International Civil Aviation Organization

MIDANPIRG/20 and RASG-MID/10 Meeting

(Muscat, Oman, 14 - 17 May 2023)

Agenda Item 5.1: Outcomes of the ASRG

OUTCOMES OF THE ASRG/4 MEETING

(Presented by the Secretariat)

SUMMARY

This paper presents the outcome of the ASRG/4 meeting, including the 11th MID Annual Safety Report and status of achieving Safety Targets.

Action by the meeting is at paragraph 3.

REFERENCES

- ASRG/4 Report
- RASG-MID/9 Report

1. INTRODUCTION

1.1 The Fourth Virtual Meeting of the Annual Safety Report Group (ASRG/4) was held on 25 July 2022. The meeting was attended by a total of Twenty-nine (29) participants from Ten (10) States (Bahrain, Egypt, Iran, Iraq, Jordan, Oman, Qatar, Saudi Arabia, UAE and USA) and Three (3) Organizations (Boeing, IATA and IFALPA).

2. DISCUSSION

ELECTION OF CHAIRPERSONS

2.1 Mrs. Leena Ahmed Alkooheji, Chief, Airport & Air Navigation Audit, Bahrain, and Mr. Erdal Yesilbas, SSP Coordinator, Qatar, were unanimously elected as the Chairperson and Vice-Chairperson of the Annual Safety Report Group (ASRG), respectively.

11th MID-ASR

2.2 The ASRG/4 meeting finalized the Draft version of the 11th MID-ASR for final review and endorsement by the RASG-MID/10 meeting, as at **Appendix A**.

2.3 PPT/29 introduces the 11th MID Annual Safety Report and summary of safety data analysis and safety priorities for MID Region, as well as the progress of achieving the Safety Targets related to the identified Goals for MID Region Safety Performance.

2.4 Based on the analysis of the reactive and proactive safety information for the period 2017-2021, the safety priorities identified for the MID Region are:

Regional Operational Safety Risks

1. Runway Excursion (RE) and Abnormal Runway Contact (ARC) during landing;
2. Loss of Control Inflight - (LOC-I);
3. Mid Air Collision- (MAC)
4. Controlled Flight Into Terrain- (CFIT); and
5. Runway Incursion- (RI).

2.5 In addition to this, safety issues have been identified and mapped to their respective potential accident outcomes.

Organizational issues

States' Safety Oversight Capabilities

2.6 USOAP-CMA audits had identified that State's inability to effectively oversee aviation operations remains a global concern. In respect of MID Region, the regional average overall Effective Implementation (EI) (13 out of 15 States have been audited) is 74.67 %, which is above the world average 68.68 % (as of 24th May 2021). Three (3) States are currently below EI 60%.

2.7 All eight areas have an EI above 60%. However, the areas of AIG and ANS still need more improvement. Regarding the Critical Elements (CEs), CE4 (Qualified technical personnel) improved and is above 60% (62.39%) EI, whereas CE8 (resolution of safety issues) is the only one below EI 60% (58. 89%) EI.

Safety Management

2.8 States should build upon fundamental safety oversight systems to fully implement SSPs according to Annex 19; States shall require that applicable service providers under their authority implement an SMS. The average EI for SSP foundation PQs for States in the MID Region is 76, 18%.

2.9 Implementation of SSP is one of the main challenges faced by the State in the MID Region. The RASG-MID addresses the improvement of SSP implementation in the MID Region as one of the top Safety Enhancement Initiatives (SEIs). In connection with this, the RSC/7 endorsed the MID Region Safety Management Implementation Roadmap and the establishment of the Safety Management Implementation Team (SMIT) to support MID States in the implementation of the SSP. The SMIT handbook endorsed by the RASG-MID/9 to guide the work of the SMIT team to support States in an effective way.

Human Factors and Competence of Personnel

2.10 As new technologies emerge on the market and the complexity of the system continues increasing, it is of key importance to have the right competencies and adapt training methods to cope with new challenges. CRM has been identified as most important human factors issue in the domain of commercial air transport and safety actions would be identified and developed.

Cybersecurity

2.11 The global civil aviation ecosystem is accelerating towards more digitalization. This implies that any exchange of information within any digital workflow of the aviation community needs to be resilient to information security threats which have consequences on the safety of flight or the availability of airspace and beyond. Aware of the complexity of the aviation system and of the need to

manage the cybersecurity risk the MID Region needs to consider and address information security risks in a comprehensive and standardized manner across all aviation domains. In addition, it is essential that the aviation industry and civil aviation authorities share knowledge and learn from experience to ensure systems are secure from individuals/organizations with malicious intent.

Emerging Safety Risks

2.12 Emerging safety issues are risks that might impact Safety in the future, these may include a possible new technology, a potential public policy, a new concept, business model or idea that, while perhaps an outlier today, could mature and develop into a critical mainstream issue in the future or become a major trend in its own right.

- GNSS Interference
- COVID-19 Pandemic outbreak
- Ensure the Safe Operations of UAS
- Impact of Security on Safety
- 5G interference with Radio Altimeter

Sharing of Safety Information and Development of the 11th MID Annual Safety Report

2.13 The meeting reiterated the importance of sharing the number of occurrences and their safety data analysis by the States in order to produce an improved annual safety reports in the future. The meeting agreed to highlight the importance of safety reporting and safety culture in the State Letter to be circulated for the collection of safety data and information.

2.14 The main Challenges facing the MID-ASRG for the development of the ASRs, are mainly:

- lack of shared safety information, safety analysis, and safety recommendations by the States; and

- low participation in the meetings from the States and the organizations.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) review and endorse the 11th MID-ASR, at **Appendix A**, and agree to the following Draft Conclusion:

Why	To endorse the 11th ASR
What	11th ASR
Who	RASG-MID/10
When	May 2023

DRAFT RASG-MID CONCLUSION 10/XX: 11TH ASR

*That, the Eleventh MID Annual Safety Report at **Appendix A** is endorsed.*

b) urge States and stakeholders to provide the ICAO MID Office with required safety information for the development of the MID-ASRs; and support the MID-ASRG activities, and agree to the following Draft Conclusion:

Why	To produce improved annual safety reports in the future
What	Provision of the number of accidents, serious incidents and incidents, safety information, safety data analysis, and their associated safety mitigations/recommendations
Who	States
When	30 April 2023

DRAFT RASG-MID CONCLUSION 10/XX: SHARING OF SAFETY DATA ANALYSIS

*That, in order to present an improved version of the 12th MID-ASR to the MID-ASRG/5 meeting, States, be urged to provide the ICAO MID Office by **30 April 2023** with the number of accidents, serious incidents and incidents, safety data analysis/information, and their associated safety recommendations in **Appendix B** for the past 5 years (2018 – 2022) and using the template in **Appendix C**.*

ICAO

SAFETY

MID Region Annual Safety Report

11th Edition 2022

Reference Period (2017 - 2021)

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Contents

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 the achievement of the Safety Targets in the MID Region Safety Strategy. The RASG-MID membership includes representatives from ICAO, MID States, and international organizations.

RASG-MID consists of four main teams: The Annual Safety Report Group (ASRG), the Aerodrome Safety planning and Implementation Group (ASPIG), the Safety Enhancement Implementation Group (SEIG), the Accident and Incident Investigation Group (AIIG). The Annual Safety Report Group (ASRG) is in charge of collecting and analysing safety information. The Group is also responsible for the identification of the main safety risks, MID Region safety priorties and the production of the RASG-MID Annual Safety Report (ASR).

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.

Executive Summary

The COVID-19 pandemic has battered world-wide aviation in a way that could never have been imagined and we are still trying to assess the full extent of the impact that it will have on civil aviation in the longer term. While the pandemic is not yet over, there are signs at last that vaccination offers a viable way to reduce levels of infection and a basis to realistically plan for a full reopening. Throughout the pandemic, the ICAO MID Office has continued to work collaboratively with all stakeholders to ensure that the industry is equipped to resume the flight operations.
In addition, the MID-RPTF mechanisms continued to serve as a platform for coordination and cooperation amongst all stakeholders to support States with the implementation of the CART and HLCC recommendations as well as the recovery of aviation industry in the MID Region during the COVID-19 pandemic outbreak.

Over the last five years, the global scheduled commercial international operations accounted for approximately 24.96 million departures in 2021, compared to 36.3 million departures in 2017. The MID Region shows a decrease in traffic volumes during 2021. Total scheduled commercial departures in 2021 accounted for approximately 806,274 estimated departures compared to 1.37 million departures in 2017. In terms of an aircraft accident, the MID Region had no accident during the year 2021. The 5-year average accident rate for 2017-2021 is 2.21, which is slightly below the global average rate (2.41) for the same period The MID Region accident rate in 2020 is higher than the global accident rate, which is 2.14 accidents per million departures.

The MID Region had no fatal accident in 2021. However, the 5-year average fatal accident rate for 2017-2021 is 0.42, which is almost similar to the global average rate (0.41) for the same period.The MID Region had no fatal accidents in 2017, 2019, and 2021. However, two fatal accidents occurred in 2018 and 2020. The 2018 accident caused 66 fatalities and the year 2020 caused 176 fatalities.

MID Region Safety Priorities

One of the GASP goals is for States to improve their effective safety oversight capabilities and to progress in the implementation of SSPs. Thus, GASP calls for States to put in place robust and sustainable safety oversight systems that should progressively evolve into more sophisticated means of managing Safety. In addition to addressing organizational issues, GASP addresses high-risk categories of occurrences, which are deemed global safety priorities. Therefore, Regional operational safety risks, organizational issues, and emerging risks are defined to support and improve the development of Safety Enhancement Initiatives (SEIs) detailed in the MID Region Aviation Safety Plan (MID-RASP 2020-2022 Edition).

Furthermore, the MID-RASP 2020-2022 Edition considers and supports the objectives and priorities of GASP 2020-2022 Edition. MID-RASP also emphasizes the importance of identifying and mitigating risks at MID Region level. In addition, MID-RASP is to create a common focus on Regional aviation safety issues as a continuation of the MID Region work to improve aviation safety and to comply with ICAO standards and supports MID States and industry in implementing the GASP 2020-2022 Edition.

The Eighth meeting of the Regional Aviation Safety Group – Middle East (RASG-MID/8) was held in Cairo, Egypt, Virtual Meetings, 15-22 February 2021; endorsed the MID-RASP 2020-2022 Edition including the SEIs list and their respective actions through RASG-MID CONCLUSION 8/3. In addition, the RASG-MID/9 noted with appreciation the updated SEIs and their respective safety actions as well as the status of their implementation.

Therefore, to address organizational challenges/issues, Regional operational risks, and emerging risks, 17 SEIs and 51 safety actions have been included in the MID-RASP.

A. Regional Operational Safety Risks

Operational safety risks arise during the delivery of a service or the conduct of an activity (e.g., operation of an aircraft, airports, or air traffic control). Based on the analyses of reactive and proactive safety information, it is concluded that the Regional operational safety risks for the MID Region are:

1. Loss of Control-In Flight (LOC-I);
2. RE and ARC during landing;
3. Mid-Air Collision (MAC);
4. Controlled Flight into Terrain (CFIT); and
5. Runway incursion (RI)

In addition to this, safety issues have been identified and mapped to their respective potential accident outcomes.

B. Organizational issues

Organizational issues are systemic issues which take into consideration the impact of organizational culture, and policies and procedures on the effectiveness of safety risk controls.

1. States' Safety Oversight Capabilities

USOAP-CMA audits had identified that State's inability to effectively oversee aviation operations remains a global concern. In respect of MID Region, the Regional average overall Effective Implementation (EI) (13 out of 15 States have been audited) is 74,67 %, which is above the world average 68.68 % (as of 29 May 2022). Three (3) States are currently below EI 60%.

All eight areas have an EI above 60%. However, the areas of AIG and ANS still need more improvement. Regarding the Critical Elements (CEs), CE4 (Qualified technical personnel) improved and is above 60% (62.39%) EI, whereas CE8 (resolution of safety issues) is the only one below EI 60% (58. 89%) EI.

Moreover, the effective implementation in certification, surveillance, and resolution of Safety concerns need to be improved.

2. Safety Management

States should build upon fundamental safety oversight systems to fully implement SSPs according to Annex 19; States shall require that applicable service providers under their authority implement an SMS. The average EI for SSP foundation PQs for States in the MID Region is 76, 18%.

An SSP requires increased collaboration across operational domains to identify hazards and manage risks. Aviation authorities and organizations should anticipate new emerging threats and associated challenges by developing SRM principles. Implementation of SSP is one of the main challenges faced by the State in the MID Region. The RASG-MID addresses the improvement of SSP implementation in the MID Region as one of the top Safety Enhancement Initiatives (SEIs). In connection with this, the RASG-MID/9 endorsed the Safety Management Implementation Team (SMIT) handbook to support MID States in the implementation of the SSP in an effective and efficient way. Moreover, the RASG-MID also supported the establishment and activation of the MENA RSOO, with a primary objective to

assist member States to develop and implement SSP; and Several Safety Management Workshops, training courses, and meetings have been organized to support the implementation of SSP/SMS and address the challenges and difficulties, as well as sharing of experiences and best practices.

