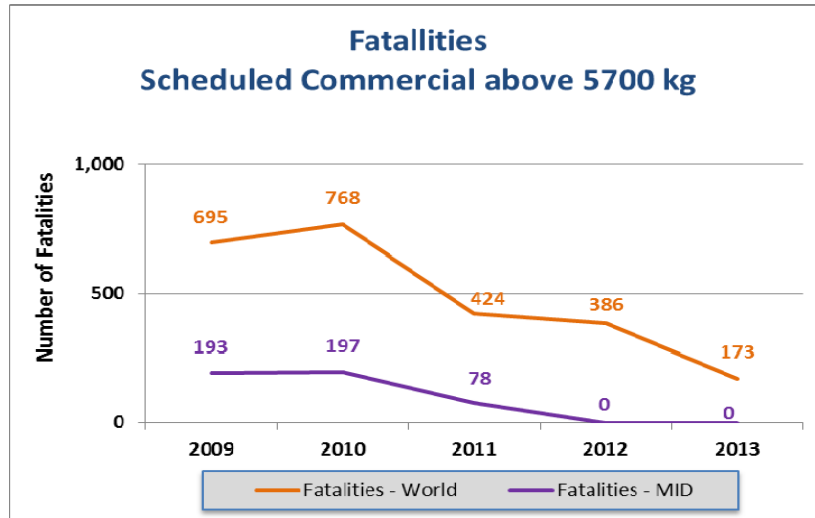


Source: ICAO-iSTARS

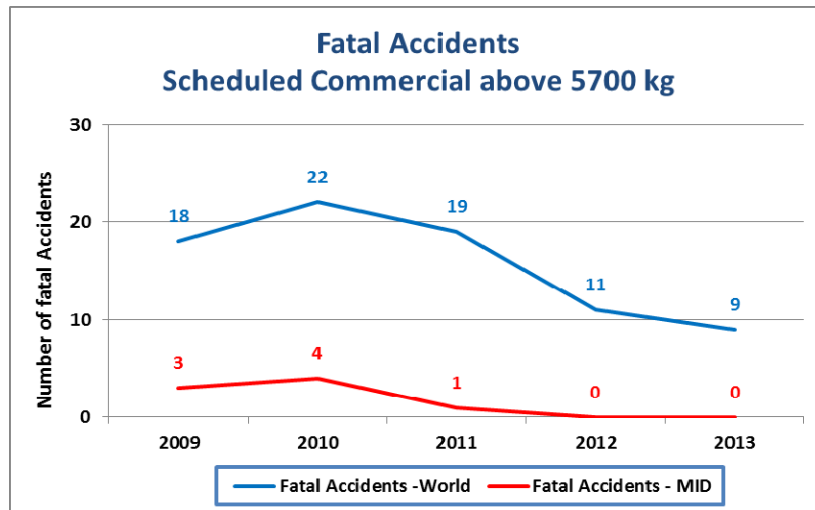
2.3 Fatalities

In terms of fatalities, the 173 fatalities in 2013 represent the least number of fatalities in commercial scheduled air transport since the year 2000. When compared to previous years, the number of fatalities in 2013 represents a decrease of 53% from 2012 and is 65% below the average number of fatalities over the previous five year period.

The MID Region is considered the safest in term of fatalities with ZERO fatal accidents in 2012 and 2013.



Source: ICAO-Istars



Source: ICAO-iSTARS

2.4 Bottom Line

1. The MID Region witnessed a stable and continuous growth in traffic volumes (1.09 million departures in 2013 compared to 0.877 million departure in 2009).
2. The accidents rate in the MID Region has been decreasing continuously since 2009 to 2012 from 14.8 to 1.9 accidents per million departures, which is below the global rate 3.2.
3. In 2013, the accidents rate in the MID Region increased to 3.7 (approximately twice the rate in 2012), which is above the global rate 2.9.
4. The MID Region is the safest ICAO Region in terms of fatalities (no fatal accidents in 2012 and 2013).

3. Reactive Safety Information

The ICAO accident statistics, which are used for the development of the ICAO Safety Reports, is used also to calculate accident rates and monitor the progress of achieving the Safety Targets outlined in the MID Region Safety Strategy.

It should be highlighted that the analysis of safety data collected from other sources including Boeing and IATA was taken into consideration for the identification of Focus Areas, determination of contributing factors and root causes in order to support the development of appropriate mitigation measures.

It's to be highlighted that there are differences in the safety information provided by the participating organizations (Boeing, IATA and ICAO) due to the use of different criteria and classifications of accidents.

As part of the reactive safety information, statistical data related to Serious Incidents occurred in the MID Region is provided in this section.

This section also provides the progress of achieving the Safety Targets included in the MID Region Safety Strategy.

3.1 ICAO Data

ICAO's primary indicator of safety in the global air transport sector is the accident rate based on scheduled commercial operations involving aircraft having a Maximum Take-off Weight (MTOW) above 5700 kg. Exposure data is comprised of scheduled commercial operations that involve the transportation of passengers, cargo and mail for remuneration or hire, and is a preliminary estimate solely for the calculation of the accident rates.

ICAO iSTARS (ADREP et al.) application contains an aggregation of different accident and incident data sources including ADREP, Aviation Safety Network and Aviation Herald. This application provides the official ICAO accident statistics used for the development of the ICAO Safety Reports.

The main part of this section provides analysis of the accidents that occurred in the MID Region (State of Occurrence) for the period (2009-2013), which provides the official accident data used for monitoring the progress of achieving the Safety Targets in the MID Region Safety Strategy.

In addition, it provides statistical information concerning accidents of aircraft registered in the MID Region (State of Registry) as well as for the MID air operators (State of the Operator) using the same criteria mentioned above.

Note:

According to ICAO Annex 13 (Aircraft Accident and Incident Investigation):

State of Occurrence is the State in the territory of which an accident or incident occurs.

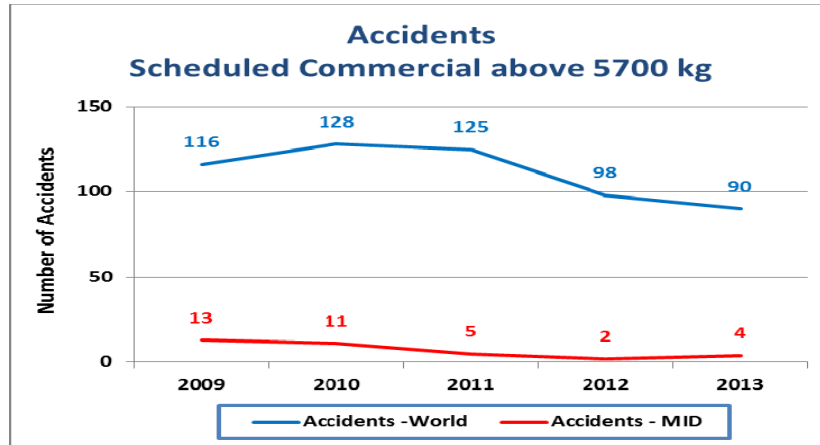
State of the Operator is the State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

State of Registry is the State on whose register the aircraft is entered.

3.1.1 Regional Accident Statistics (State of Occurrence)

(a) Total Number of Accidents

According to the chart below, a total number of 35 accidents occurred in the MID Region during the period 2009-2013 whereas a total of 557 accidents occurred worldwide.



The tables below provide a comparison of the accident numbers and rates as well as the fatalities between the world and the MID Region. The MID Region is considered the safest in terms of fatalities (no fatal accidents in 2012 and 2013)

Year		2009	2010	2011	2012	2013
MID	Accident Nr.	13	11	5	2	4
	Accident rate	14.8	11.2	4.8	1.9	3.7
World	Accident Nr.	116	128	125	98	90
	Accident rate	4.1	4.3	4.1	3.2	2.9

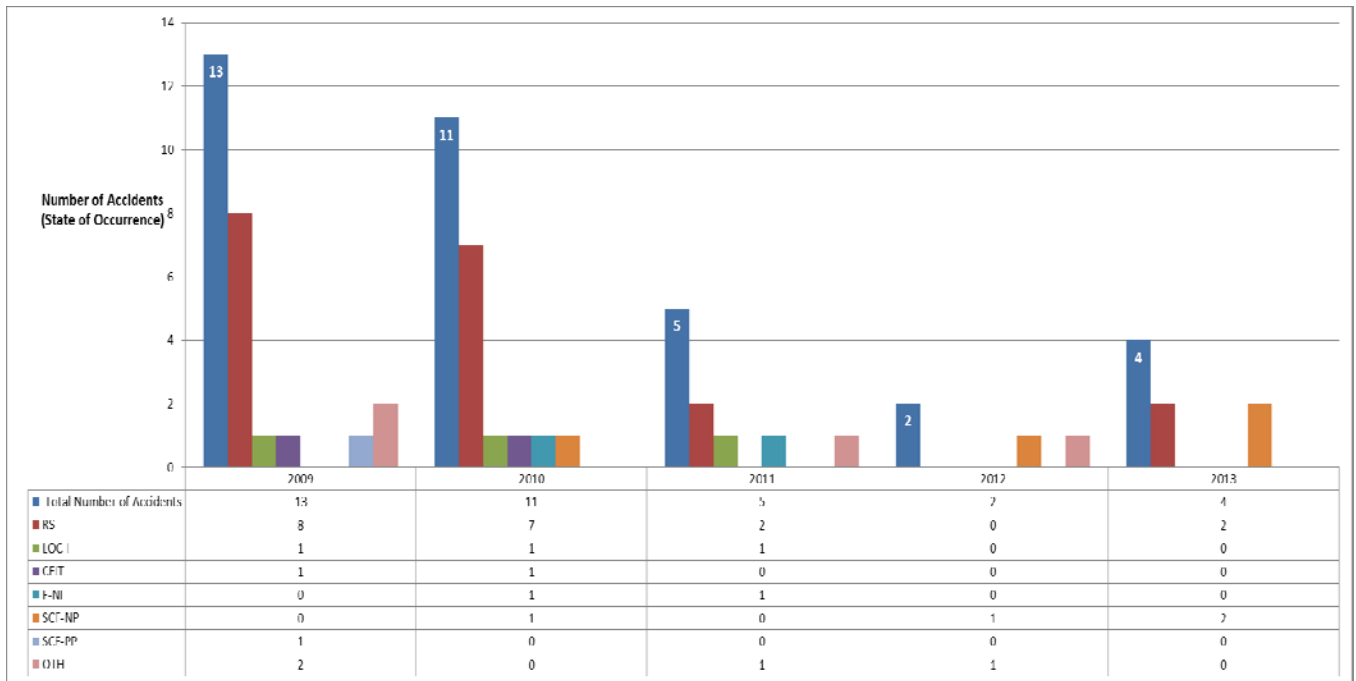
Year	2009	2010	2011	2012	2013
MID-Fatalities	193	197	78	0	0
World-Fatalities	695	768	424	386	173

Year	2009	2010	2011	2012	2013
MID-Fatal Accident	3	4	1	0	0
MID Rate	3.4	4.1	0.97	0	0
World-Fatal Accident	18	22	19	11	9
World Rate	0.63	0.74	0.62	0.36	0.29

(b) In Depth Analysis

The chart below shows the total number of accidents and accidents categories that occurred in the MID Region during the period (2009-2013). It's to be highlighted that 25 out of 35 accidents involved aircraft registered in the MID Region (22 out of these 25 belong to Air Operators in the MID Region).

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Note: For safety reporting, and in accordance with ADREP/ECCAIRS Taxonomy:

RS: Runway Safety, ICAO has grouped the following Occurrence Categories in RS: **ARC** (Abnormal Runway Contact), **CTOL** (Collision with obstacle(s), during take-off and landing), **USOS** (Undershoot/Overshoot), **ADRM** (Aerodrome) **BIRD** (Birdstrike), **GCOL** (Ground Collision), **RAMP** (Ground Handling), **LOC-G** (Loss of Control-Ground), **RE** (Runway Excursion) and **RI** (Runway Incursion).