3. Human Factors and Competence of Personnel

As new technologies emerge on the market and the complexity of the system continues increasing, it is of key importance to have the right competencies and adapt training methods to cope with new challenges. CRM has been identified as most important human factors issue in the domain of commercial air transport and safety actions would be identified and developed.

4. Cybersecurity

The global civil aviation ecosystem is accelerating towards more digitalisation. This implies that any exchange of information within any digital workflow of the aviation community needs to be resilient to information security threats which have consequences on the safety of flight or the availability of airspace and beyond. Aware of the complexity of the aviation system and of the need to manage the cybersecurity risk the MID Region needs to consider and address information security risks in a comprehensive and standardised manner across all aviation domains. In addition, it is essential that the aviation industry and civil aviation authorities share knowledge and learn from experience to ensure systems are secure from individuals/organisations with malicious intent.

C. Emerging Safety Risks

Emerging safety issues are risks that might impact safety in the future. These may include a possible new technology, a potential public policy, a new concept, a business model or idea that, while perhaps an outlier today, could mature and develop into a critical mainstream issue in the future or become a major trend in its own right.

1. GNSS interference

GNSS/GPS vulnerability, including intentional and unintentional signal interference, has been identified as a major safety issue.

Flight Data Exchange anlaysis showed that the majority of GPS Signal Lost was detected within or in vicinity of Turkish airspace (Ankara FIR and Istanbul FIR), and in Eastern Mediterranean area. Compared to previous analysis, the identified hot spots have been expanded into entire Anatolian peninsula, including Istanbul FIR (LTBB).

2. COVID-19 Pandemic Outbreak

The MID-RPTF mechanisms continued to serve as a platform for coordination and cooperation amongst all stakeholders to support States with the implementation of the CART and HLCC recommendations as well as the recovery of aviation industry in the MID Region during the COVID-19 pandemic outbreak.

The revised MID RPTF Term Of reference (TORs) has been endorsed by the 4th Virtual DGCA meeting. The MID RPTF framework was established to include 4 technical work streams namely: Public Health Requirements, Operational Safety Measures, Avaition security and Facilitation, and Air Navigation Services/Air Traffic Management. Each work stream identifies its key activities and their respective actions and deliverables/outcomes to be presented to the MID TPTF meetings.

The MID RPTF composition includes the Chairpersons of MIDANPIRG, RASG-MID, MID-RASFG and CAPSCA-MID; States representatives; States CRRIC Focal points; Representatives from the Regional and International Organizations (AACO, ACAO, ACI, CANSO, IATA, ICAO, IFALPA, and IFATCA); and Operators, and/or Service Providers may be invited to participate in the MID RPTF meetings, as required.

The MID-RPTF contributed to the development and would also continue to foster and support the implementation of MID CART implementation plan and associated MID Regional Groups CART implementation plans of actions.

iPacks are developed and implemented in full alignment with the measures and recommendations contained in the CART Report. Thus, The National Aviation Safety Plan (NASP) and Unmanned Aircrfat Systems (UAS) iPacks are being deployed to support States in the MID Region.

3. Ensure the Safe Operations of UAS (drones)

The number of drones at the global level has increased. Available evidence demonstrates an increase of drones coming into close proximity with manned aviation (both aeroplanes and helicopters) and the need to mitigate the associated risk. The civil aviation authority is responsible for, inter alia, ensuring aviation safety and protecting the public from aviation hazards. However, additional safety data and safety information are needed for further analysis to identify the underlying safety issues.

4. Impact of Security on Safety

The crash of flight MH17 immediately raised the question why the aero plane was flying over an area where there was an ongoing armed conflict. Similar event had occurred in the MID Region involving the Ukraine International Airlines Flight 752 (PS752) beginning of the year 2020.

5. 5G interference with Radio Altimeter

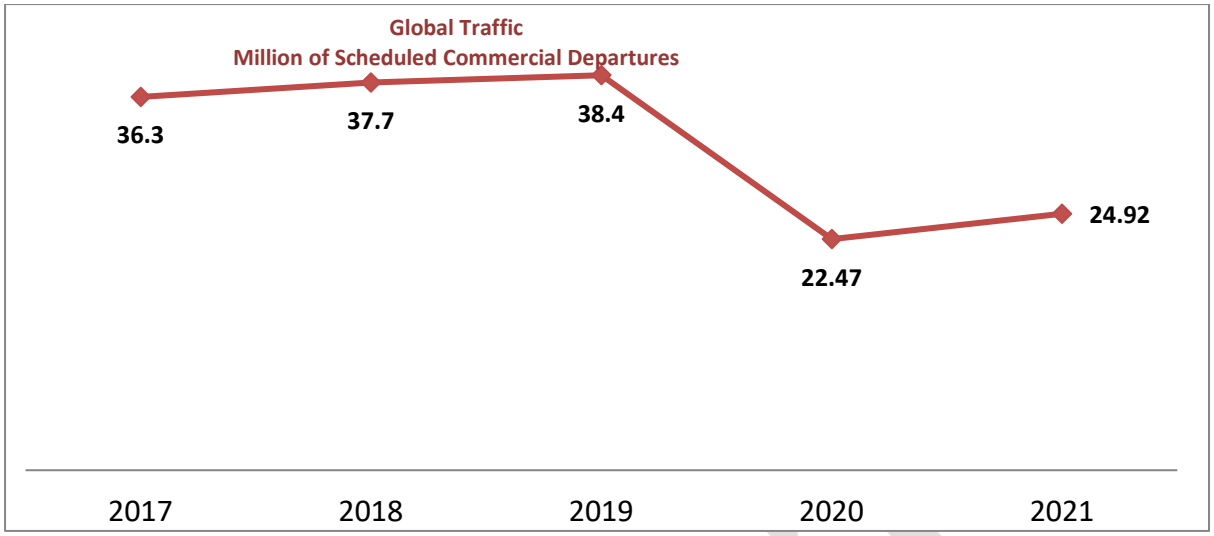
Radar altimeters (RA), operating at 4.2-4.4 GHz, are the only sensors onboard a civil aircraft which provide a direct measurement of the clearance height of the aircraft over the terrain or other obstacles (i.e. the Above Ground Level - AGL - information).

There is a major risk that 5G telecommunications systems in the 3.7–3.98 GHz band will cause harmful interference to radar altimeters on all types of civil aircraft- including commercial transport airplanes; business, regional, and general aviation airplanes; and both transport and general aviation helicopters. If there is no proper mitigation, this risk has the potential for broad impacts to aviation operations in the United States as well as in other regions where the 5G network is being implemented next to the 4.2-4.4 GHz frequency band.

1. Traffic Volumes

1.1 Global Traffic

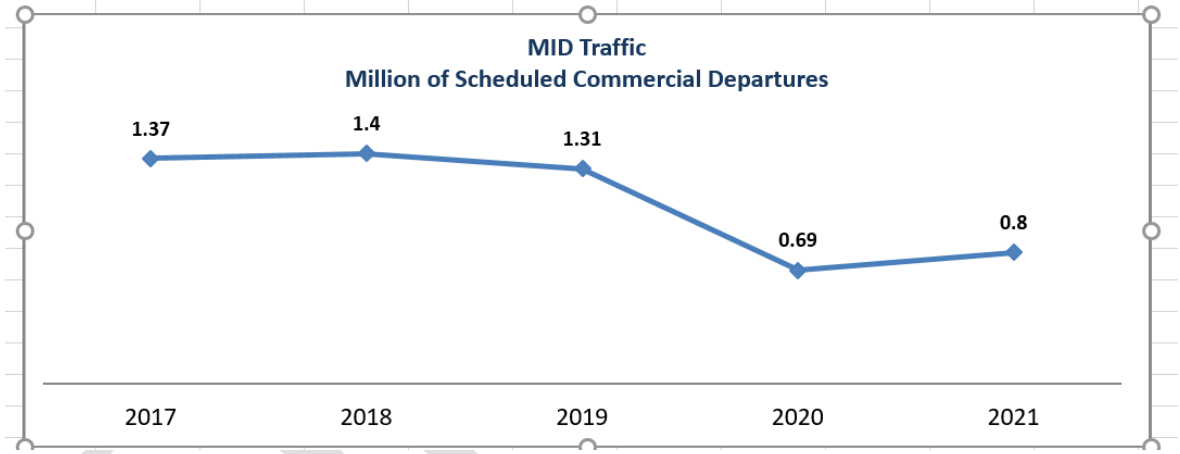
The global scheduled commercial international operations accounted for approximately 24.92 million departures in 2021, compared to 36.3 million departures in 2017; which showed a high decrease.



Graph 1: Global Traffic Volume (Source ICAO Safety Report 2022)

1.2 MID Traffic

The MID Region shows a high decrease in traffic volumes during 2021. Total scheduled commercial departures in 2021 accounted for approximately 806,274 estimated departures compared to 1.37 million departures in 2017.



Graph 2: MID Traffic Growth (Source ICAO Safety Report 2022)

2. Reactive Safety Information

2.1 Safety Risk Assessment Methodology

To facilitate the identification and prioritization of the main Regional Safety Operational Risks, accidents are categorized in terms of frequency and severity and the serious incidents in terms of frequency. The severity assessment is based on fatalities, injuries, and damage to aircraft, property, and equipment. (For Frequency rating: 1 is the most frequent, and six is the least frequent. For Severity: 1 is the most severe and four is the least severe)

The MID ASRT/2 meeting (Cairo, Egypt, 4-5 February 2018) agreed to the following improvements to the methodology used for risk assessment:

a) improvement of the current risk matrix used for the identification of Regional operational risks (four (4) levels of severity instead of three (3)), as follows:

improvement of the current risk matrix used for the identification of focus areas (four (4) levels of severity instead of three (3)), 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 (minor injuries, minor damage to aircraft);
4) No potential damage or injury

Frequency / Severity	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
4	4	8	12	16	20	24

Table 1 Risk matrix

b) Adoption of the "feared consequences" of the risk portfolio of DGAC France:

Table 2 below shows that each identified Undesirable event/safety issue is linked to the potential accident outcome.

NB	Identification of Undesirable Event	Potential Accident outcome						
		CFIT	LOC-I	MAC	Ground Collision	RE	Damage to aircraft or injury inflight	Damage to aircraft or /injury on ground
UE.1	Unstabilised or non-compliant approach	X	X			X		X
UE.2	Abnormal airplane attitude (Roll, pitch, speed…)		X				X	
UE.3	Events relating to aerodrome conditions (Runway surface condition and aerological parameters)		X			X	X	X
UE.4	En-route encounter of dangerous weather phenomena (Thunderstorm, turbulence, Icing)		X	#			X	X
UE.5	Misuse of aircraft system (Weight and Balance, speed track, aircraft config)	X	X	X	X	X	X	X
UE.6	Event pertaining to works/maintenance operations on or close to a runway		#		X	X		X
UE.7	Bad coordination/execution of ground operations (deicing, loading, stowing, line maintenance, etc)	X	X		X		X	X
UE.8	Runway/taxiway incursion				X	X		X
UE.9	Loss of separation in flight/ and/or		X			X	X	X

	airspace infringement /level bust							
UE.10	Wildlife hazard, including bird strike		X		X	X	X	
UE.11	Ground-onboard interface failure (Misunderstanding, unsuitability of transmitted information,etc)	X	X	X	X	X	X	X
UE.12	Aircraft maintenance event	X	X		#	X	X	X
UE-13	Fire/Smoke inflight	#	X				X	X
UE-14	Aircraft system failure resulting in flight management disturbance	X	X			X	X	X
UE-15	Loss of cabin pressure		X	#			X	
UE-16	Aircraft damage due to FOD		X			X	X	X

Table:2 identified Undesirable event/safety issue

2.2 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 applications used for the development of the ICAO Safety Reports. In addition, Occurrence Validation Study Group (OVSG) final validation accidents data is also used as source of the data analysis.

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 (validated or under validation by ICAO). Serious incidents presented here are safety information shared by the MID States.*

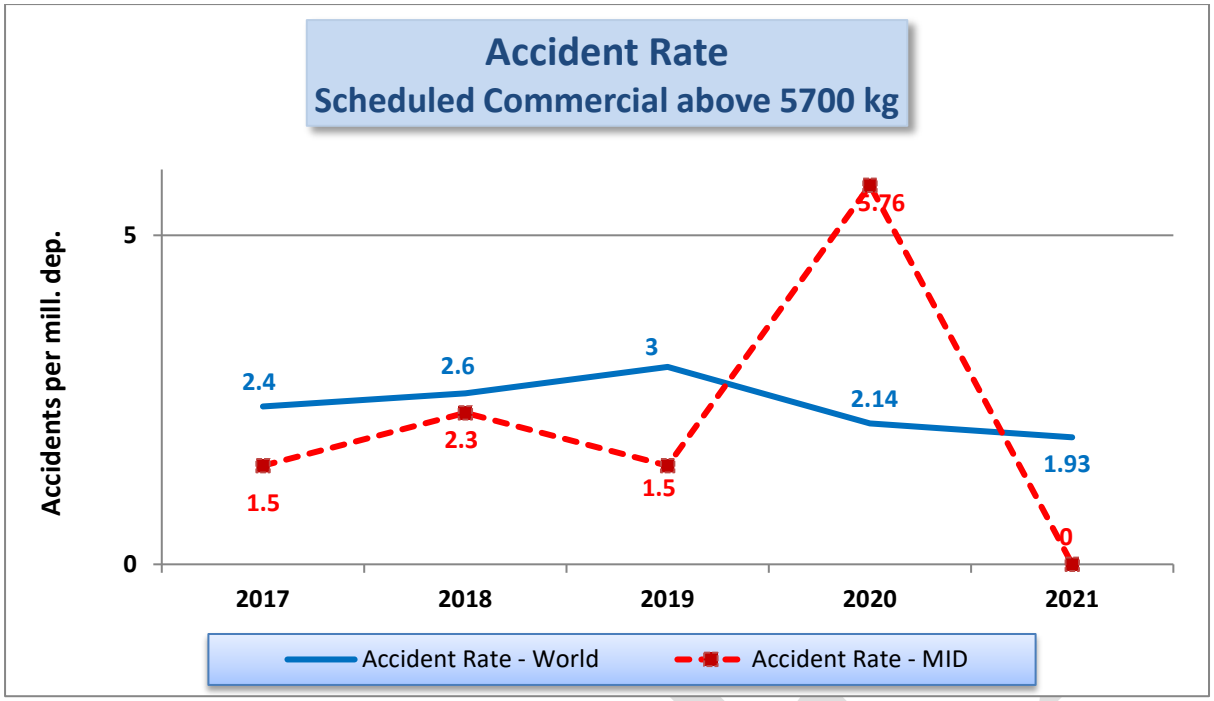
The main part of this section provides an analysis of the accidents that occurred in the MID Region (State of Occurrence) for the period (2017-2021), which is used for monitoring the progress of achieving the Safety Targets in the MID Region Safety Strategy.

Besides, it provides data analysis regarding accidents 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. It is to be highlighted that the State of registry and State of the operator Section focuses mainly on counts and percent distribution (no rates).

2.2.1 MID State of Occurrence

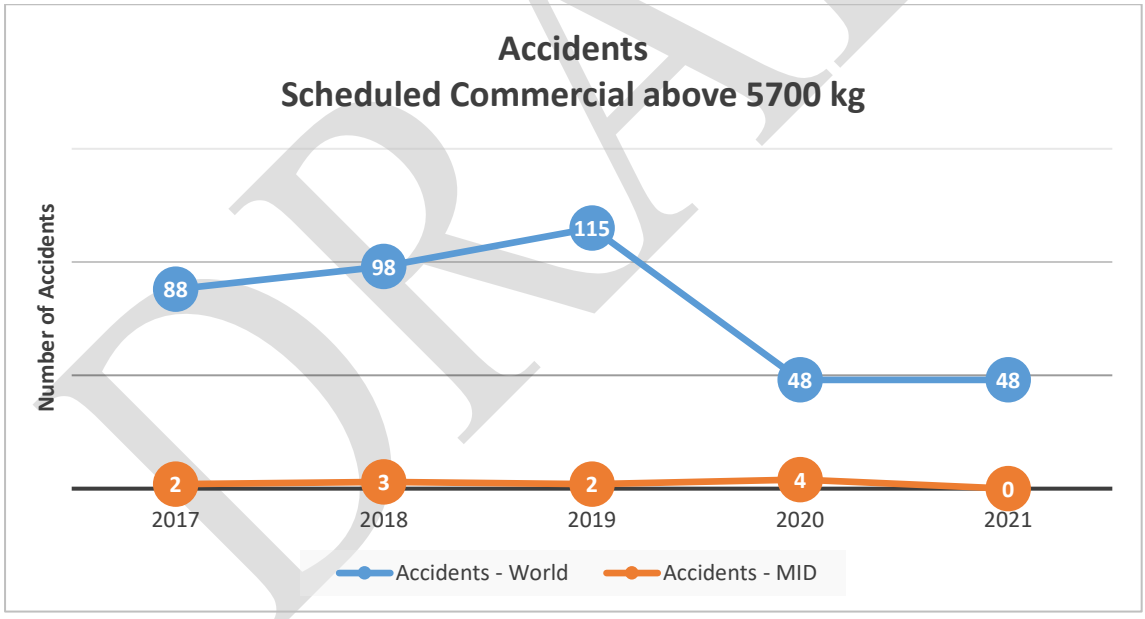
2.2.1.1 Accidents Rates and Fatalities

Graph 3 shows that the MID Region had no accidents in 2021, which decreased compared to the previous year (2020). The 5-year average accident rate for 2017-2021 is 2.21, which is slightly below the global average rate (2.41) for the same period.



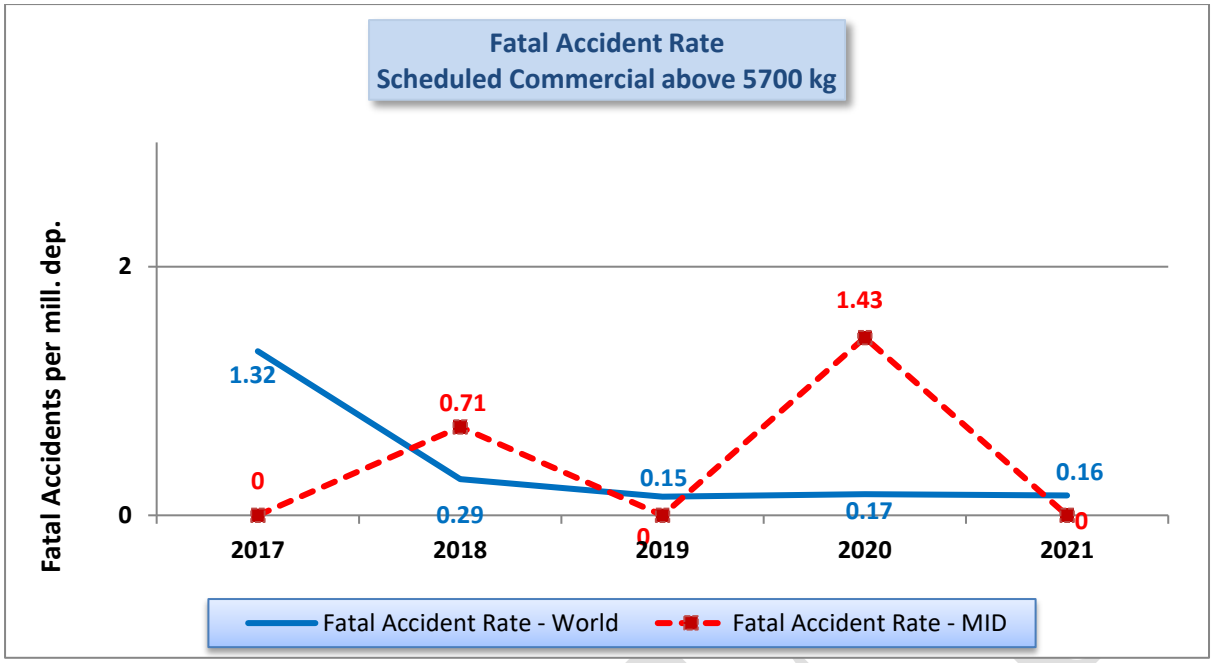
Graph 3: Global Accident Rate Vs. MID Accident Rate (Source OVSG Data& ICAO ASR 2022)

Graph 4 shows that 11 accidents occurred in the MID Region during the period (2017-2021), whereas (397) accidents occurred globally.

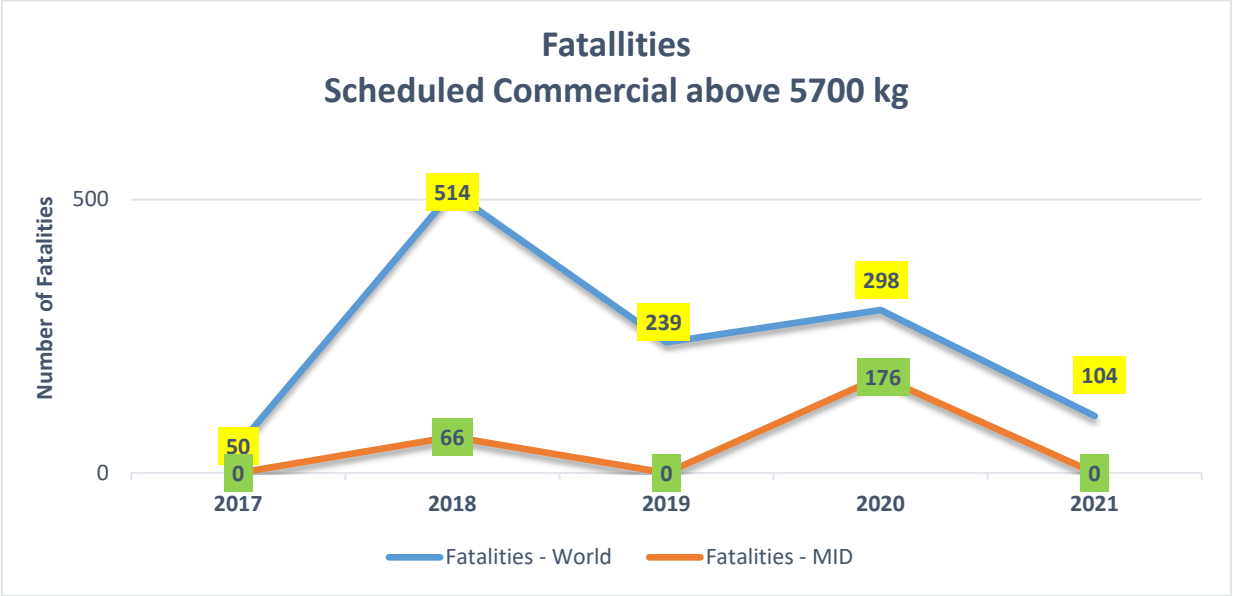


Graph 4: Number of MID Accidents Vs. Number of Global Accidents Per Year (Source OVSG Data& ICAO ASR 2022)

Graph 5 shows that the MID Region had no fatal accident in 2021. However, the 5-year average fatal accident rate for 2017-2021 is 0.42, which is almost similar to the global average rate (0.41) for the same period. The MID Region had no fatal accidents in 2017, 2019, and 2021. However, two fatal accidents occurred in 2018 and 2020. The 2018 accident caused 66 fatalities and the year 2020 caused 176 fatalities, as shown in Graph 6.

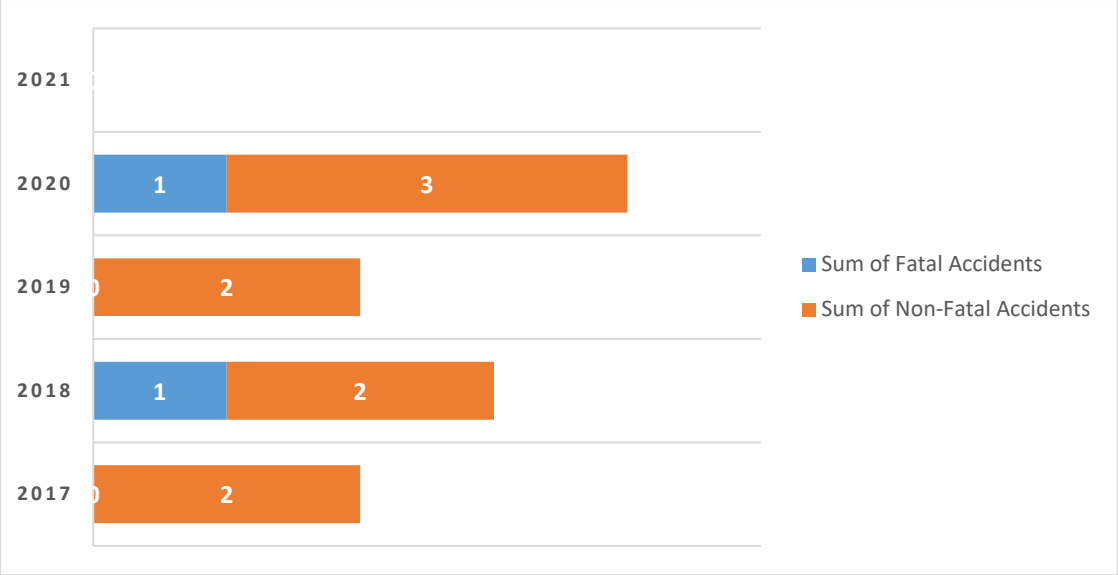


Graph 5: Global Fatal Accident Rate Vs. MID Fatal Accident Rate (Source OVSG Data& ICAO ASR 2022)