LOC-I: Loss of Control –Inflight, loss of aircraft control while or deviation from intended flight path inflight.

CFIT: Controlled Flight Into or Toward Terrain, Inflight collision or near collision with terrain, water, or obstacle without indication of loss of control.

F-NI: Fire/Smoke (Non-Impact), fire or smoke in or on the aircraft, in flight or on the ground, which is not the result of impact.

SCF-NP: System/Component Failure or Malfunction (Non-Powerplant), failure or malfunction of an aircraft system or component - other than the Powerplant.

SCF-PP: System/Component Failure or Malfunction (Powerplant), failure or malfunction of an aircraft system or component - related to the Powerplant.

OTH: Other, any occurrence not covered under another category.

UNK: Unknown or Undetermined, insufficient information exists to categorize the occurrence.

The MID Region witnessed 7 fatal accidents in the period (2009-2011); however, no fatal accident occurred in the MID Region in 2012 and 2013:

	Number of fatal Accidents	Risk Category	No of Fatalities	Aircraft registered in the MID Region	Air Operator in the MID Region
2009	3	1 LOC-I	6	Yes	Yes
		1 CFIT	168	Yes	Yes
		1 RS	19	No	No
2010	3	1 LOC-I	90	No	No
		1 CFIT	103	Yes	Yes
		1 F-NI	2	No	No
2011	1	1 LOC-I	78	Yes	Yes
2012	None				
2013	None				

Based on an in-depth analysis of the ICAO accidents statistics for the MID Region, the following is highlighted:

- a) In terms of frequency, the most frequent accidents in the MID Region for the period 2009- 2013 are:
 1. Runway Safety (RS)
 2. System/Component Failure-Non-Power plant (SCF-NP)
 3. Loss of Control –Inflight (LOC-I)
 4. Controlled Flight Into Terrain (CFIT)
 5. Fire/Smoke, Non-Impact (F-NI)

- b) In terms of fatality, the top three fatal accident categories in the MID Region for the period 2009 – 2013 are:
 1. LOC-I
 2. CFIT
 3. RS
 4. F-NI

- c) The distribution of the Runway Safety related accidents (19), is as follows:
 - i. 7 Runway Excursion (RE) (36.8%)
 - ii. 7 Abnormal Runway Contact (ARC) (36.8%)
 - iii. 2 Ground Handling (RAMP) (10.5%)
 - iv. 2 Ground Collision (GCOL) (10.5%)
 - v. 1 Loss of Control-Ground (LOC-G) (5.2%)

In order to facilitate the identification and prioritization of the main Regional Focus Areas (FAs), the RASG-MID/3 meeting agreed that the accidents are categorized in terms 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;
3. Minor: little consequences.

Accordingly, the following matrix, endorsed by the RASG-MID/3 meeting, shows the assessment for the top accidents categories;

Severity \ Frequency	Frequency					
	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18

Accident Category	Frequency	Severity	Frequency x Severity
RS	1	2	2
SCF-NP	2	3	6
LOC-I	3	1	3
CFIT	4	1	4
FN-I	5	3	15

In accordance with the matrix above and based on the analysis of the ICAO data, the priorities in the MID Region should be:

- 1) RS
- 2) LOC-I
- 3) CFIT
- 4) SCF-NP

It's to be highlighted that the regional priorities (RS, LOC-I and CFIT) are in line with the global priorities as outlined in the ICAO Global Aviation Safety Plan (GASP). The following tables provide a comparison between the global and regional trends related to these priorities, including accidents numbers and rates and number of fatalities for the period (2009-2013).

Runway Safety (RS)

Year		2009	2010	2011	2012	2013
MID	Accident Nr.	8	7	2	0	2
	Accident rate	9.1	7.1	1.9	0	1.8
World	Accident Nr.	61	71	68	43	56
	Accident rate	2.1	2.4	2.2	1.4	1.8

Year		2009	2010	2011	2012	2013
MID-Fatalities		19	2	0	0	0
World-Fatalities		26	179	28	1	11

LOC-I

Year		2009	2010	2011	2012	2013
MID	Accident Nr.	1	1	1	0	0
	Accident rate	1.1	1.01	0.93	0	0
<hr/>						
World	Accident Nr.	3	3	4	1	3
	Accident rate	0.1	0.1	0.1	0	0.1

Year		2009	2010	2011	2012	2013
MID-Fatalities		6	90	78	0	0
<hr/>						
World-Fatalities		287	112	122	31	104

CFIT

Year		2009	2010	2011	2012	2013
MID	Accident Nr.	1	1	0	0	0
	Accident rate	1.1	1.01	0	0	0
<hr/>						
World	Accident Nr.	4	4	5	3	2
	Accident rate	0.1	0.1	0.2	0.1	0.1

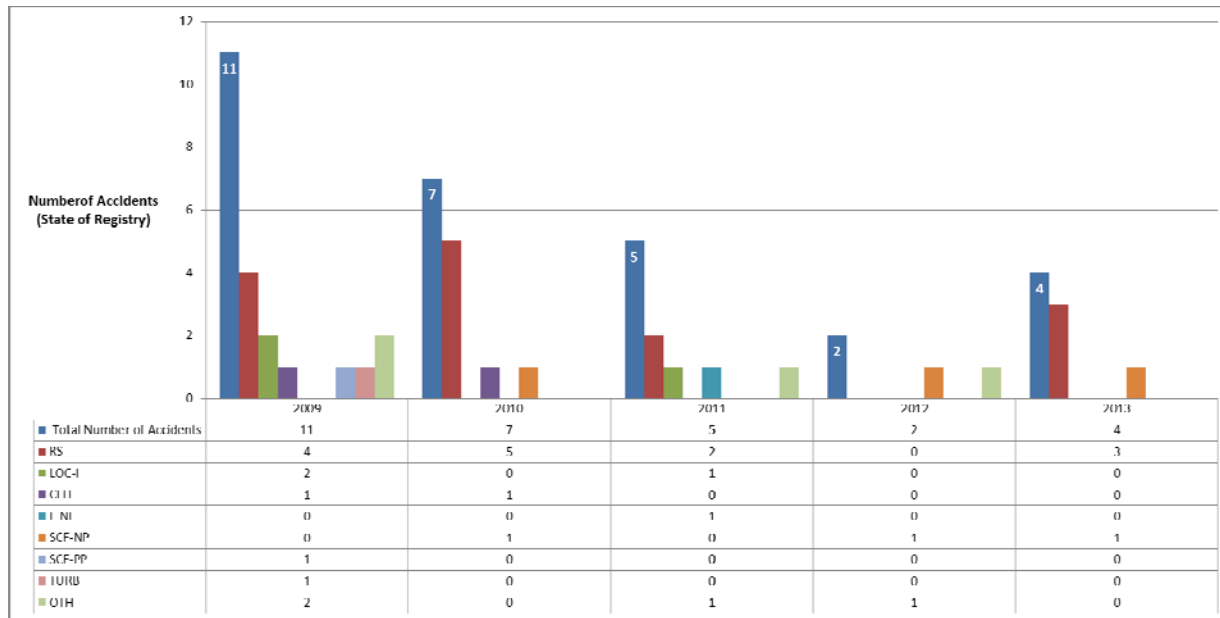
Year		2009	2010	2011	2012	2013
MID-Fatalities		168	103	0	0	0
<hr/>						
World-Fatalities		9	204	131	139	23

3.1.2 Regional Accident Statistics (State of Registry)

ICAO data shows that 29 is the total number of accidents that involved aircraft registered in the MID States for the period 2009 - 2013. 25 out of these 29 accidents occurred in the MID Region as indicated in Section 3.1.1 above. The remaining 4 accidents (3 in 2009 and 1 in 2013) involved aircraft registered in the MID Region; however, they occurred outside the Region, as follows:

	Risk Category	Fatalities
2009	RS	None
	LOC-I	152
	TURB (Turbulence Encounter)	None
2013	RS	None

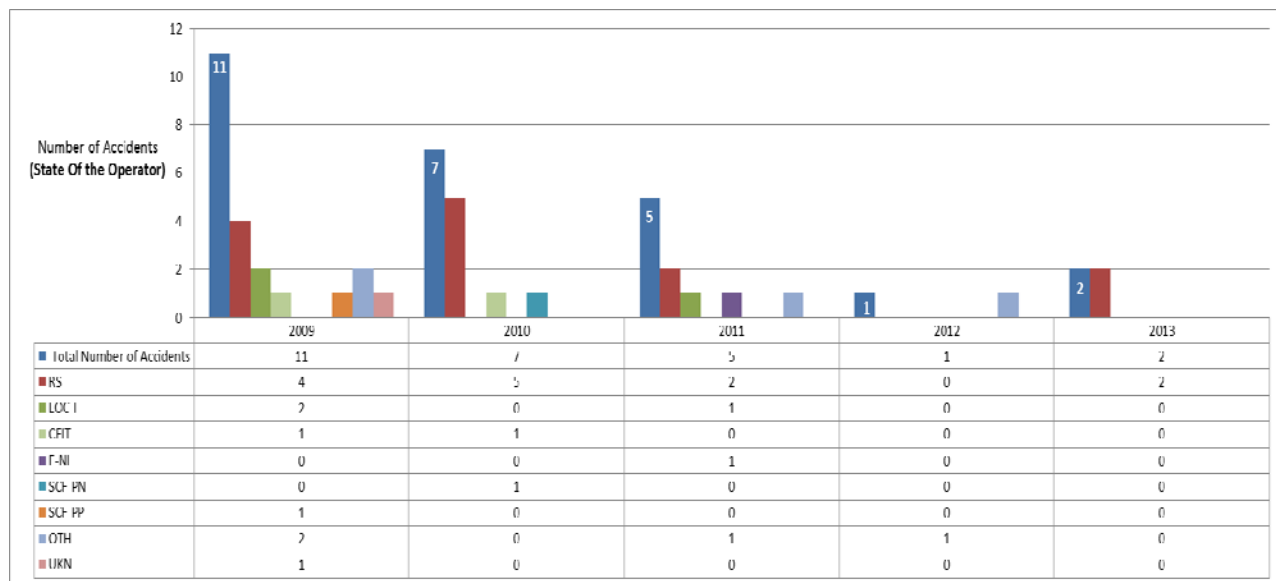
Accordingly, the distribution of risk categories based on accidents involving aircraft registered in the MID Region is shown in the chart below:



3.1.3 Regional Accident Statistics (State of the Operator)

ICAO data shows that 26 is the total number of accidents that involved aircraft belonging to Air Operators in the MID Region for the period 2009-2013.