Graph 6: Number of MID Fatalities Vs. Global Fatalities (Source OVSG Data& ICAO ASR 2022)

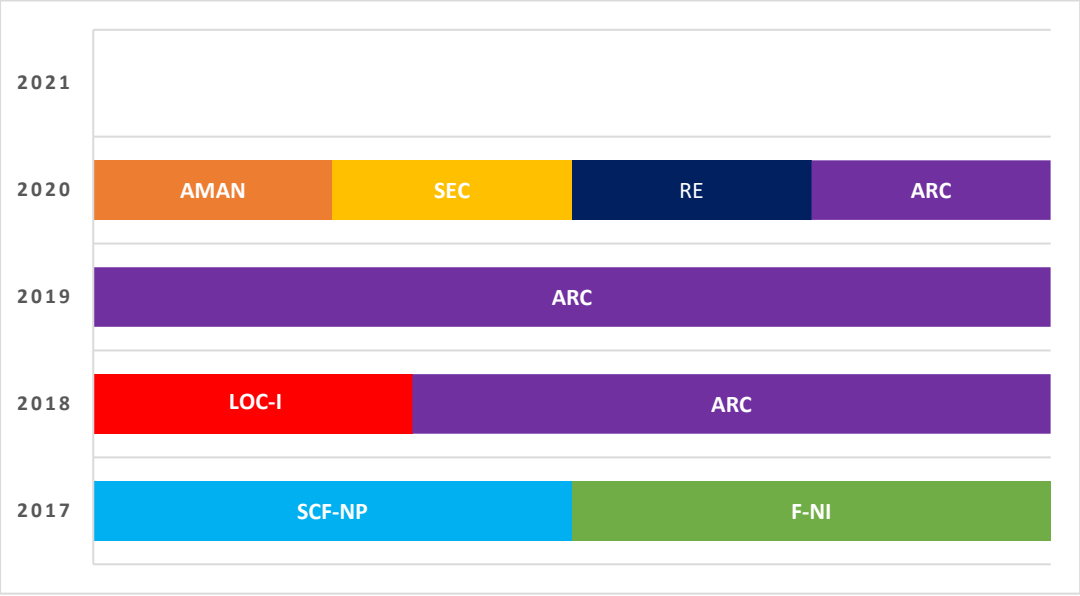
Graph 7 shows that 11 accidents occurred between 2017 and 2021. Two fatal accidents occurred respectively during 2018 and 2020.



Graph 7: Number of Fatal Accidents Vs. Non-Fatal Accidents Per Year (2017-2021) (Source OVSG Data& ICAO ASR 2022)

2.2.1.2 Occurrence Category

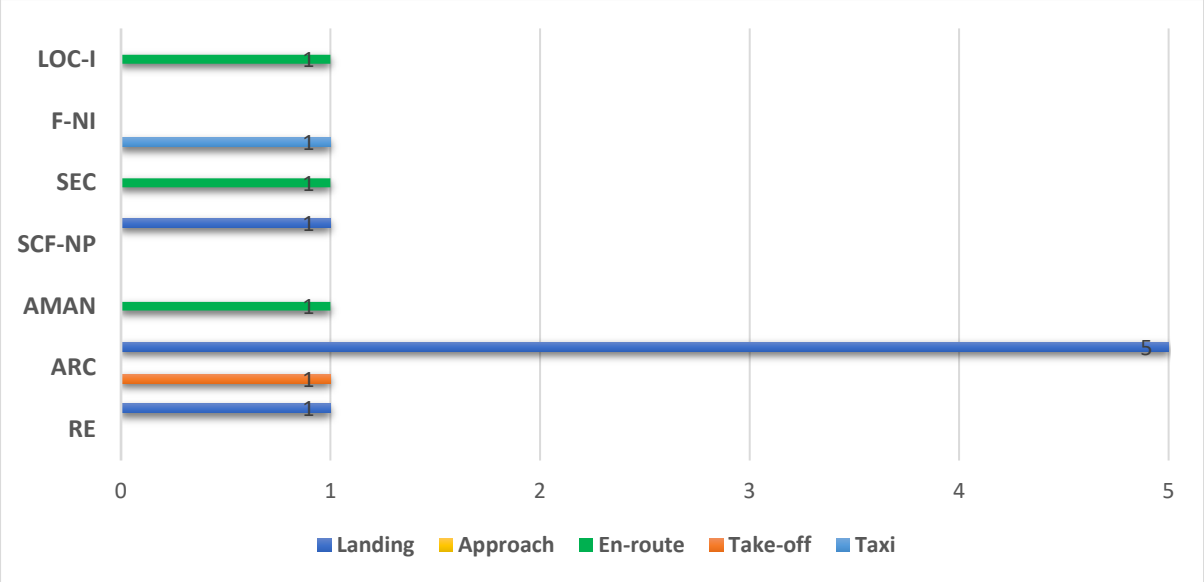
Graph 8 indicates that during the period (2017-2021), CFIT accidents have not been reported. However, the loss of control-inflight (LOC-I), runway excursion (RE), and abnormal runway contact (ARC) events represent the main areas of concern. In respect of the occurrence category Abrupt Manoeuver (AMAN), the flightcrew received TCAS RA and applied high rate of climb according to the TCAS display to prevent Mid air collision with military aircraft which caused injuries to some persons on board.



Graph 8: Distribution of Occurrence Category Per Year (2017-2021) ((Source OVSG Data& ICAO ASR 2022)

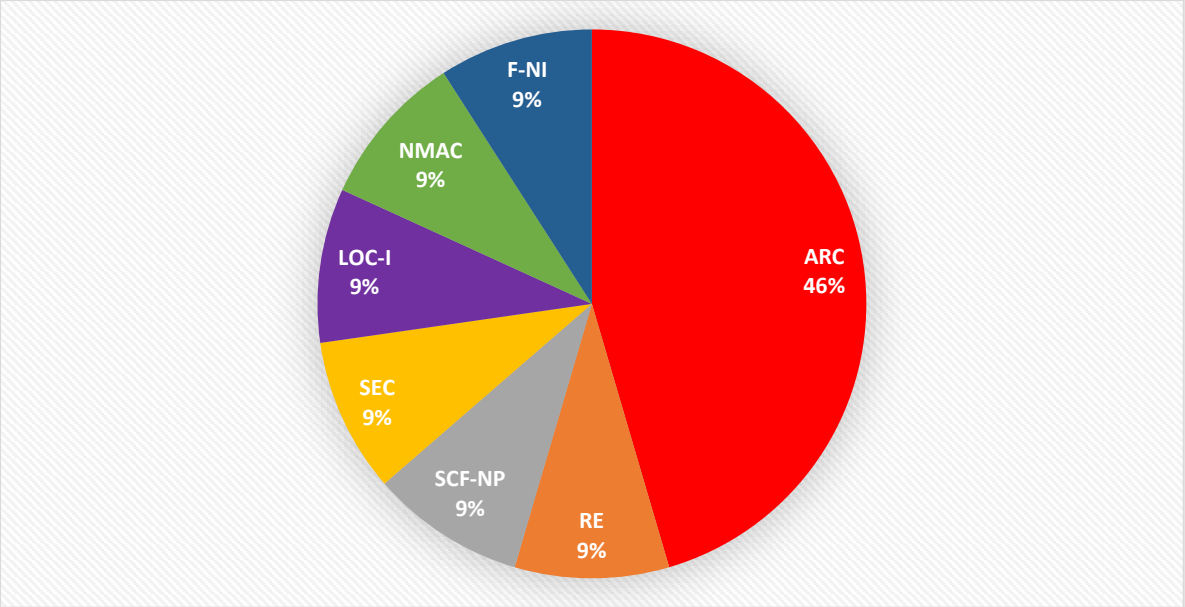
2.2.1.3 Phase of Flight

Graph 9 shows that most accidents occurred during landing phase of flight. The majority of Abnormal Runway Contact (ARC) and Runway Excursion (RE) events took place during landing flight phase. The Loss of Control-Inflight (LOC-I) occurred during En-route flight phase.



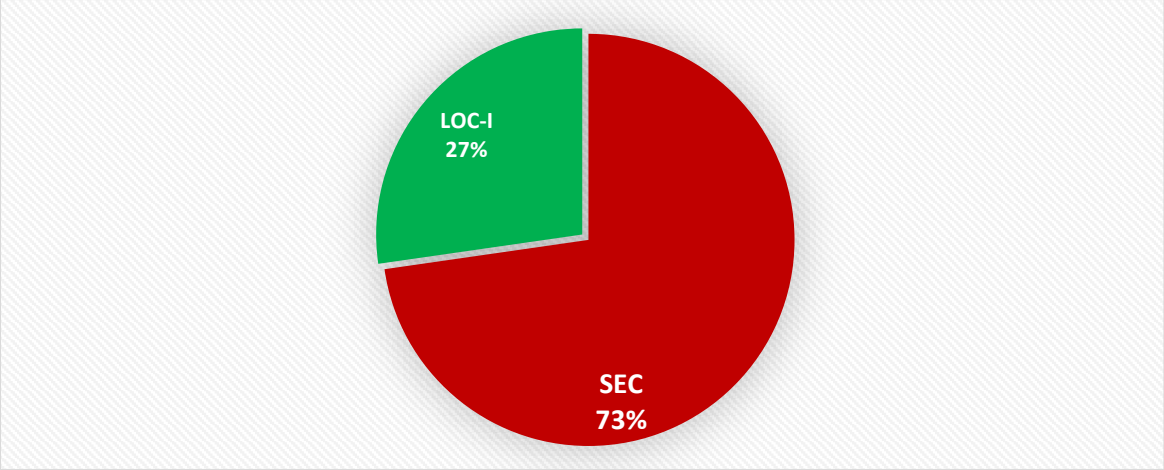
Graph 9: Distribution of Occurrence Category Per Phase of Flight (2017-2021) (Source OVSG Data& ICAO ASR 2022)

Graph 10 shows that most of the high risk category (HRC) accidents experienced during the 2017-2021 were RE/ARC, LOC-I, and MAC. It is to be noted that for the Abrupt Manoeuver (AMAN) occurrence category, the flightcrew received TCAS RA and applied high rate of climb according to the TCAS display to prevent Mid air collision with military aircraft which caused injuries to some persons on board. Therefore, the MAC occurrence category was also considered as HRC.



Graph 10: Occurrence Category Distribution as Percentage Per Accident (Source OVSG Data& ICAO ASR 2022)

Graph 11 shows that the fatalities for the period 2017-2021 were mainly associated to the following Occurrence Categories: Security related (SEC) and Loss of Control-Inflight (LOC-I).



Graph 11: Fatalities Distribution as Percentage by Occurrence Category (2017-2021) (Source OVSG Data& ICAO ASR 2022

Taking a more in-depth look at the fatal accidents and accidents for the MID Region (State of occurrence) for the period 2016-2020, the following observations are made:

A. In terms of fatality, the top three fatal accidents categories in the MID Region are:

1. Security related (SEC);
2. Loss of Control-Inflight (LOC-I);

B. In terms of frequency, the most frequent accidents categories in the MID Region (State of occurrence) are:

1. Runway Safety (RS) including (RE and ARC);
2. Near Mid Air Collision (NMAC);
3. System Component Failure – Non-Power Plant (SCF-NP); and
4. Fire/Smoke (F-NI).

Identification of the Key Risk Areas based on the analysis of accident data related to the State of Occurrence (2017-2021)

To facilitate the identification of the safety priority areas; the safety risk assessment methodology is applied.

Main Risk Area	Frequency	Severity	Risk Level
Loss of Control-Inflight (LOC-I)	3	1	3
Runway Safety (RS)-(RE/ARC)	1	3	3
Security (SEC)	3	1	3
Near Mid Air Collision (NMAC)	4	1	4
System Component Failure – Non-Power Plant (SCF-NP)	4	3	12
Fire/Smoke (F-NI)	4	3	12

Table 3: Key Risk Area

Therefore, the key risk areas according to the State of occurrence's accidents data are

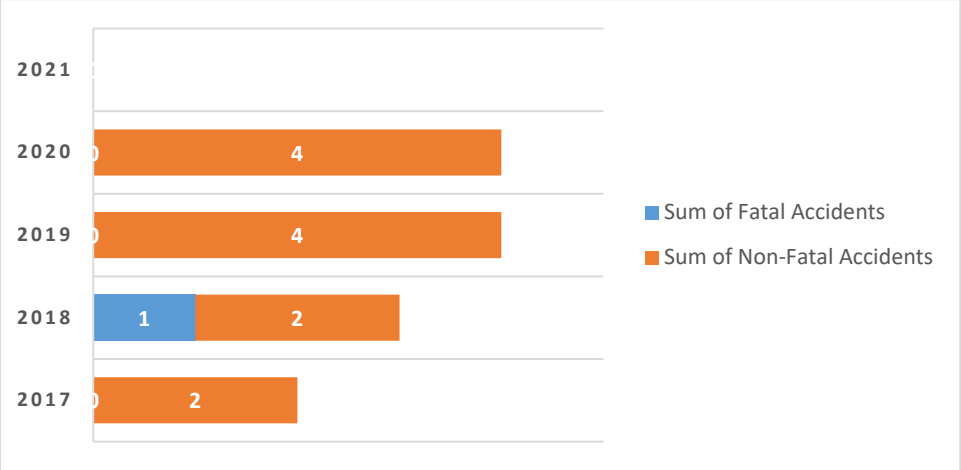
1. Loss of Control -Inflight (LOC-I)

2. Runway Safety (RS): Runway Excursion (RE) and Abnormal Runway Contact (ARC) during landing;
3. MID Air Collision (MAC); and
4. Security related (SEC).

2.2.2 MID State of Registry and Operator

2.2.2.1 Accident Data Analysis

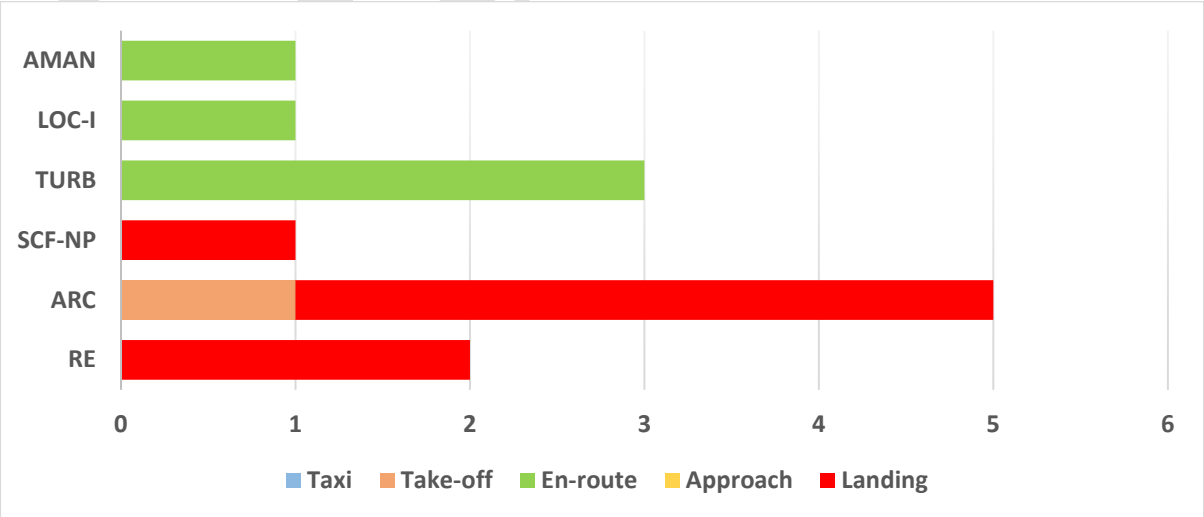
Graph 12 shows the change in the number of Fatal Accidents and non-Fatal Accidents over the last five years involving MID State of registry and State of operator airplanes. The Graph 12 also indicates that one fatal accident was recorded during 2018 and resulted in 176 fatalities.



Graph 12: Number of Fatal and Non-Fatal Accidents per Year (2017-2021) Source OVSG Data& ICAO ASR 2022)

2.2.2.2 Phase of Flight

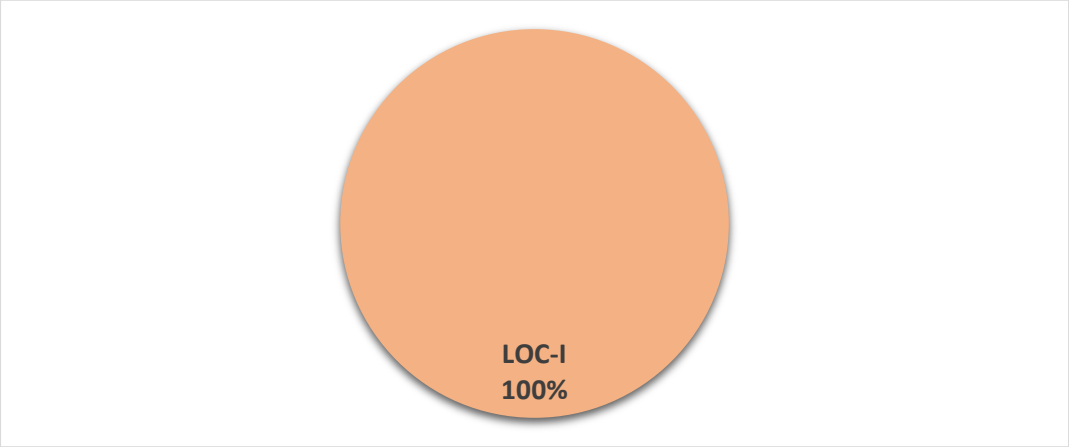
The Graph 13 shows that the majority of accidents related to Runway Excursion (RE), Abnormal Runway Contact (ARC), and system component failure- Non-power plant (SCF-NP) occurrence categories took place during landing flight phase. It was also noted that the Turbulence related accident occurred during en-route phases of flight. Regarding, Loss of Control Inflight (LOC-I), it took place during en-route.



Graph 13: Distribution of the Number of Accidents Category per Phase of Flight (2017-2021) (Source OVSG Data& ICAO ASR 2022

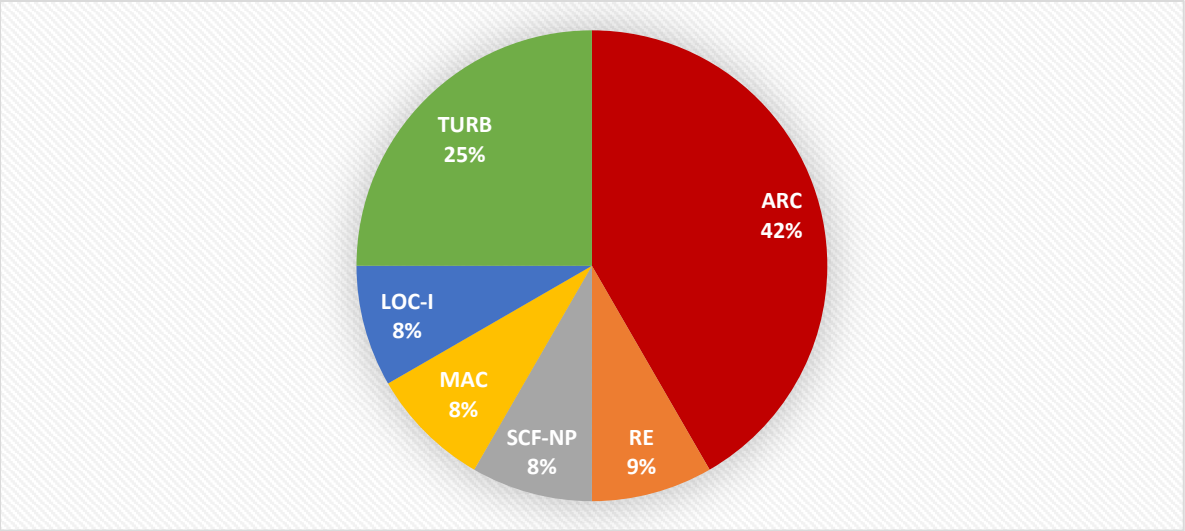
2.2.2.3 Occurrence Category

Graph 14 shows the percentage of fatalities associated with the accident Categories for the period 2017-2021: Loss of Control in flight (LOC-I).



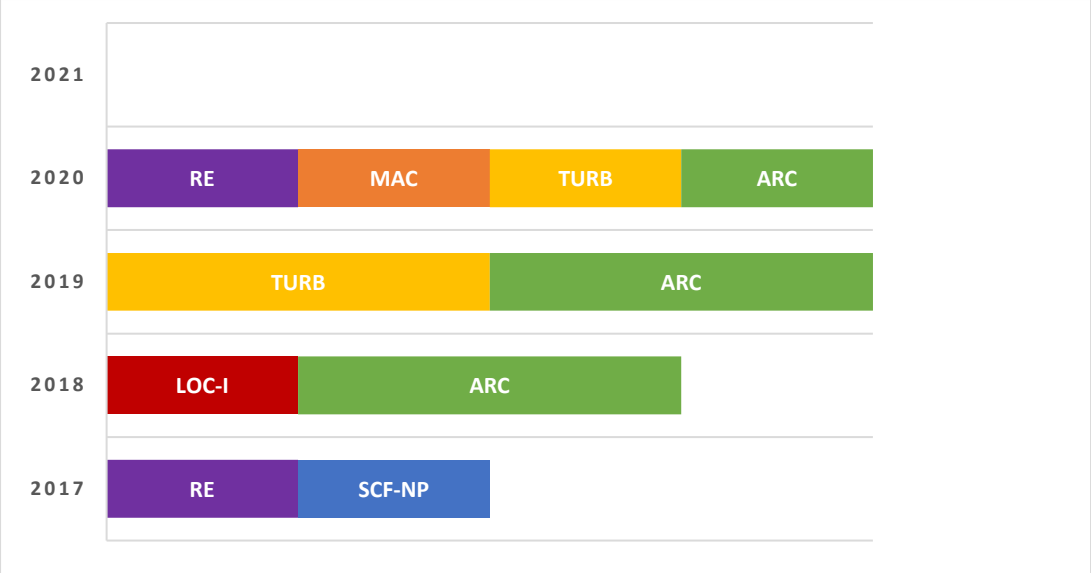
Graph 14: Fatalities Distribution as Percentage by Occurrence Category (2017-2021) (Source OVSG Data& ICAO ASR 2022)

Graph 15 shows that the high risk categories (HRC) identified are LOC-I, RE/ARC, and MAC. However, the RE and ARC are still the most frequent. One LOC-I occurrence had also resulted in fatalities. It is to be noted that for the Abrupt Manoeuver (AMAN) occurrence category, the flightcrew received TCAS RA and applied high rate of climb according to the TCAS display to prevent Mid air collision with military aircraft which caused injuries to some persons on board. Therefore, the MAC occurrence category was also considered as HRC.



Graph 15: Accident Distribution as Percentage per Occurrence Category (2017-2021) (Source OVSG Data& ICAO ASR 2022)

During 2017-2021, no CFIT accident occurred. However, One LOC-I fatal accident had taken place during the year 2018 involving aircraft from the Region. Runway Excursion (RE) and Abnormal Runway Contact (ARC) are also a serious concern in the Region. In respect of the occurrence category Abrupt Manoeuver (AMAN), the flightcrew received TCAS RA and applied high rate of climb according to the TCAS display to prevent Mid air collision with military aircraft which caused injuries to some persons on board. Turbulence (TURB) events were registered and are still prevailing as shown in Graph16.



Graph 16: Accident Category Distribution per Year (Source OVSG Data& ICAO ASR 2022)

Taking a more in-depth look at the fatal and non-fatal accidents for the MID Region (State of registry and State of operator) for the period 2017-2021, the following is to be highlighted:

A. In terms of fatality, the fatal accidents categories in the MID Region for the period 2017 – 2021 are:
   1. Loss of Control- In-flight (LOC-I).

B. In terms of frequency, the most frequent accidents categories in the MID Region (State of registry and State of occurrence) for the period 2017 – 2021 are:
   1. Runway Safety (RS) (REand ARC);
   2. Turbulence encounter (TURB);
   3. Near Mid Air Collision (NMAC); and
   4. System Component Failure- Non-Power Plant (SCF-NP).

Identification of the key risk Areas based on the analysis of safety data related to the State of registry and State of operator (2017-2021)

To facilitate the identification of the safety priority areas; the safety risk assessment methodology is applied.