2 out of the 26 accidents occurred outside the MID Region and 4 with aircraft registered out the Region as well. The chart below shows the distribution of risk categories based on accidents involving MID Air Operators:

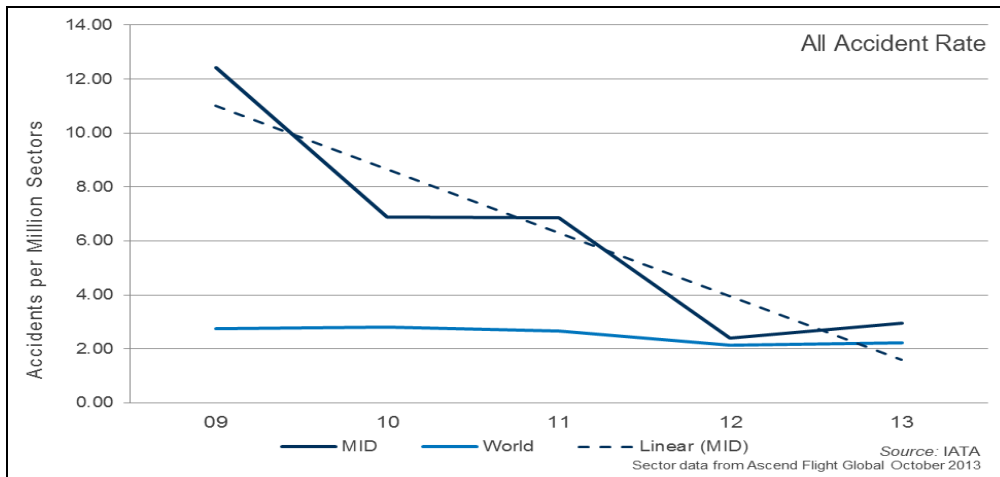


3.2 IATA Data

To calculate the regional accident rates, IATA determines the accident region based on the operators country. Moreover, the operator’s country is specified in the operator’s Air Operator Certificate (AOC). For example, if a French-registered operator has an accident in the MID region, this accident is counted as “European” accident as far as regional accident rates are concerned.

Moreover, the IATA accidents database captures operational accidents for aircraft with maximum take-off weight (MTOF) 5,700 KG which happen during a commercial operation – operation including flights listed as a scheduled or unscheduled passenger or cargo flight, or positioning flights). Non-operational accidents are excluded (military, human relief, test flights, training, etc). The data below captures accident information for the time period 2009 – 2013 and is narrowed down to the MID States.

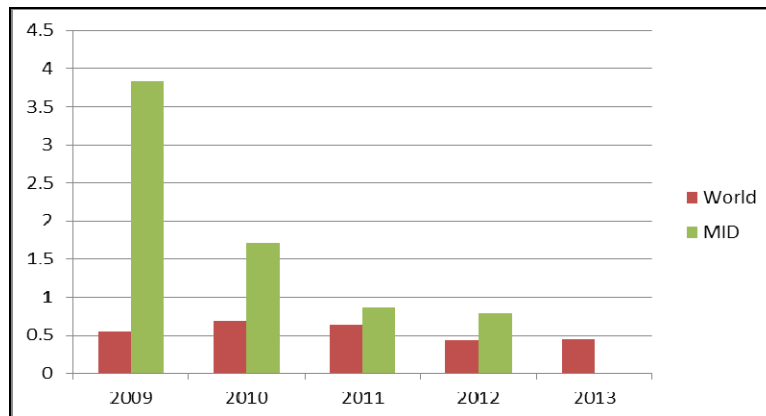
3.2.1 Regional Accidents Rates (Per million departures)



3.2.2 Regional Fatal Accident Rates (Per million departures)

	09	10	11	12	13
World	0.55	0.68	0.64	0.43	0.44

	09	10	11	12	13
MID	3.83	1.72	0.86	0.79	0.00

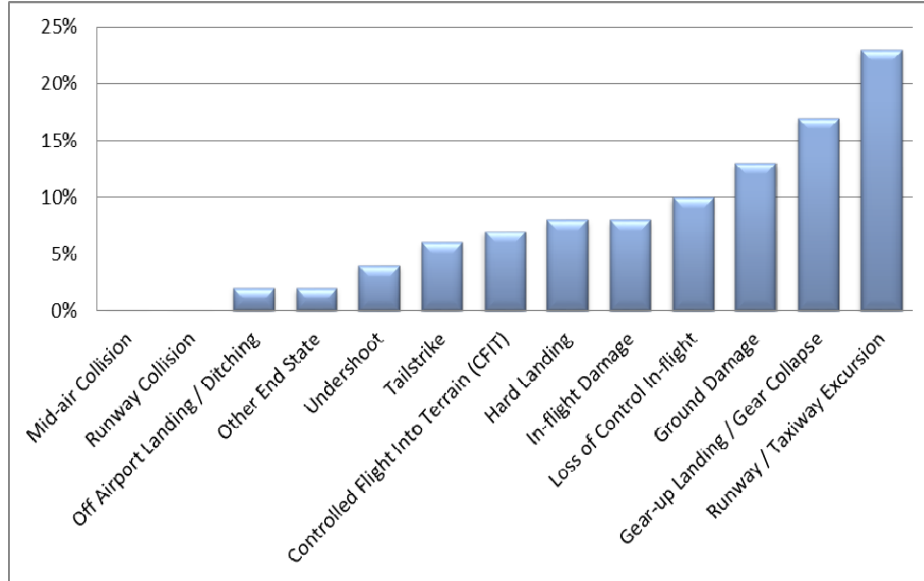


3.2.3 Analysis of MID Accidents between 2009 and 2013

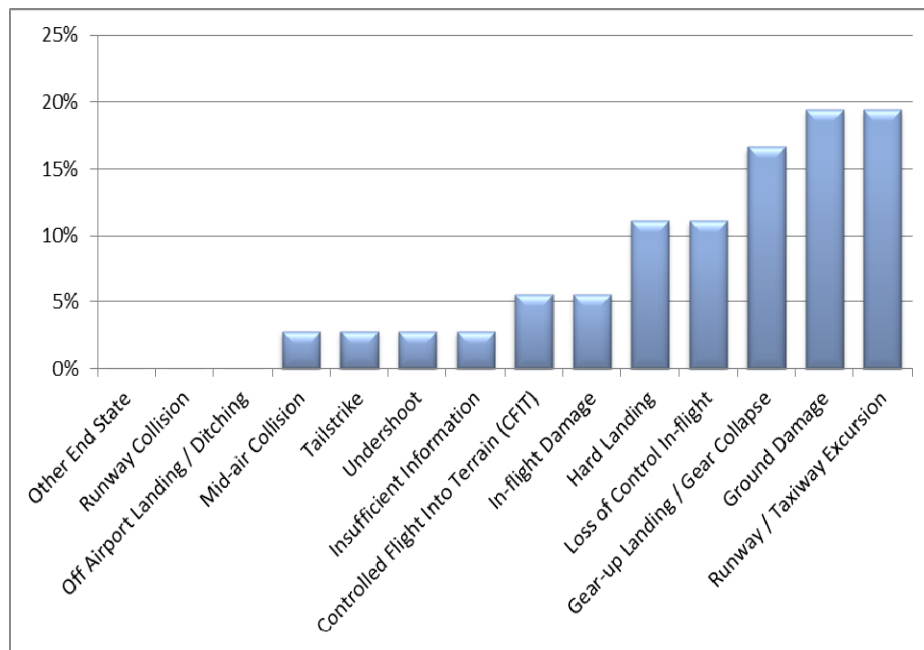
This analysis provides an overview of the accidents between 01 Jan 2009 and 31 Dec 2013.

3.2.3.1 Accidents categories and analysis

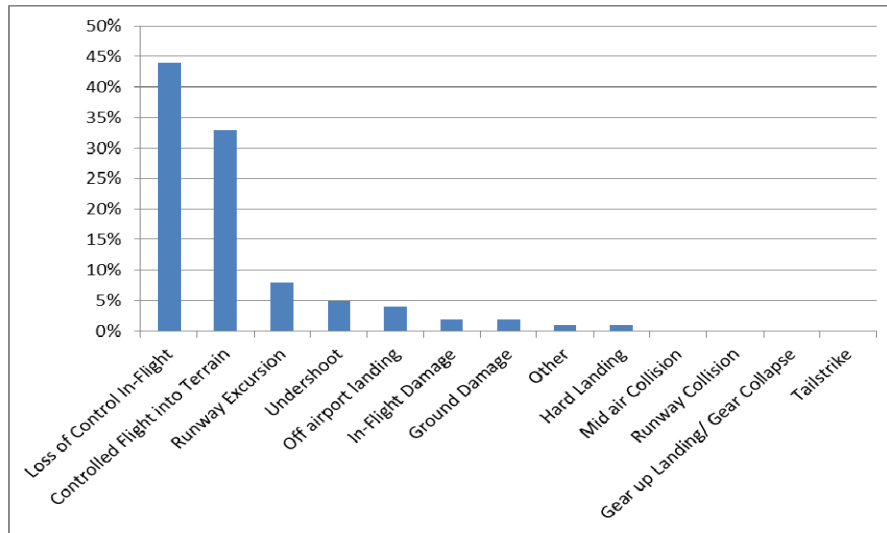
(a) World Accident Categories: 2009-2013



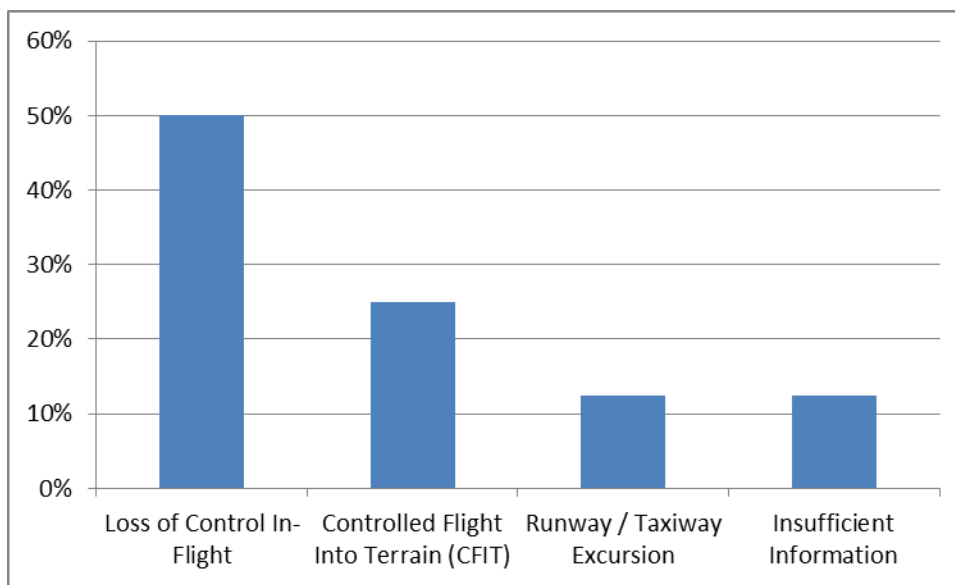
(b) MID Accident Categories: 2009-2013



(e) World Fatal Accident Categories (2009 – 2013)



(f) MID Fatal Accident Categories (2009 - 2013)



(g) IATA In-Depth Analysis of MID accidents

Taking a more in-depth look at the IATA accidents statistics for the MID Region (2009-2013), the following observations are made;

- a) In terms of frequency, the most frequent accidents categories in the MID Region for the period 2009 – 2013 are;
 1. Runway / Taxiway Excursions
 2. Ground Safety
 3. Gear-up Landing / Gear Collapse
 4. Loss of Control Inflight
 5. Hard Landing

- b) In terms of fatality, the top three fatal accidents categories in the MID Region for the period 2009 – 2013 are;
 - 1. LOC-I
 - 2. CFIT
 - 3. Runway/Taxiway Excursions
- c) Top four flight phases when fatal accidents occur in the MID Region are Go-around (GOA), Take off (TOF), Engine Start/Depart (ESD) and Landing (LND).
- d) To facilitate the identification of the safety priority areas; the accidents data has been analysed in terms of frequency and severity using the below risk matrix (for Frequency rating: 1 is the most frequent and 6 is the least frequent. For Severity: 1 is the most severe and 3 is the least severe):

Accident Category	Frequency	Severity	Frequency*Severity
Runway/ Taxiway Excursion	1*	2	2
Ground Safety	1*	3	3
Gear up Landing / Gear Collapse	3	3	9
Hard Landing	4	3	12
Loss of Control In Flight	5	1	5
Controlled Flight Into Terrain	6	1	6

** Note: Runway/ Taxiway Excursion and Ground Safety were rated the same because they had the same number of accidents throughout the period 2009 - 2013*

- e) Based on the above risk matrix, priority was given to the categories which scored 6 or below. Therefore, the safety priority areas according to IATA’s accidents data are:
 - i. Runway/ Taxiway Excursion
 - ii. Ground Safety
 - iii. Loss of Control In Flight (LOC-I)
 - iv. Controlled Flight Into Terrain (CFIT)
- f) Below is an in-depth analysis for each of the priority areas identified by IATA for the MID Region covering the period 2009 till 2013:

Runway Excursion

- 1. Trend 2009 to 2013

		2009	2010	2011	2012	2013
MID	Accident rate	1.91	0.86	2.57	0.79	0.00
	# Accidents	2	1	3	1	0
World	Accident rate	0.70	0.59	0.49	0.60	0.47
	# Accidents	23	20	17	21	17

2. Severity of outcomes

Accident Fatal

Fatal	1
Non Fatal	6

Total Fatalities	16
------------------	----

3. Contributing factors:

- i. Errors related to Manual Handling/ Flight controls
- ii. Errors related to SOP adherence/ SOP cross verification
- iii. Continued landing after unstable approach
- iv. Long/floated/bounced/firm/off-center/crabbed landing
- v. Unstable approach
- vi. Overall crew performance

Ground Safety

1. Trend 2009 to 2013

		2009	2010	2011	2012	2013
MID	Accidents rate	0.96	1.72	0.86	0.00	2.20
	# Accidents	1	2	1	0	3
World	Accidents rate	0.27	0.30	0.43	0.23	0.33
	# Accidents	9	10	15	8	12

2. Severity of outcomes

Accident Fatal

Fatal	0
Non Fatal	7

Total Fatalities	0
------------------	---

Level of Damage

Hull Loss	1
Substantial Damage	6

3. Contributing factors:

- i. Deficiencies in Regulatory Oversight
- ii. Errors related to Crew to External Communication
- iii. Errors related to SOP Adherence/ SOP cross verification
- iv. Overall crew performance

Loss of Control In-flight (LOC-I)

1. Trend 2009 to 2013

		2009	2010	2011	2012	2013
MID	Accidents rate	2.87	0.00	0.86	0.00	0.00
	# Accidents	3	0	1	0	0
World	Accidents rate	0.27	0.30	0.23	0.17	0.22
	# Accidents	9	10	8	6	8

2. Severity of outcomes

Accident Fatal

Fatal	4
Non Fatal	0

Total Fatalities	404
------------------	-----

3. Contributing factors:

- i. Aircraft Malfunction: Contained Engine Failure/ Power plant Malfunction
- ii. Overall crew performance

Controlled Flight into Terrain (CFIT)

1. Trend 2009 to 2013

		2009	2010	2011	2012	2013
MID	Accidents rate	0.00	0.86	0.00	0.79	0.00
	# Accidents	0	1	0	1	0
World	Accidents rate	0.06	0.21	0.29	0.17	0.17
	# Accidents	2	7	10	6	6

2. Severity of outcomes

Accident Fatal

Fatal	2
Non Fatal	0

Total Fatalities	135
------------------	-----

3. Contributing factors:

- i. Deficiencies in Safety Management
- ii. Poor visibility/ IMC
- iii. Ground-based nav-aid malfunction or not available

3.3 Other Data

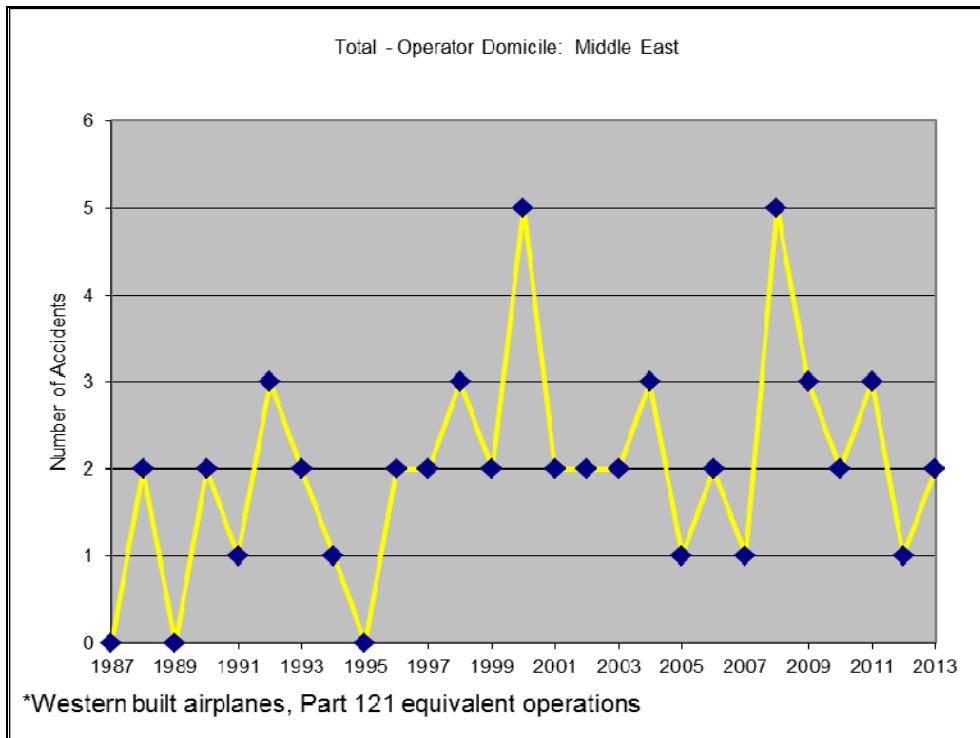
3.3.1 Boeing Data

Boeing safety data comes from the accident set which CAST (Commercial Aviation Safety Team) compiles each year. The accident set includes the following:

- a) Worldwide hull loss of Western Built airplanes
- b) Accidents are grouped per state of registry as per the ICAO MID region
- c) Operations covered in the analysis includes the below criteria:
 - i. All commercial passenger operations (scheduled or non-scheduled) as long as the number of passenger seats exceeds 9
 - ii. Cargo operations are included (assuming the plane meets the 7500lb requirement)
 - iii. Military-operated planes are excluded. Contracted military cargo flights (i.e. on a commercial operator) are included)
 - iv. Transport of military/paramilitary/peacekeeping forces and workers on non-military planes are included as part of the 121 equivalent (>9 passengers)
 - v. Company owned planes transporting their own employees are not included
 - vi. Chartered planes are included

3.3.1.1 Number of accidents:

The Chart below shows the total number of accidents for the period (1987-2013)



3.3.1.2 Fatality risk per type of accident:

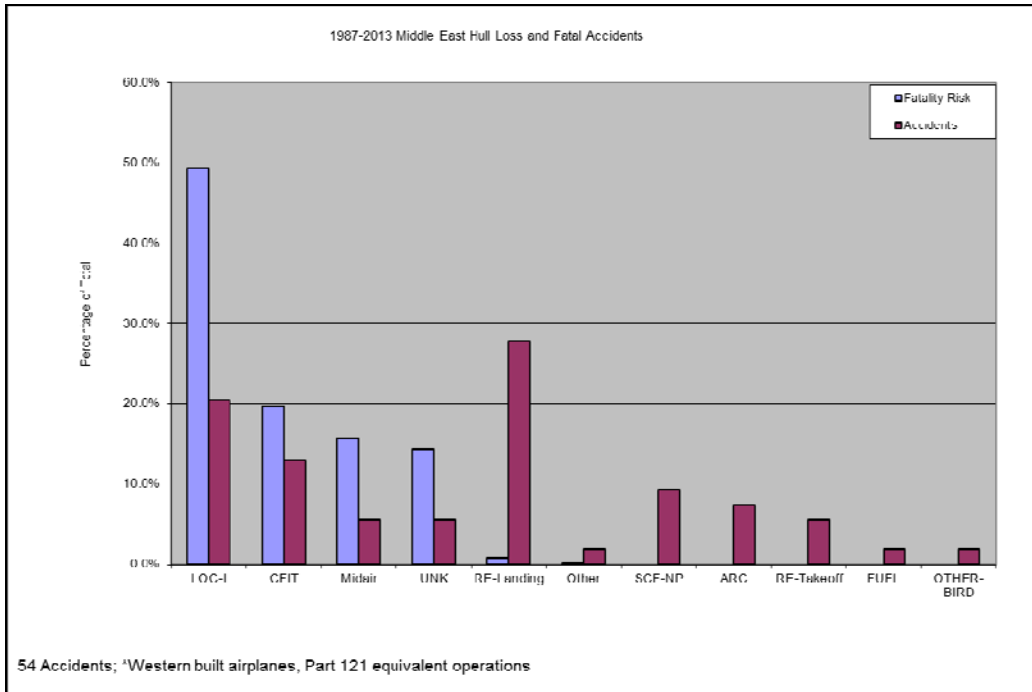
The chart below illustrated that in terms of frequency, the most frequent accidents in the MID Region for the period are:

- i. Runway Excursions (landing)
- ii. LOC-I

- iii. CFIT
- iv. Mid-air collision

In terms of fatality, the top three fatal accidents categories are:

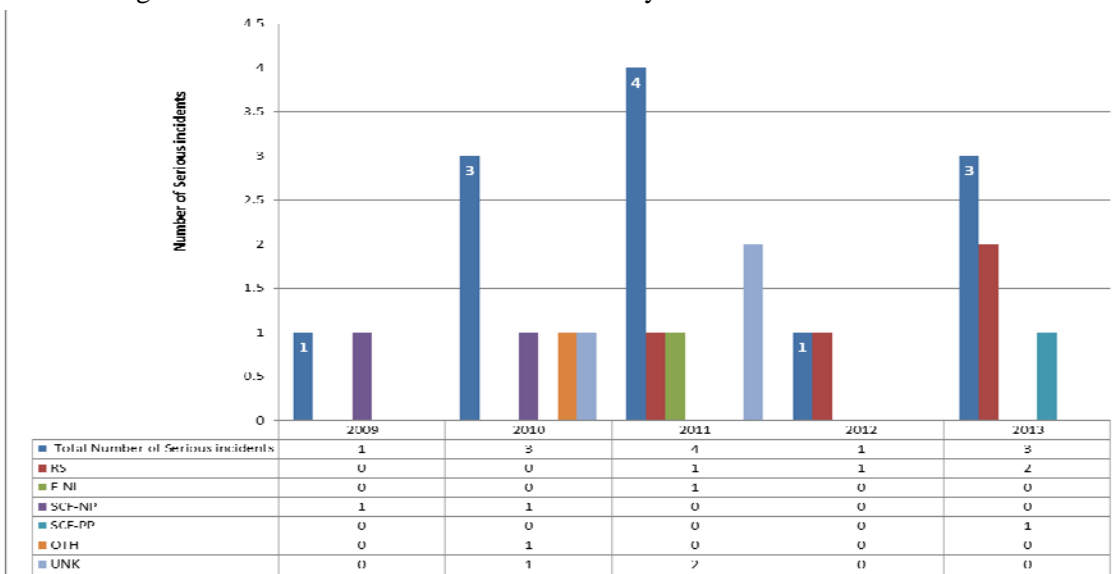
- 1. LOC-I
- 2. CFIT
- 3. Mid-air collision



3.3.2 Serious Incidents

Serious Incident is defined in ICAO Annex 13 as an incident involving circumstances indicating that an accident nearly occurred (examples of serious incidents can be found in Attachment D of ICAO Annex 13 and in the ICAO Accident/Incident Reporting Manual (ICAO Doc 9156)).