Main Risk Area	Frequency	Severity	Risk Level
Loss of Control-Inflight (LOC-I)	2	1	2
Runway Safety (RS). (RE/ARC)	1	3	3
Mid Air Collision (MAC)	3	1	3
Turbulence (TURB)	2	5	10
System Component Failure- non power plan (SCF-NP)	4	4	16

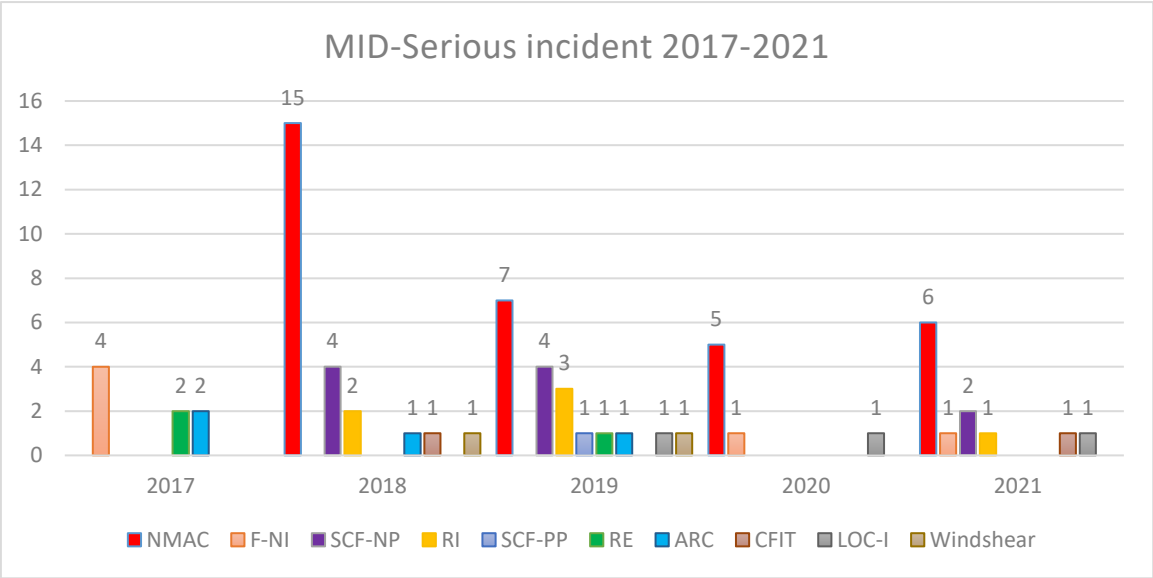
Table 4: key Risk Area

Therefore, the key risk areas according to the State of registry and operator accidents data are:
1. Loss of Control-Inflight (LOC-I);
2. Runway Safety (RS): Runway Excursion (RE) and Abnormal Runway Contact (ARC) during landing; and
3. Mid Air Collision (MAC).

2.2.2.4 Serious Incidents Data Analysis

2.2.2.4.1 Occurrence Category

Graph 17 shows the total number of serious incidents provided by the MID States for the period 2017-2021



Graph 17: Number of Serious Incidents Distribution Per Year (2017-2021)

The data shows that there was a significant increase on the number of NMAC Occurrences. The number of serious incidents data shared by the MID States have been considered and included in the analysis to shed light and identify the potential safety concerns in the MID Region. However further data analysis should be provided by the MID States for an in-depth analysis.
Taking a more in-depth look at the serious incidents reported by the MID Region for the period 2017-2021, the following is to be highlighted:

A. In terms of frequency, the most frequent serious incidents categories in the MID Region are:
   1. Near Mid Air Collision (NMAC);
   2. System Component Failure- Non poer plant (SCF-NP); and
   3. Runway incursion (RI).

With respect to the Mid Air collision (MAC)/ NMAC: The most common root causes for MAC occurrences are Human performance errors and Ineffective training for ATCs. In addition, this key risk area has been raised by some MID States specifically in the context of the collision risk posed by military aircraft operating in Gulf area over the high seas which are not subject to any coordination with related FIRs for airborne operation.

For the System Component Failure-Non-Power Plant (SCF-NP): Unexpected technical failure, lack of maintenance, not complying with the ICAO standards for Air Operator Certificates (AOC) & Operations Specifications, flying with Minimum equipment limitations
The main safety issues indentified and shared by the States as follows:

- Regulatory oversight
- Human factors and competence of personnel
- EGPWS warning (GPS failure)
- TCAS/RA
- Runway Incursion
- Low level wind shear
- System Component Failure-Power Plant (SCF-PP)
- Technical failures
- Birdstrike

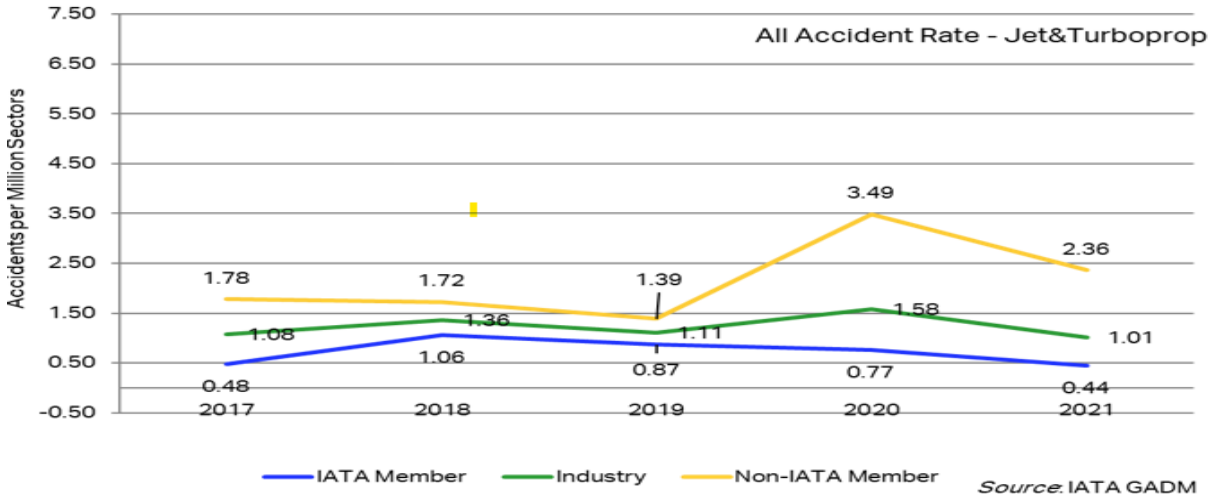
2.2.2.5 IATA Data

During 2021, there were a total of 26 accidents worldwide, of which 7 caused 121 fatalities.
The number of air traffic reported in 2021 is up by 16% compared to 2020; and it represents 55% of the traffic in 2019.
The 2021 industry accident rate of 1.01 per million sectors is below the 5-year accident average of 1.23. Looking at the rolling average, the data shows a continued reduction in accident rates, from 1.35 (2016-2020) down to 1.23 (2017-2021).
IATA Members' overall safety performance has dropped from 0.77 in 2020 down to 0.44 accidents per million sectors in 2021.

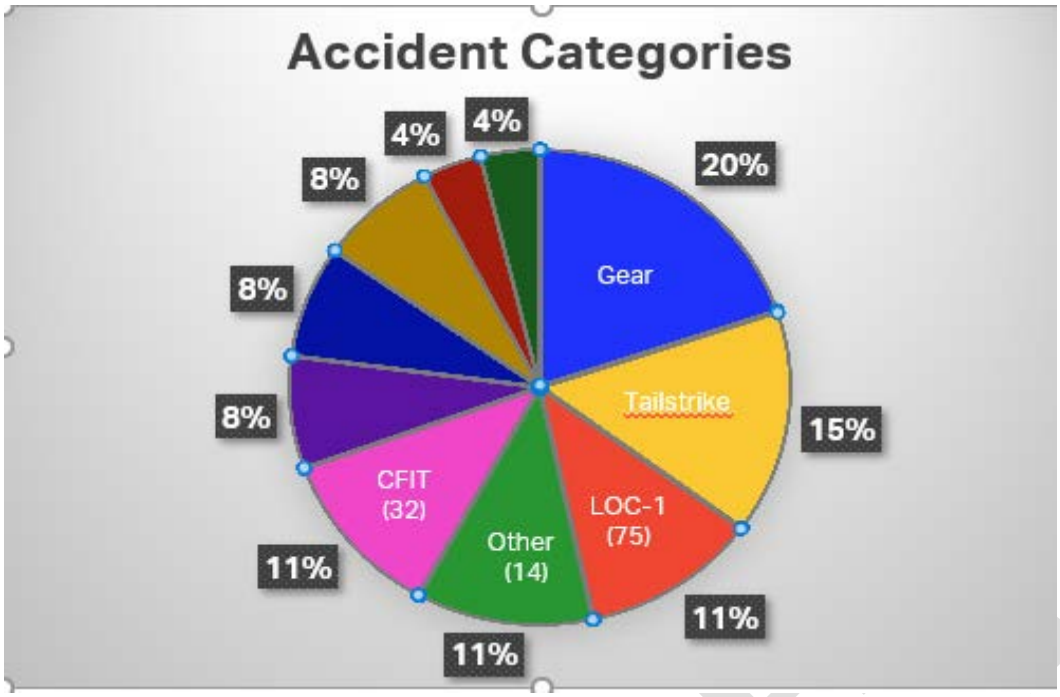
	2019	2020	2021
Total Accidents	52	38	26
Total Jet Hull Losses	6	3	3
Total Turboprop Hull Losses	5	5	5
Total Fatal Accidents	8	5	7
Total Fatalities on board	240	132	121
Total IATA Member Accidents	22	12	8
Sectors*	46.8	22.2	25.7

* In Million flights

2021 saw zero Runway / Taxiway Excursion Accidents - the first time, according to IATAs historical database. LOC-I could not maintain the zero record that had in 2020, there were three accidents in 2021, resulting in 75 fatalities. Ground Damage caused zero accidents for the first time in over 15 years. Gear Up Landing / Gear Collapse and Tail Strike had the highest frequency of accidents with 4 accidents each (15%).
The industry accident rate in 2021 is down from 1.58 in 2020 to 1.01 accidents per million sectors.
The 1.01 is below the 5 years accident average rate of 1.23.



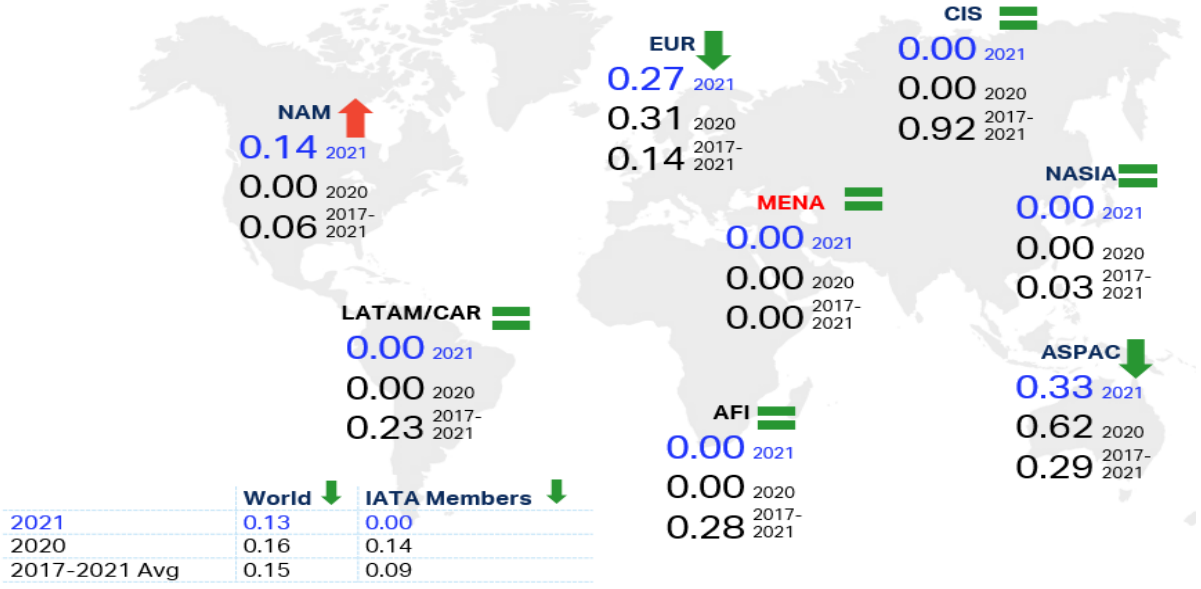
Graph 18: IATA all accident rate (2017-2021)



Graph 19: IATA- accident categories

Three LOC-I accidents – 75 fatalities; Four accidents relating to Tailstrike; Five accidents relating to Gear Up/ Collapse; No Runway / Taxiway Excursion Accidents; and No Ground Damage accidents , first time in over 15 years.

Jet Hull Loss Accident Rate per Region of Operator.MENA has 0 accidents of jet as well turboprop aircraft.



	World	IATA Members
2021	0.13	0.00
2020	0.16	0.14
2017-2021 Avg	0.15	0.09

Graph 20: IATA- accident rate per Region

2.2.3 ICAO In-depth Analysis of Accidents

2.2.3.1 Runway Excursions and Abnormal Runway Contact:

During 2017-2021, Runway Excursions and abnormal runway contact accidents and serious incidents mainly occurred in the landing phase of flight. This focus area covers the risk of runway excursions,

including the direct precursors such as hard landings, high speed landing, landings following an un-stabilized approach. The MID Region continued improvement in runway safety, which is one of the industry's principal risk areas. Table 5 indicted the root cause.