According to ICAO iSTARS (ADREP et al.), 12 Serious Incidents were reported during the period (2009-2013). The following chart shows the risk distribution for each year:



3.3.3 General Aviation

The MID Annual Safety Report Team (MID-ASRT) will be developing a section for the General Aviation in the future editions of the MID-ASR.

3.4 Identification of Focus Areas for MID Region

The identification of the Focus Areas takes into account the global priorities in addition to the regional specific needs arising from the analysis of the regional safety data provided by the different organizations (Boeing, IATA and ICAO).

It should be noted that some differences have been identified between the safety information provided by the participating organizations (Boeing, IATA and ICAO) due to the use of different criteria and classifications of accidents.

There were two discrepancies identified between ICAO and IATA data sets, as follows:

1. One accident in 2009 was classified as CFIT in ICAO data whereas IATA classified the same accident as LOC-I; and
2. IATA data shows one CFIT accident in 2012; however, this accident is not included in ICAO data since it is related to unscheduled operation (ICAO criteria is based on scheduled commercial operations).

Based on the analyses of all accident data, it is concluded that the Focus Areas for the MID Region and their priorities are unchanged:

1. Runway Safety
2. Loss of Control Inflight (LOC-I)
3. Controlled Flight into Terrain (CFIT)

The identified Focus Areas for the MID Region are in line with the Global Priorities included in ICAO Global Aviation Safety Plan (GASP).

With respect to Runway Safety, it was concluded that Runway Excursion (RE) related accident is the most frequent accident category followed by Abnormal Runway Contact (ARC) and Ground Safety.

The following are the top contributing factors for each Focus Area:

Runway Safety

- i. Errors related to Manual Handling/ Flight controls
- ii. Errors related to SOP adherence/ SOP cross verification
- iii. Unstable approach (continued landing after unstable approach)
- iv. Long/floated/bounced/firm/off-center/crabbed landing
- v. Deficiencies in Regulatory Oversight
- vi. Errors related to Crew External Communication
- vii. Overall crew performance

Loss of Control Inflight (LOC-I)

- i. Aircraft Malfunction: including Engine Failure/ Power plant Malfunction
- ii. Overall crew performance

Controlled Flight Into Terrain (CFIT)

- i. Deficiencies in Safety Management
- ii. Poor visibility/ IMC
- iii. Ground-based nav-aid malfunction or not available

In addition to the identified Focus Areas, analysis of ICAO data identified the System/Component Failure or Malfunction (SCF), as one of the emerging risks in the MID Region. This is directly related to aircraft maintenance and airworthiness of aircraft.

Based on the Boeing data (1987-2013), Mid-air collision is identified as one of the frequent (Nr. 4) and fatal (Nr. 3) accident categories in the MID Region. In addition, the analysis of the ICAO data shows that some accidents and incidents that are classified OTH are related to near miss (Airprox/TCAS Alert or Loss of Separation), which if not addressed properly could lead to mid-air collisions. Therefore, near miss is identified as an emerging risk in the Region.

3.5 MID Region Safety Performance - Safety Indicators-Reactive

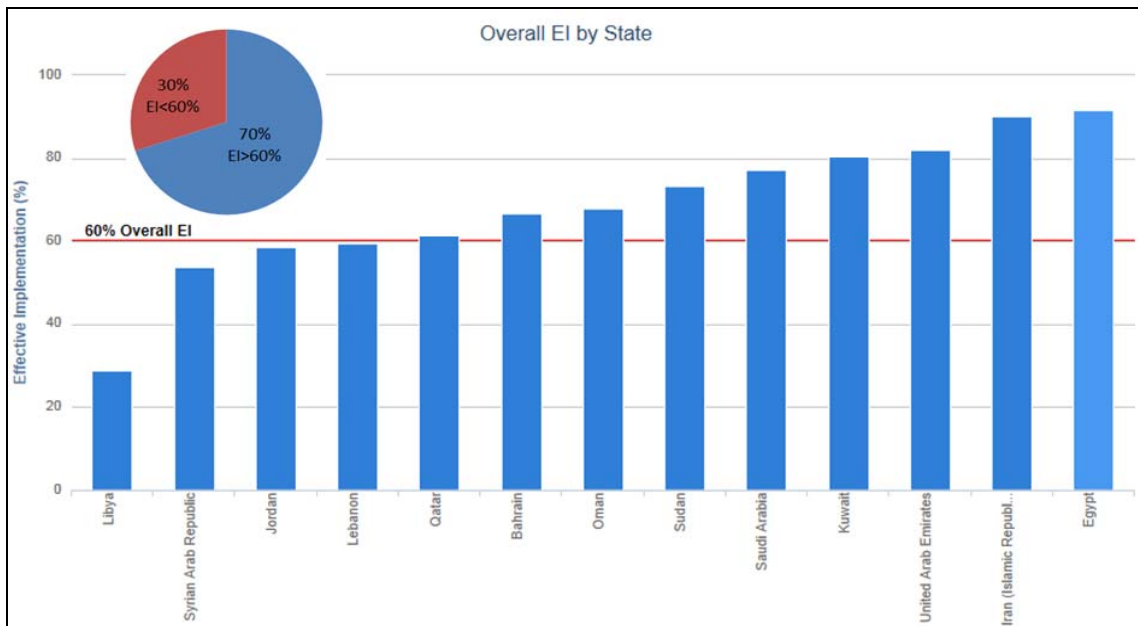
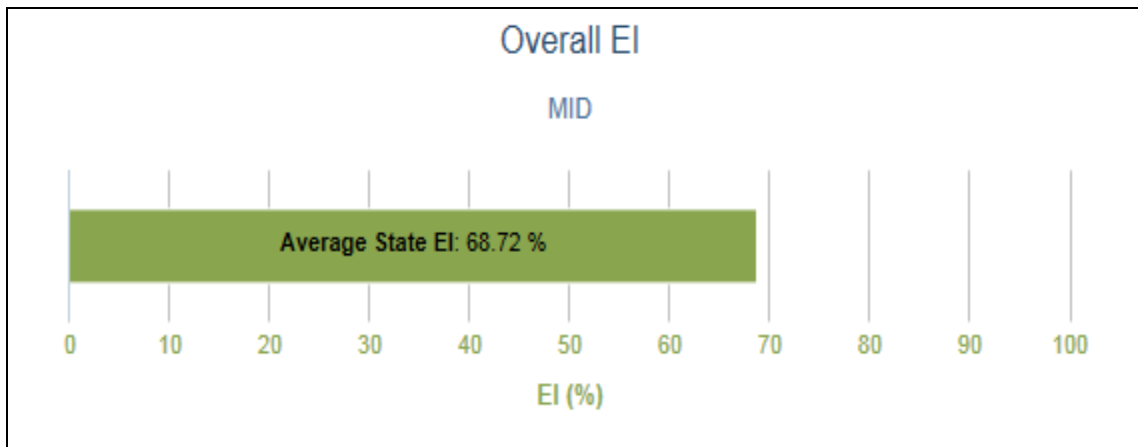
Safety Indicator	Safety Target	Global	MID	Remark
Number of accidents per million departures	Reduce the accident rate to be in line with the global average by the end of 2016	2013 (2.9) Av 2009-2013 (3.72)	2013 (3.7) Av 2009-2013 (7.28)	The MID average accident rate is almost twice the global one.
Number of fatal accidents per million departures	Reduce the rate of fatal accidents to be in line with the global average by the end of 2016.	2013 (0.29) Av 2009-2013 (0.53)	2013 (0) Av 2009-2013 (1.69)	The MID average accident rate is almost three times the global one. However, there are no fatal accidents in 2012 and 2013 in the MID Region.
Number of Runway Safety related accidents per million departures	Reduce the Runway Safety related accidents to be below the global rate by end of 2016	2013 (1.8) Av 2009-2013 (1.98)	2013 (1.8) Av 2009-2013 (3.98)	The MID average accident rate is almost twice the global one. However, in 2013 the global and MID rates are exactly the same.
Number of Runway Safety related accidents per million departures	Reduce the Runway Safety related accidents to be less than 1 accident per million departures by end of 2016		3.98 per million departures in 2013	
Number of LOC-I related accidents per million departures	Reduce the LOC-I related accidents to be below the global rate by end of 2016	2013 (0.1) Av 2009-2013 (0.08)	2013 (0) Av 2009-2013 (0.61)	The MID average accident rate is above the global one. However, in 2013 the MID rate is below the global one.
Number of CFIT related accidents per million departures	Maintain the CFIT related accidents below the global rate by end of 2016	2013 (0.1) Av 2009-2013 (0.12)	2013 (0) Av 2009-2013 (0.42)	The MID average accident rate is above the global one. However, in 2013 the MID rate is below the global one.

4. Proactive Safety Information

A mature safety management system requires the integration of reactive, proactive and predictive safety data. This section of the Annual Safety Report focuses on proactive safety data analysis to identify additional focus areas that form the basis for the development of SEIs and DIPs for Emerging Risks under RASG-MID.

4.1 ICAO USOAP-CMA

The average overall effective implementation (EI) of the audited States (13 out of 15 States have been audited) in the MID Region is 68.72%, which is above the world average 61.71 %. Since the effective launch of the Continuous Monitoring Approach in January 2013, the EI is continuously updated to reflect results from CMA activities including the ICAO Coordinated Validation Missions (ICVMs).

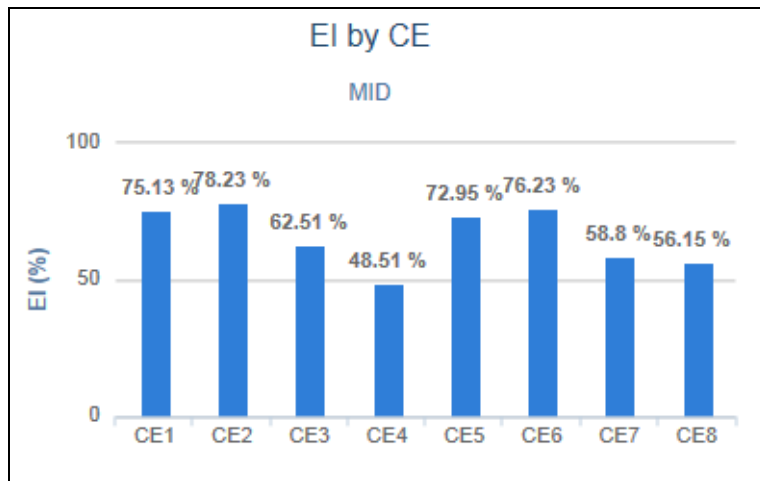


Source: ICAO-iSTARS (as of December 2014)

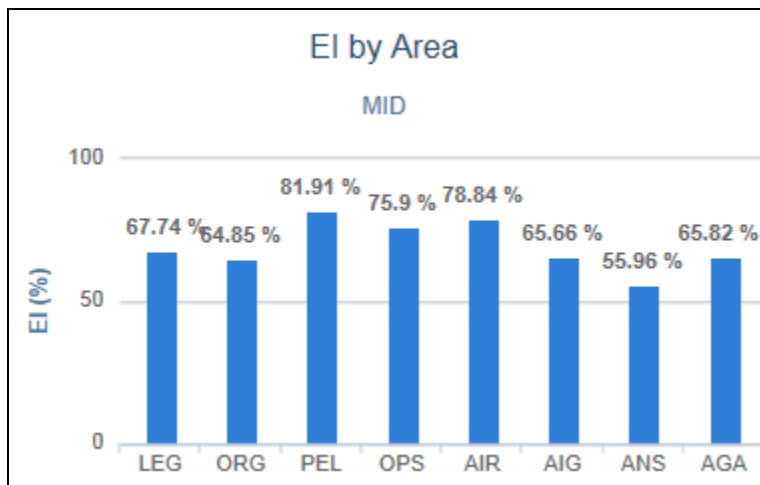
It should be noted that 9 out of 13 audited States with an overall EI over 60% include.

The results of the ICAO 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 (48.51%) 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.



Source: ICAO-iSTARS (as of December 2014)



Source: ICAO-iSTARS (as of December 2014)

4.2 IATA IOSA and ISAGO

4.2.1 IATA Operational Safety Audit (IOSA)

IOSA is an internationally recognized and accepted evaluation system designed to assess the operational management and control systems of an airline. It is worth mentioning that all MID accidents rate among non-IOSA registered operators was above the world average by an average of 8.61.

The IOSA program covers 8 areas including: Organization and Management System (ORG), Maintenance (MNT), Cargo (CGO), Security (SEC), Flight Operations (FLT), Dispatch (DSP), Cabin Safety (CAB) and Ground Handling Operations (GRH).

The IOSA audit results analysis captured under this section cover the period between February and December 2012. A summary of the IOSA audit findings is as follows:

1. 11 audits were performed in the MENA region with an average of 2.8 findings per audit.
2. Findings were mainly in the areas of Organization and Management System (ORG), Maintenance (MNT), Cargo (CGO), Security (SEC), and Flight Operations (FLT). Top non-conformances can be summarized per area as follows:

#	Area	Top findings
1	Organization & Management System (ORG)	Identification of the Accountable Executive Documentation management and control processes Contracts management processes
2	Maintenance (MNT)	Airworthiness of used parts
3	Cargo (CGO)	Dangerous goods information display
4	Security (SEC)	Corporate security policy Management and control of documentation under the security program Security training program
5	Flight Operations (FLT)	Continuing qualification training schedule Normal and non-normal procedures and maneuvers flight crew training Operator proficiency evaluation for flight crew members Wind shear avoidance and recovery flight crew training Terrain awareness and procedures flight crew training TCAS and ACAS procedures training

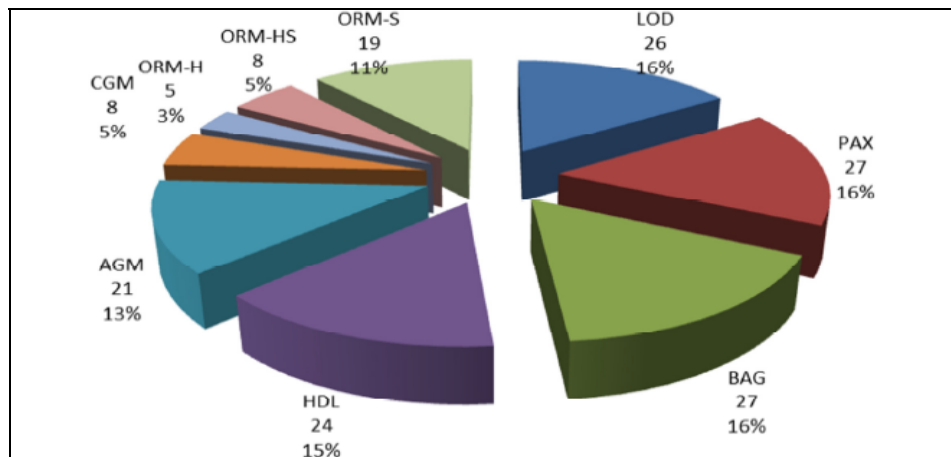
4.2.2 IATA Safety Audit for Ground Operations (ISAGO)

ISAGO implementation aims at improving ground safety and cutting the airlines’ costs by drastically reducing the ground accidents and injuries.

The ISAGO program has 9 sections including: Load control (LOD), Passenger handling (PAX), Baggage handling (BAG), Aircraft Handling & Loading (HDL), Aircraft Ground Movement (AGM), Cargo & Mail Handling (CGM), Organization & Management – Corporate (ORM-H), Organization & Management – Co-located (ORM-HS) and Organization & Management – Station (ORM-S).

The ISAGO audit results analysis captured under this section cover the period between January 2012 and July 2013. A summary of the ISAGO findings is as follows:

1. A total of 32 audit reports (5 corporate, 8 combined and 19 station) have been included in the analysis covering the IATA MENA Region.
2. Findings were mainly in the areas of Passenger handling (PAX), Baggage Handling (BAG), and Load Control (LOD). Below is a graph that illustrates the distribution of findings per area:



3. Top non-conformances per area can be summarized as follows:

#	Area	Top findings
1	Load control (LOD)	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)
2	Passenger handling (PAX)	The Provider, in accordance with requirements of the customer airline(s), handles passengers that are law enforcement officers or other persons authorized to carry weapons onboard the aircraft in the performance of their duties, the Provider shall have procedures in accordance with applicable laws and/or requirements of the customer airline(s) for the check in, handling and boarding of such passengers carrying weapons Other non-conformances were also around the Provider having procedures in place to ensure security and address any security threats upon handling passengers
3	Baggage handling (BAG)	Provider having procedures in place to ensure security and address any security threats upon handling baggage
4	Aircraft Handling & Loading (HDL)	Aircraft Handling and Servicing Operations

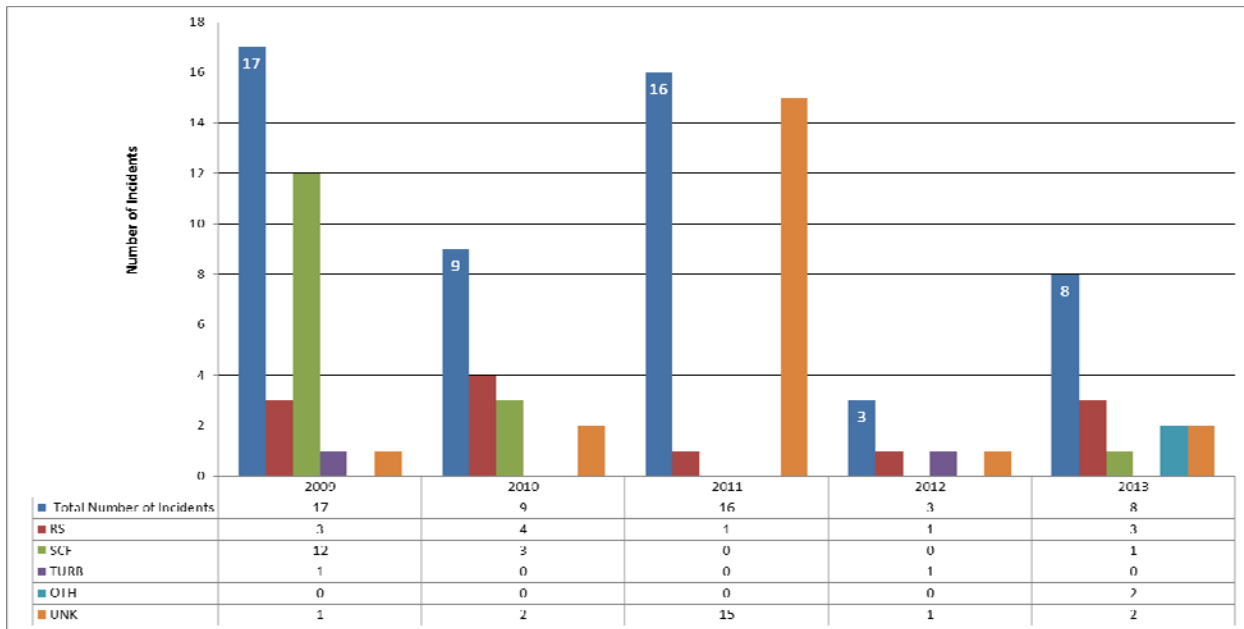
5	Aircraft Ground Movement (AGM)	Aircraft Main Gear-Controlled Pushback Operations Aircraft Powerback Operations Aircraft Ground Movement Operations
6	Cargo & Mail Handling (CGM)	Cargo/Mail Acceptance and Handling
7	Organization & Management – Corporate (ORG–H)	Aircraft Turnaround Coordination Safety & Quality Management
8	Organization & Management – Station (ORG–S)	Ground Support Equipment Management (GSE) Unit Load Device Management (ULD) Event Response

4.3 Incidents and Occurrences

4.3.1 Incidents Reported by States

Incident is defined in ICAO Annex 13 as an occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation (the type of incidents which are of main interest to the ICAO for accident prevention studies are listed in the ICAO Accident/Incident Reporting Manual (ICAO Doc 9156) and ICAO Annex 13).

According to ICAO iSTARS (ADREP et al.), 53 Incidents were reported during the period (2009-2013). The following chart shows the risk distribution for each year:



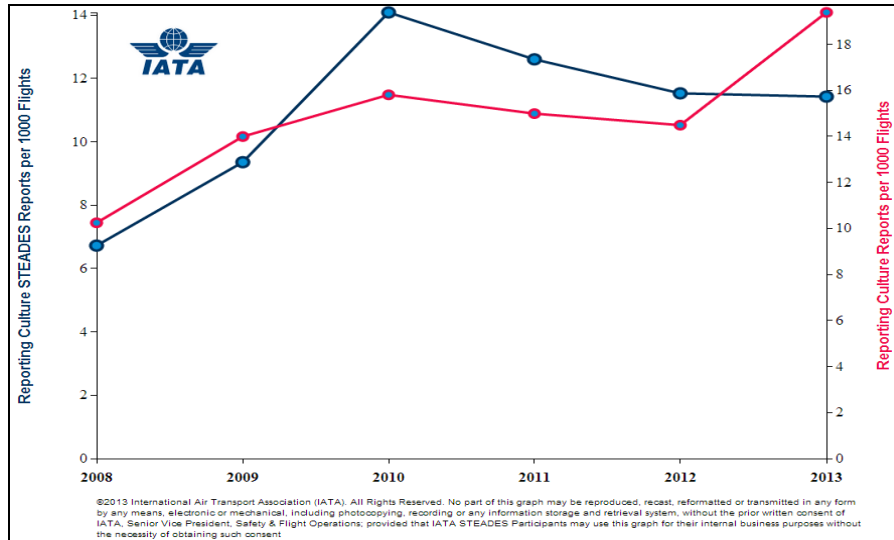
4.3.2 Incidents and Occurrences Reported by Airlines - STEADES Data

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 2008 - 2013. 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.

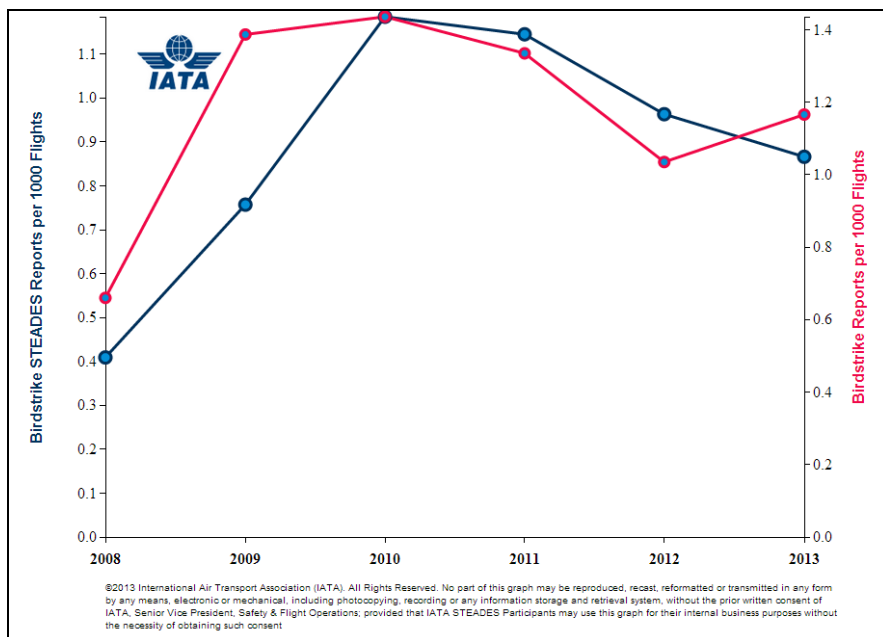
Reporting Culture

Below figure indicates a better reporting culture for the airlines in the MENA Region (in red) compared to the global rate (in blue). A significant improvement has been noticed for the year 2013.