Root Cause Analysis		
Latent Conditions	**1**	Ineffective safety management system
	2	Incomplete/inefficient operator SOP
	3	Deficient flight crew training
	4	Regulatory oversight
Threat	**1**	Decision to make a landing on short runway with tailwind
	2	Poor judgment and continued landing after an un-stabilized approach
	3	Improper calculating of landing speed without focusing on the tailwind component
	4	Technical failures Pilot information
	5	Ineffective reporting of runway surface condition/Contaminated runways
	6	Airport facilities including poor runway paintings/markings/signage lighting
	7	Meteorology
Errors	**1**	Timely crew decisions (very low-level go-arounds)
	2	Failed to go around after un-stabilized approach
	3	SOP Manual not updated and maximum tailwind not mentioned
	4	Manual handling/flight controls
	5	Contaminated runways
Contributing factors	**1**	High Airspeed and Low Engine Thrust. Anti-skid failures of landing gear causing prolong landing distance.
	2	Instantaneous variable wind condition on aerodrome traffic pattern.
	3	Late activation of airbrakes and spoilers (especially airbrakes) with tailwind cause to increase the landing roll distance.

Table 5: RE and ARC Root Cause

Some of the Precursors, which could Lead to Runway Excursion:

A. Precursors for aircraft overrunning the end of the runway on landing (landing overrun) could include:
    1. Long landing / high across threshold / extended flare / floating,
    2. incorrect performance calculation,
    3. ineffective use of stopping devices / time to apply reverse thrust or braking / inappropriate use of auto brake setting,
    4. weather related / runway condition / aquaplaning, unsterilized approach, tailwind landing.

B. Precursors for aircraft veering off the side of the runway during landing (landing veer-off) could include:
    1. Crosswind and wet /contaminated runway,
    2. hard landing / inappropriate use of stopping devices / asymmetric braking or reverse thrust,
    3. inappropriate use of nose wheel steering.

2.2.3.2 Loss of Control-Inflight

During 2017-2021 Aircraft upset or Loss of control contributed to one fatal accident. During the year 2018, the LOC-I occurred during En-route phase of flight. Table 6 below the root-cause analysis is based mainly on industry's analysis of the LOC-I accidents:

Root Cause Analysis		
Latent Conditions	**1**	Inadequate safety management system including the use of the FDM data
	2	Incomplete/Inefficient Flight operations
	3	Regulatory oversight
Threat	**1**	Inappropriate Flight Crew Automation training
	2	Type-rating related issues on complex and highly automated aircraft
	3	Contained engine/power plant malfunction
	4	Severe turbulence, Thunderstorms, wind shear/Gusty wind
	5	Poor visibility/IMC conditions
	6	Spatial disorientation/Somatogravic illusion
	7	Flt Crew misdiagnose the problem leading to the application of an incorrect recovery procedure
	8	Lack of exposure to the required maneuvers during normal line flying operations
	9	Limitations in simulator fidelity could lead to pilots not having the manual flying skills required to recover from some loss of control scenarios.

Errors	**1**	Inappropriate/Incorrect use of Automation by flight crew
	2	Inadequate flight crew monitoring skills/awareness or communication
	3	Flt Crew mishandling of manual flight path and/or speed control
	4	Abnormal checklist
	5	Incorrect recovery technique by flight crew when their aircraft has become fully stalled
Contributing factors	**1**	Unnecessary weather penetration
	2	Operation outside aircraft limitations
	3	Unstable approach
	4	Vertical/lateral speed deviation

Table 6: LOC-I Root Cause

A. Direct Precursors to a Loss of Control Event:

1. Deviation from flight path
2. Abnormal airspeed or triggering of stall protections

2.3 MID Region Safety Performance - Safety Indicators-Reactive

2.3.1 Goal 1: Achieve a Continuous Reduction of Operational Safety Risks

		Average 2017-2021		2021	
Safety Indicator	**Safety Target**	**MID**	**Global**	**MID**	**Global**
Number of accidents per million departures	Reduce/Maintain the Regional average rate of accidents to be in line with the global average rate by **2016**	2.21	2.41	0	1.93
Number of fatal accidents per million departures	Reduce/Maintain the Regional average rate of fatal accidents to be in line with the global average rate by **2016**	0.42	0.41	0	0.16
Number of Runway Excursion related accidents per million departures	Reduce/Maintain the Regional average rate of Runway Excursion related accidents to be below the global average rate by **2016**	0.28	0.3	0	0
Number of Runway Incursion accidents per million departures	Regional average rate of Runway Incursion accidents to be below the global average rate	**0**	**0.08**	0	0.04

Number of LOC-I related accidents per million departures	Reduce/Maintain the Regional average rate of LOC-I related accidents to be below the global rate by **2016**.	0.14	0.07	0	0.08
Number of CFIT related accidents per million departures	Reduce/Maintain the Regional average rate of CFIT related accidents to be below the global rate by **2016**.	0	0.02	0	0.08
Number of Mid Air Collision (accidents)	Zero Mid Air Collision accident	0	0	0	0

Table7: Goal 1-Safety indicators-Reactive

3. Proactive Safety Information

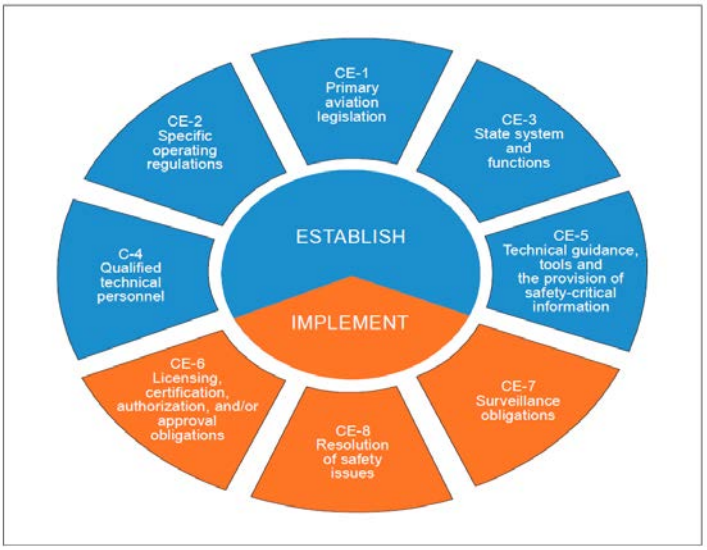
This section of the Annual Safety Report focuses on proactive safety data analysis to identify organizational issues that forms the basis for the development of SEIs.

3.1 ICAO USOAP-CMA

3.1.1 USOAP-CMA Review

Each ICAO Member State is expected to establish and maintain an effective safety oversight system that addresses all safety-related areas of aviation activities. The Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA) measures the effective implementation (EI) of a State's safety oversight system.

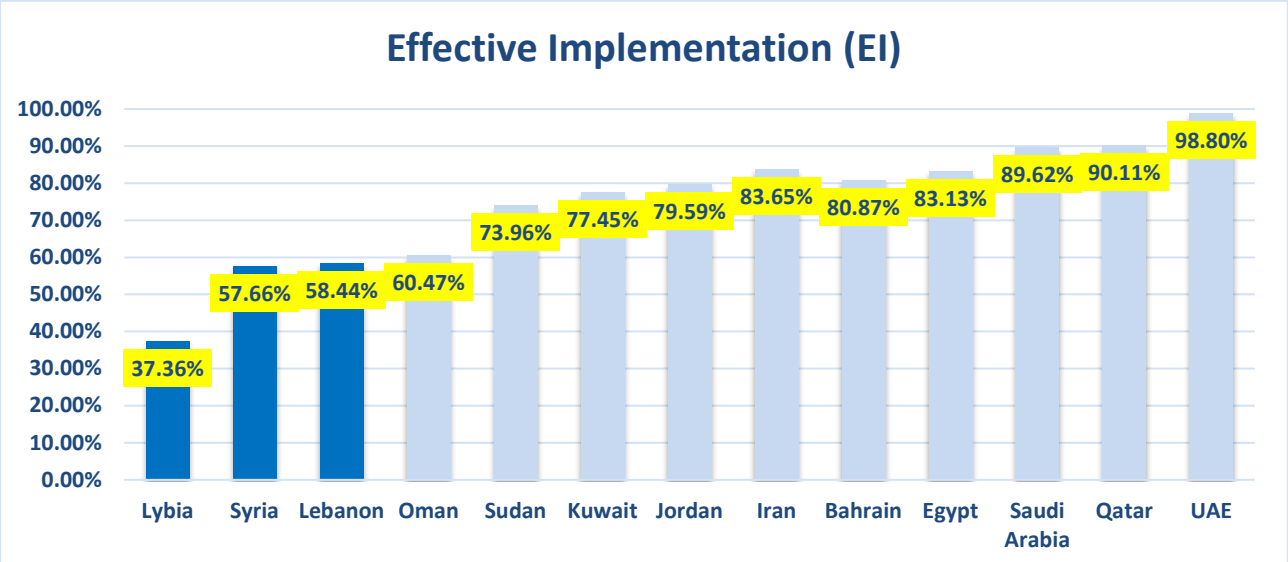
In order to standardise the audits conducted under the USOAP CMA, ICAO established protocol questions (PQs) based on safety-related ICAO Standards and Recommended Practices (SARPs) established in the Annexes to the Chicago Convention, the Procedures for Air Navigation Services (PANS), and supporting ICAO guidance material. The PQs contribute to assessing the eight critical elements (CEs) of a State's safety oversight system.



Graph 21. Critical elements of a State's safety oversight system

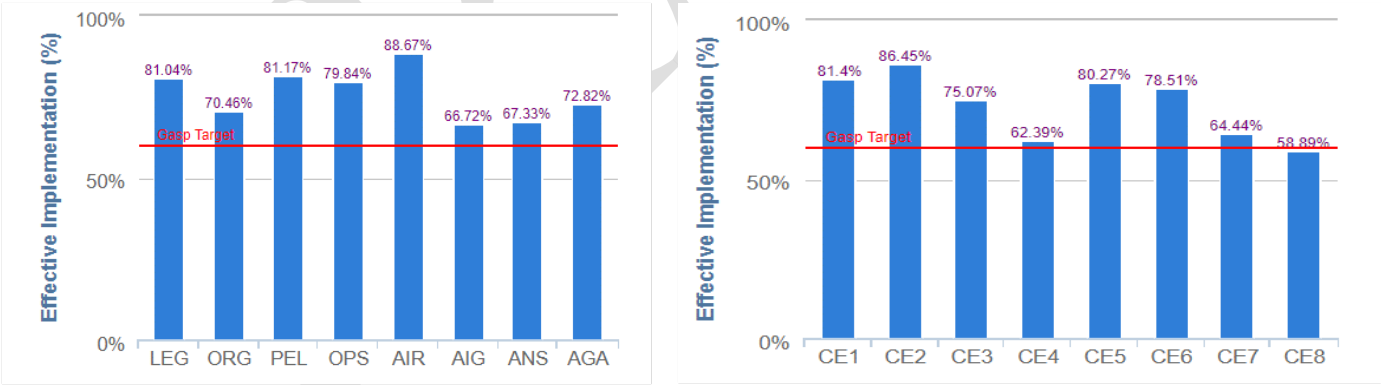
The Regional average overall Effective Implementation (EI) in the MID Region (13 out of 15 States have been audited) is 74,67 %, which is above the world average 69.32 % (as of 29 May 2022). Three (3) States are currently below EI 60%.

Currently, 77% of the audited States achieved the target of 60% EI, as suggested by the Global Aviation Safety Plan (GASP) and the MID-RASP 2020-2022 Edition.



Graph 22: Source: ICAO USOAP CMA Online Framework (OLF) & iSTARS, as of 29 May, 2022

The EI by Area (e.g. Operations, Airworthiness) shows that all areas are above 60% EI, which reflect the improvement in the oversight capabilities particularly in the area of ANS and AGA. With respect to the Critical Elements (CEs), CE4 (Qualified technical personnel) improved and is above 60% (62.39%) EI, whereas CE8 (resolution of safety issues) is the only one below EI 60% (58. 89%) EI.



Graph 23: Source: ICAO iSTARS, as of 30 May 2022

3.1.2 ICAO USOAP CMA Activities — MID States Status for 2021

The main activities under USOAP-CMA are:

- **Audit:** This activity is performed on-site to conduct a systematic and objective assessment of State's safety oversight system. It can be full or limited.
- **ICAO Coordinated Validated Mission (ICVM)**: This activity is performed to assess a State's effective corrective actions addressing previously identified findings related to PQs requiring an on-site activity.

- **Off-site Validation activity**: This activity is performed to assess a State's effective corrective actions addressing previously identified findings related to PQs not requiring an on-site activity.
- **State Safety Programme Implementation Assessment (SSPIA):** This activity is to perform a qualitative (non-quantitative) assessment of the progress made by State in implementing SSP. Broken down into 8 areas: GEN (SSP general aspects), SDA (safety data analysis), PEL, OPS, AIR (AMO aspects only), ANS (ATS aspects only), AGA, and AIG.

USOAP CMA on-site activities for 2020 have been postponed due to the glolbal pandemic restrictions.