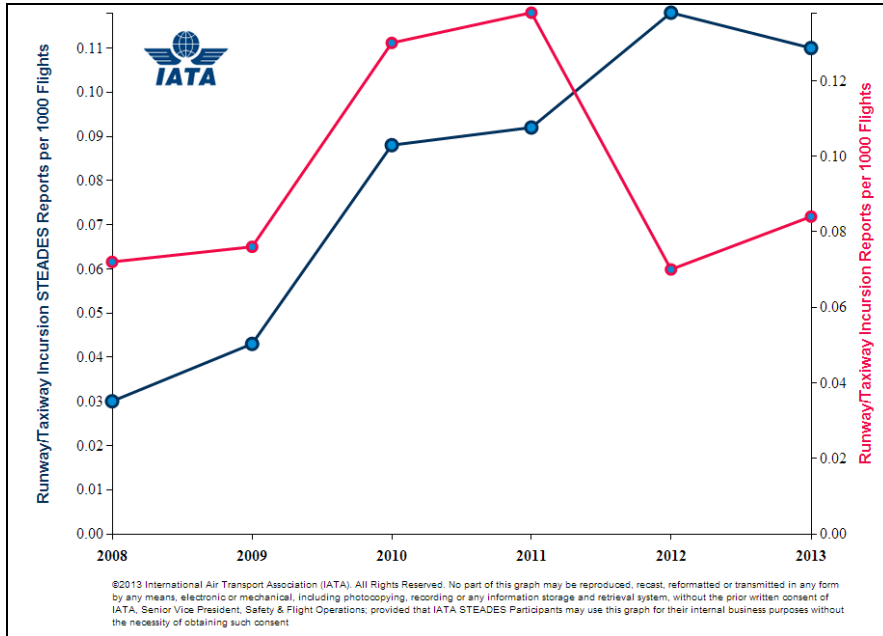
Birdstrikes

The figure below indicates a decreasing trend of birdstrikes at both regional (in red) and global (blue) levels. While the trend has been continuously decreasing at the global level, there has been a slight increase in MENA for the year 2013.



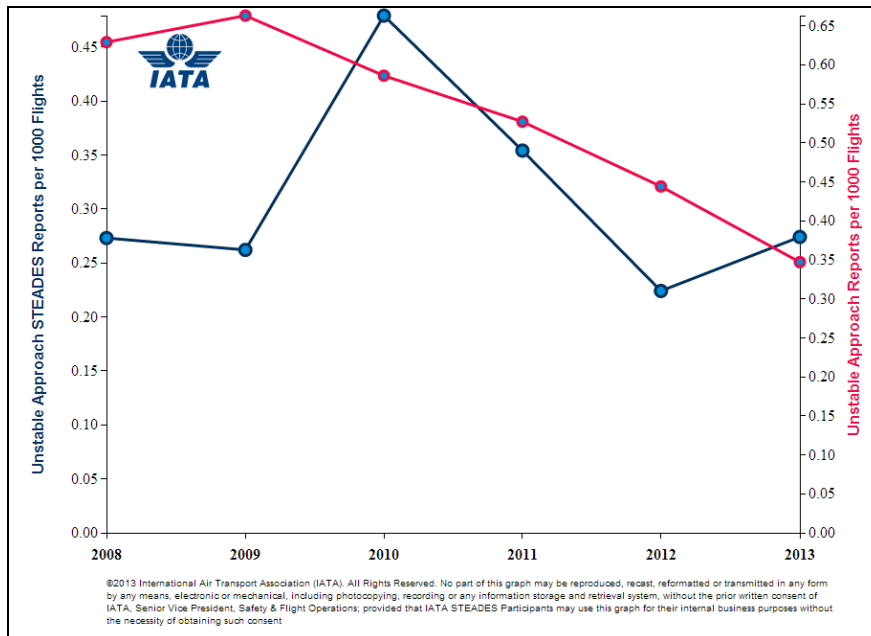
Runway/taxiway Incursions

It can be noted from the figure below that the trend of runway/taxiway incursions for the MENA Region (in red) is below the global trend (in blue). It can be also noted that as the trend is increasing at the global level, it witnessed a good decrease at the regional level after 2011.



Unstable Approaches

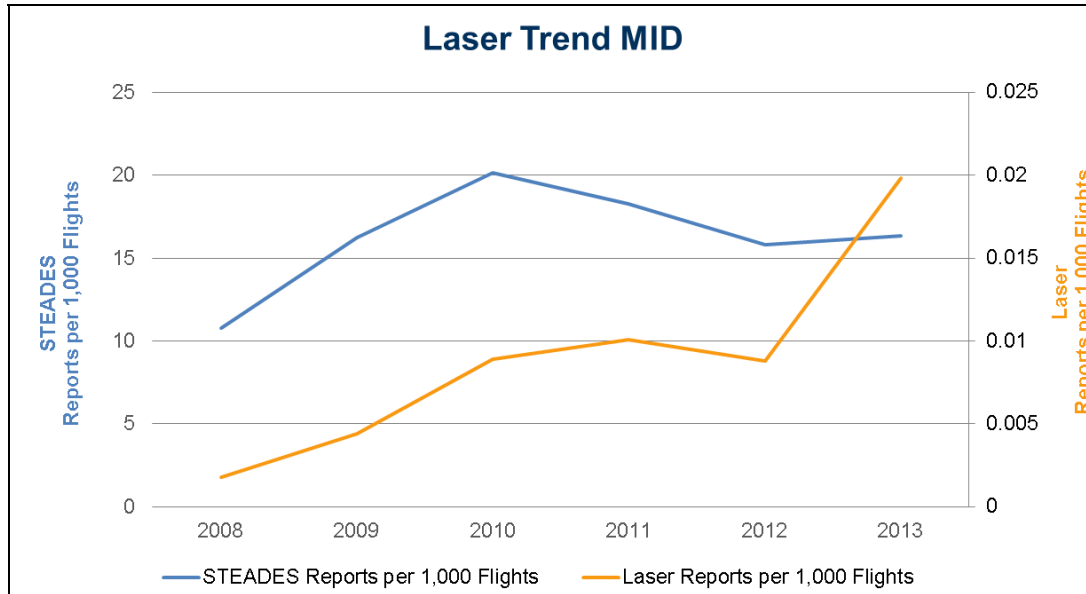
The figure below indicates a lower rate of unstable approaches for the MENA Region (in red) compared to the global level (in blue). It can be also noted that the trend of unstable approaches is continuously decreasing for the MENA Region.



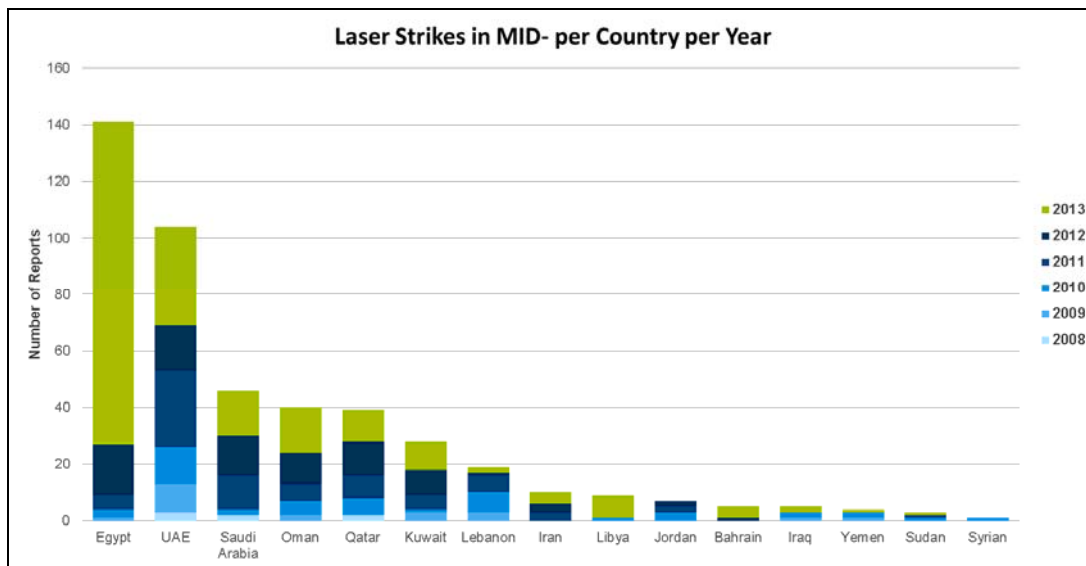
4.3.3 On Demand Analysis of Identified Emerging Risks – Laser Attacks

Following the RASG-MID/3 meeting, the risk of increasing laser attacks has been highlighted by the different States and therefore, a study was launched to assess this risk. The following data was collected from the IATA STEADES database which captures Air Safety Reports submitted by the airlines related to laser attacks.

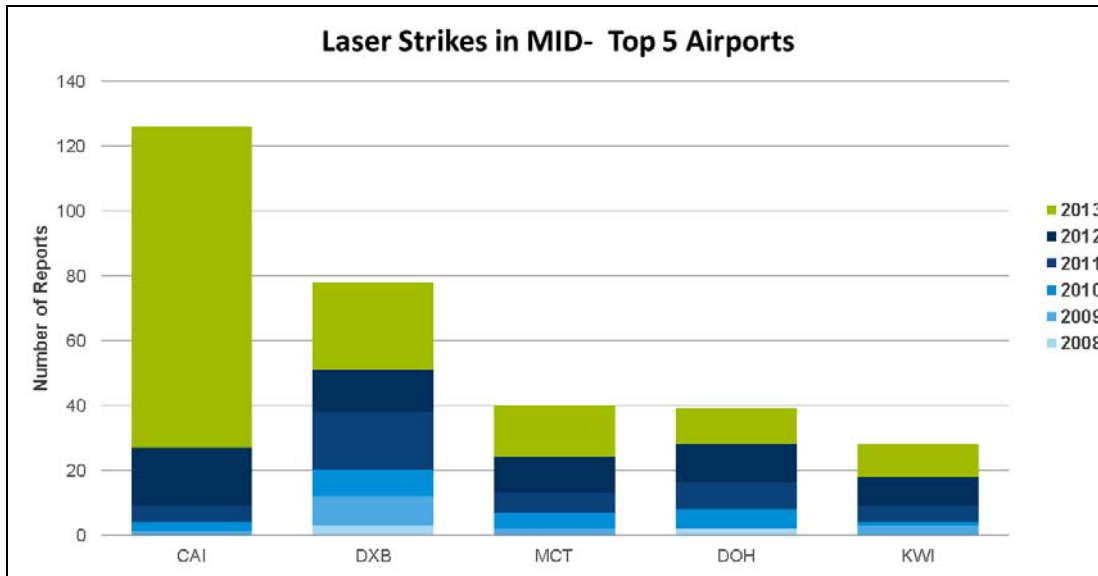
a) Trend of laser attack incidents reported in MID region (Source: IATA)



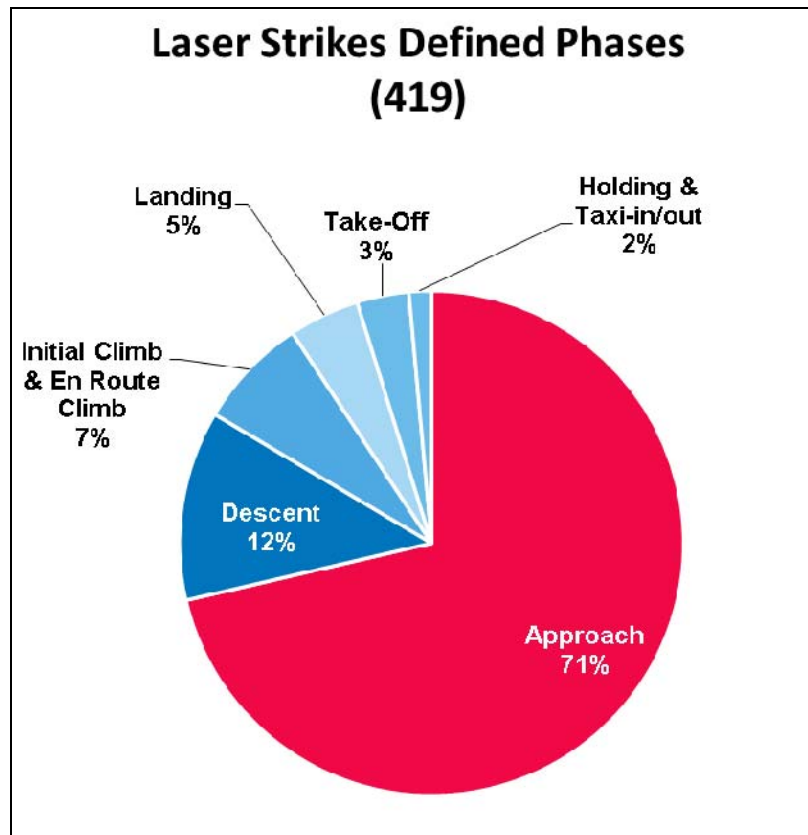
b) Laser attacks reported per MID State (Source: IATA)



c) Top five airports in which laser attacks are reported (Source: IATA)



d) Laser attacks per flight phase (Source: IATA)



A survey was also launched to collect necessary data to verify the severity of laser attacks and get necessary information from the States on any existing measures to mitigate such risk. The survey was

launched as per RASG MID (Conclusion 3/3). A questionnaire was circulated to the 15 MID States by ICAO and 7 replies were received. The following points are the main conclusions of the analysis:

1. 71% of the States agreed that laser attack incidents are of an increasing trend in their respective States.
2. 86% of the States have established a mechanism to monitor and record laser attacks on aircraft, and have published guidance material for the mitigation and prevention of such threats, yet the trend of such incidents is still increasing.
3. 57% of the States promulgated particular legislations/Regulations related to Laser attacks and violations. Remaining States do not have a legal framework which supports laser attacks mitigation strategy to prevent such violations.
4. 43% of the States indicated that no warning signs exist around the airports to address the prohibition of using laser pointers.
5. 86% of the States agreed that a more collaborative effort is necessary to counteract the emerging risk of laser attacks and the development of mitigation strategies in the MID Region.

The detailed results of the survey results will be shared with the Regional Aviation Safety Team (RAST) to develop/update required safety enhancement initiatives and detailed implementation plans. It is worth mentioning here, that there is a need to:

1. Raise the awareness among the States to keep record of the laser attack incidents reported by the different stakeholders. Voluntary reporting should be encouraged and a database should be established to keep record of such incidents.
2. Establish a guidance material for mitigating and preventing laser attack incidents. Best practices shared by the different States should be taken into account.
3. Formalize the State actions against laser attacks and violations by incorporating necessary legislations/regulations.

4.3.4. MID Region Safety Performance - Safety Indicators-Proactive

Safety Indicator	Safety Target	MID	Remark
USOAP-CMA Effective Implementation (EI) results: (a) Number of MID States with an overall EI over 60% (b) Number of MID States with an EI score less than 60% for more than 2 areas (LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA)	Progressively increase the USOAP-CMA EI scores/results: a- 11 MID States to have at least 60% EI by the end of 2015. b- All the 15 MID States to have at least 60% EI by the end of 2017. c- Max 3 MID States with an EI score less than 60% for more than 2 areas by the end of 2015.	9 States 6 States	Currently 9 States out of 13 audited States are with EI>60%.
Number of Significant Safety Concerns	a. MID 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	1 SSC	

Use of the IATA Operational Safety Audit (IOSA), to complement safety oversight activities	<ul style="list-style-type: none"> a. Maintain at least 60% of eligible MID airlines to be certified IATA-IOSA by the end of 2015 at all times b. All MID States with an EI of at least 60% accept the IATA Operational Safety Audit (IOSA) as an acceptable Means of Compliance (AMC) by 2015 to complement their safety oversight activities. 	<ul style="list-style-type: none"> a. 69% b. 2 out of 9 countries (Bahrain & Egypt) have IOSA as AMC 	<ul style="list-style-type: none"> a. This is as of 30 Sep 2014 b. Remaining countries to work with are Iran, Kuwait, Oman, Qatar, SA, Sudan, UAE
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	<ul style="list-style-type: none"> a. 75% of the Ground Handling service providers to be certified IATA-ISAGO by the end of 2017 b. The IATA Ground Handling Manual (IGOM) endorsed as a reference for ground handling safety standards by all MID States with an EI above 60% by end of 2017. 	This information is not available at the moment and will be provided in future ASR editions	
Number of certified international aerodrome as a percentage of all international aerodromes in the MID Region	<ul style="list-style-type: none"> a. 50% of the international aerodromes certified by the end of 2015 b. 75% of the international aerodromes certified by the end of 2017 	29 out of 66 (44%)	

5. Predictive Safety Information

5.1 State Safety Programme (SSP)

RASG-MID/3 meeting (Kuwait, 27-29 January 2014) agreed that effort should be put toward the establishment of a Regional Safety Oversight Organization (RSOO) to support States in the implementation of SSP in an expeditious manner in order to meet the Global and Regional Safety Targets. Accordingly, the first meeting of the MID Safety Support Team (MID-SST/1 meeting, Cairo, Egypt, 18-20 March 2014) updated the Detailed Implementation Plan (DIP) related to the establishment of an RSOO-SSP.

Based on the above, an SSP Questionnaire has been developed and sent to the MID States by the MID Regional Office in order to collect information related to the status of the SSP implementation in the MID Region, as well as, States' views regarding the establishment of an RSOO-SSP. Eleven (11) States out of the 15 MID States replied to the SSP Questionnaire.

5.2 MID Region Safety Performance – Safety Indicators – Predictive

Safety Indicator	Safety Target	MID	Remark
Number of MID States with EI>60%, having completed the SSP gap analysis on iSTARS	All MID States with EI>60% by the end of 2014.	6 out of 9 States completed the SSP gap analysis on iSTARS 1 State started the SSP gap analysis on iSTARS	<p>Currently 9 States out of 13 audited States are with EI>60%</p> <p>Data available on ICAO-iSTARS</p> <p>Data collected from States' replies to an SSP Questionnaire (11 States replied, 7 of them are with EI>60%)</p>
Number of MID States with EI>60%, that have developed an SSP implementation plan	All MID States with EI>60% by end of 2014	6 out of 9 States developed an SSP implementation plan	
Number of MID States with EI>60%, having completed implementation of SSP Phase 1.	All MID States with EI>60% to complete phase 1 by the end of 2015.	2 States completed implementation of SSP Phase 1 5 States partially completed implementation of SSP Phase 1	
Number of MID States with EI>60%, having completed implementation of SSP Phase 2.	All MID States with EI>60% to complete phase 2 by the end of 2016.	1 State completed implementation of SSP Phase 2 6 States partially completed implementation of SSP Phase 2	
Number of MID States with EI>60%, having completed implementation of SSP Phase 3.	All MID States with EI>60% to complete phase 3 by the end of 2017.	7 States partially completed implementation of SSP Phase 3	
Number of MID States with EI>60% that have established a process for acceptance of individual service providers' SMS	<ul style="list-style-type: none"> a. 30% of MID States with EI>60% by the end of 2015 b. 70% of MID States with EI>60% by the end of 2016 c. 100% of MID States with EI>60% by the end of 2017 	6 States established a process for acceptance of individual service providers' SMS	

6. Final Conclusions

Following the analysis of the reactive safety information provided by Boeing, IATA and ICAO for the period 2009 - 2013, it was concluded that the main Focus Areas for the MID Region remain the same and include Runway Safety (RS), Loss of Control In Flight (LOC-I) and Controlled Flight Into Terrain (CFIT). Major contributing factors for those accident categories include:

1. SOP Adherence/ SOP Cross verification
2. Manual Handling/ Flight Controls
3. Overall Crew Performance
4. Regulatory Oversight
5. Safety Management
6. Monitor/ Cross-check
7. Long/ floated/ bounced/ firm/ off-center/ crabbed landing
8. Unstable Approach
9. Vertical / Lateral / Speed Deviation
10. Aircraft Malfunction: Gear / Tire

In addition to the identified Focus Areas, System/Component Failure or Malfunction (SCF), which is directly linked to aircraft maintenance and airworthiness of aircraft, is considered as an emerging risk in the Region. Furthermore, near miss (Airprox/TCAS Alert or Loss of Separation) is identified as an emerging risk, which if not addressed properly could lead to mid-air collisions.

Emerging risks includes also laser attacks which has an increasing trend in the MID States. A need has been identified to promote awareness among the different States to encourage voluntary reporting and establish a database to keep record of laser attack incidents. States would also need to incorporate necessary legislations and regulations for the mitigation of the laser attacks risk.

With respect to ICAO USOAP-CMA, Critical Element (CE-4) of the State's Safety Oversight System related to Qualification and Training of Technical Staff involved in carrying out regulatory functions, still shows the lowest EI, while Areas of PEL, OPS and AIR still show the highest EI in the MID Region.

70% of the audited States in the MID Region have a USOAP-CMA EI greater than 60%. Therefore, in accordance with the GASP, these States should work on the full implementation of SSP.

It should be highlighted that reporting of incidents is still low in the MID Region, which underlines the need for regional cooperation to enhance reporting culture including the establishment of a regional database.

Additional efforts should be put in place by the Annual Safety Report Team for collecting and analysing predictive safety information. This is necessary to allow the identification and mitigation of safety concerns before accidents or incidents would even take place.

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.

Appendix A: List of Acronyms

ARC	Abnormal Runway Contact
ADRM	Aerodrome
ANSP	Air Navigation Service Provider
ATC	Air Traffic Control
ATS	Air Traffic Services
ASRT	Annual Safety Report Team
BIRD	Birdstrike
CTOL	Collisions with Obstacles during Take Off or Landing
CFIT	Controlled flight into terrain
DIP	Detailed Implementation Plan
F-IN	Fire/Smoke (Non-Impact)
FDA	Flight Data Analysis
FOQA	Flight Operations Quality Assurance
GCOL	Ground Collision
RAMP	Ground Handling
GASP	ICAO Global Aviation Safety Plan
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
LOC-G	Loss of Control - Ground
LOC-I	Loss of control - inflight
MTOW	Maximum Take-off Weight
MENA	Middle East & North Africa (IATA Region)
MID	Middle East region (ICAO Region)
RAST	Regional Aviation Safety Group
RE	Runway Excursion (departure or landing)
RI	Runway Incursion
RS	Runway Safety
SEI	Safety Enhancement Initiative
SMS	Safety Management System
SOP	Standard Operating Procedure
SSP	State Safety Programme
USOS	Undershoot/Overshoot
UAS	Undesirable Aircraft State
USOAP	Universal Safety Oversight Audit Program
WILD	Wildlife

CREDITS

The Coordinator of the MID Annual Safety Report Team (MID-ASRT), Capt. Adnan Takrouri on behalf of the Team and RASG-MID thanks all those who contributed to the elaboration of this RASG-MID Annual Safety Report and provided necessary support and information.

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