State/organization	Type of activity	Date	Status
Iran (Islamic Republic of)	Audit	29 Nov to 11 Dec 2021	**Postponed**. Planned for 2022
Lebanon	ICVM	19 to 26 Oct 2022	Planned for 2022

Table 8: ICAO USOAP CMA Activities — MID States Status for 2021

3.2 MID Region State Safety Programme (SSP)

3.2.1 SSP Implementation Assessments (SSPIAs)

ICAO launched SSP Implementation Assessments (SSPIAs) under the USOAP CMA. The assessments are based on a qualitative assessment of a State's progress in implementing a State Safety Programme (SSP), using SSP-related PQs. The PQs are reflective of Annex 19- Safety Management and the Safety Management Manual (Doc 9859).

Unlike the USOAP CMA's audit activities, SSPIAs are linked to applicable SSP components rather than critical elements (CEs). The SSP components are:

1. State safety policy, objectives and resources;
2. State safety risk management;
3. State safety assurance; and
4. State safety promotion

The SSP assessment covers 8 areas as indicated below:

1. SSP general aspects (GEN);
2. safety data analysis general aspects (SDA);
3. personnel licensing and training (PEL);
4. aircraft operations (OPS);
5. airworthiness of aircraft (AIR), approved maintenance organization (AMO) aspects only;
6. air navigation services(ANS), air traffic services provider (ATSP) aspects only;
7. aerodromes and ground aids (AGA); and
8. aircraft accident and incident investigation (AIG).

From 2018 to 2019, ICAO conducted three voluntary and non-confidential SSPIAs under Phase 1. This first phase of SSPIAs involved voluntary assessments of States regarding their progress in implementing an SSP and any planned steps or future enhancements to the programme. Three additional assessments were scheduled in 2020; however, they were postponed, due to global pandemic restrictions.

In 2020, ICAO developed guidance supporting the determination of maturity levels for each SSP-related PQ. The SSP-related PQs, complemented by the maturity level matrices for each of the SSP audit areas, are available in the CMA Library of the USOAP CMA Online Framework (OLF) at www.soa.icao.int (restricted access). These matrices describe the level of progress for each element of the SSP, which can be described as:

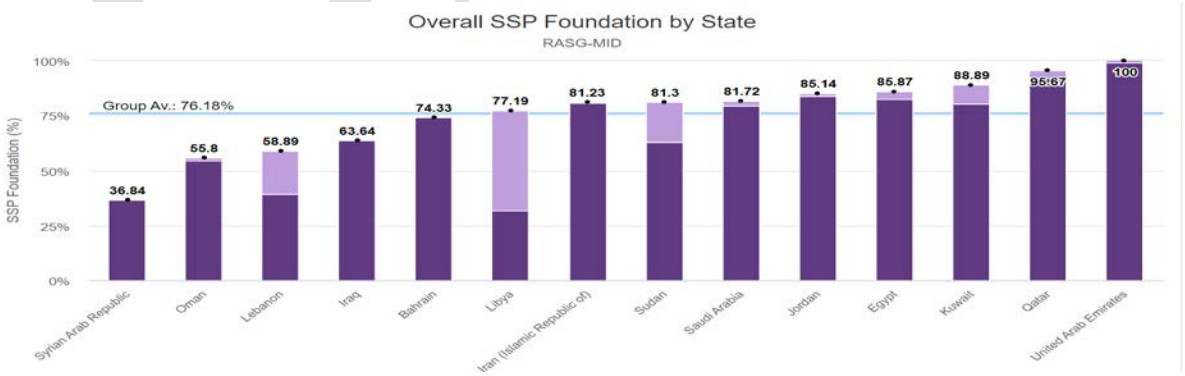
- Present and effective
- Present
- Not present but being worked on; or
- Not present and not planned

ICAO will use the SSP maturity level matrices for the scheduled SSPIAs under Phase 2, which will begin in 2021. This phase of assessments will utilize the maturity level matrices to provide a more detailed, quantitative measurement of a State's progress in the implementation and maintenance of its SSP. Two assessment missions have been planned for the year 2022.

3.2.2 SSP Foundation

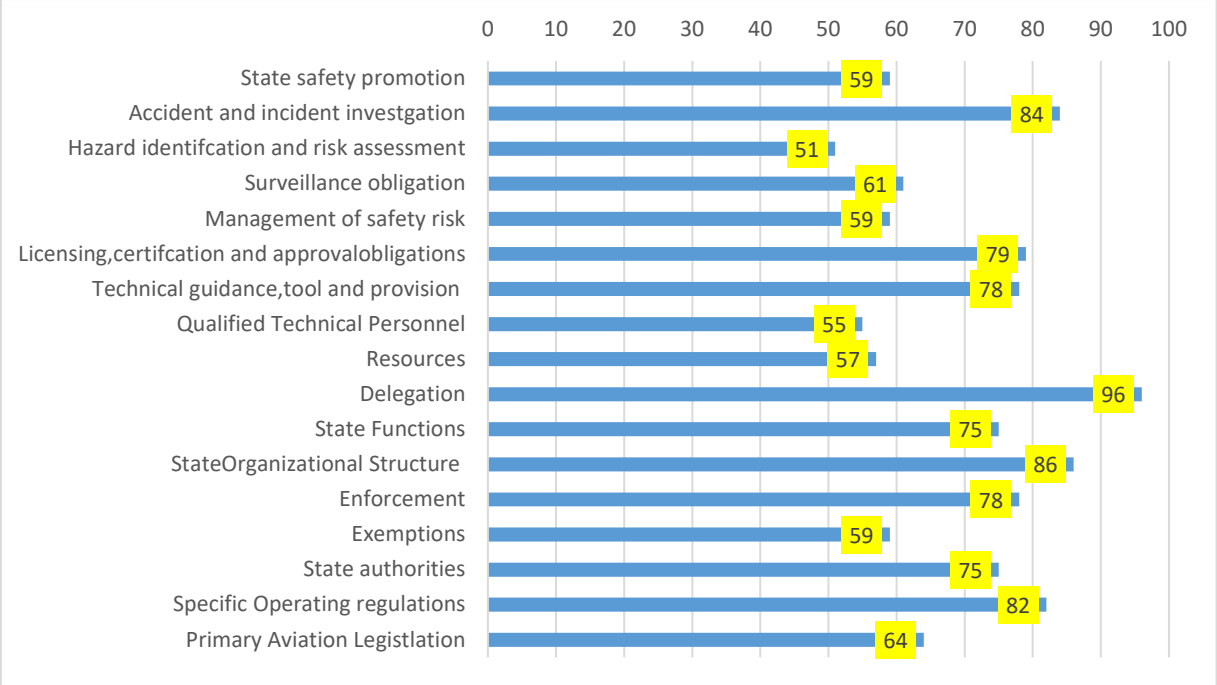
Safety Management Tools: The full list of SSP Foundation PQs can be found on the SSP Foundation tool, available on iSTARS since 2017.

A sub-set of 299 Protocol Questions (PQs) out of the 1,047 PQs used to calculate the USOAP Effective Implementation (EI). This sub-set of questions are considered as the foundation for a State Safety Programme (SSP) implementation. A SSP Foundation indicator is calculated, as the percentage of PQs which are either validated by USOAP or submitted as completed through the corrective action plans (CAP) on the USOAP CMA Online Framework.The average EI for SSP foundation PQs for States in the MID Region is 76, 18%. The SSP foundation EI for MID Region States is shown in the graph 21 below. The global average EI of SSP Foundation PQs increased from 73.71 in March 2020 to 74.64 per cent in as of 30 May 2022.



Graph 24: Overall SSP foundation for MID Region States (Source: iSTARS as of 30 May 2022)

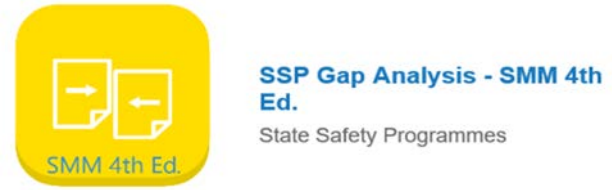
The sub-set of PQs are grouped by 17 subjects based on the Annex 19 amendment 1 and the 4th edition of the Safety Management Manual (forthcoming). States with EI above 60% may still have PQs to address which are fundamental for their SSP. Hazard identification and risk assessment is the lowest one with 51%, followed by qualified technical personnel with 55%.



Graph 25: Average EI by Safety Management subjects for States in MID Region (Source: iSTARS as of 30 May 2022)

3.2.3 SSP Gap Analysis

Safety Management Tools: The application was updated in 2019 to reflect Amendment 1 to Annex 19 and the 4th edition of the SMM. It now comprises 62 questions, which cover all the requirements of an SSP and provides project owners the opportunity to develop an implementation plan to address the gaps identified.



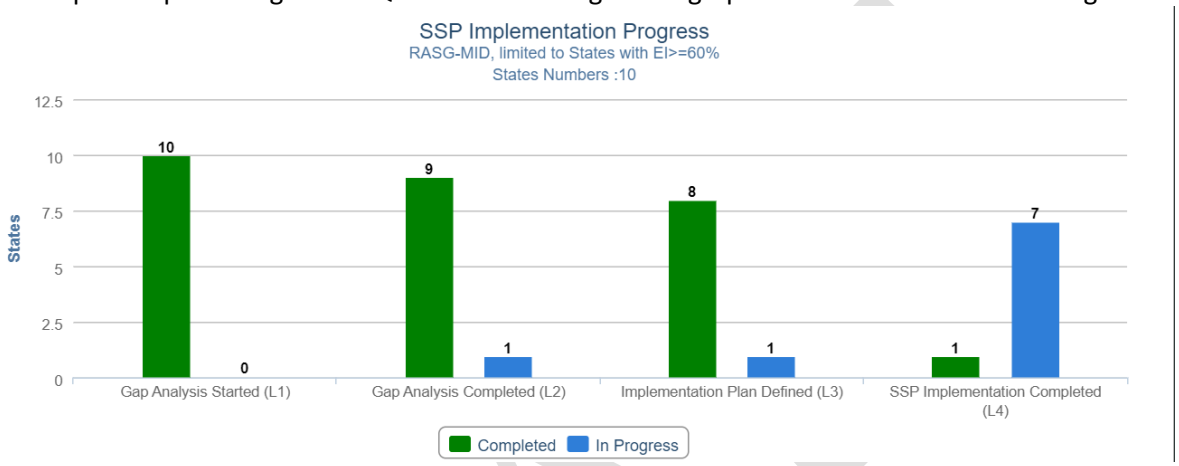
These PQs can be prioritised and addressed when conducting the SSP gap analysis or while defining the SSP implementation/action plan. States can use the ICAO iSTARS online to perform an SSP Gap Analysis-SMM 4th Edition. This provides an indication of the broad scope of gaps and hence overall workload to be expected. This initial information can be useful to senior management in anticipating the scale of the SSP implementation effort and hence the resources to be allocated/provided.
The SSP statistics shown in the graph 26 are high-level information about each Gap analysis project performed by States themselves (Self-reported by the State and not validated by ICAO). SSP implementation progress has been measured for each State using simple milestones as per the entered data.

State Safety Programme (SSP) Implementation

ICAO measures SSP implementation in levels as follows:

- Level 1: States having started a GAP analysis
- Level 2: States having reviewed all the GAP analysis questions
- Level 3: States having defined an implementation plan to address the gaps
- Level 4: States having closed all actions and fully implemented their SSPs

The completion percentage of GAQs in each level is given in graph 26 for States in the MID Region.

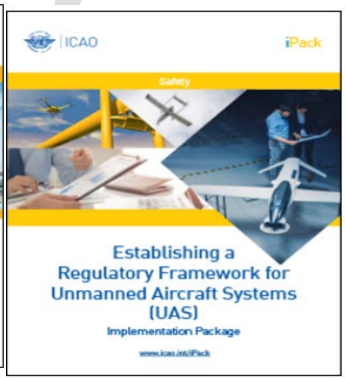


Graph 26: SSP Implementation Progress for States in MID Region, Limited to States with EI>=60%- States number: 9 (Source: iSTARS as of 30 May 2022)

3.2.4 Implementation Packages

On 17 July 2020, ICAO issued Electronic Bulletin 2020/40 informing States of the availability of implementation packages (iPacks) to support States in their response, recovery and resilience efforts following the COVID-19 outbreak. An iPack is a new ICAO initiative, which bundles standardized guidance material, training, tools, checklists and subject matter expert support to facilitate and guide the implementation of ICAO provisions for State entities (e.g. governments, civil aviation authorities (CAAs), national air transport facilitation committees), aviation service providers, supply chain stakeholders and their personnel.

iPacks are developed and implemented in full alignment with the measures and recommendations contained in the Council Aviation Recovery Task Force (CART) Report.



The National Aviation Safety Plan (NASP), Aerdrome Restart, and Unmanned Aircrfat Systems (UAS) iPacks are being deployed to support States in the MID Region. So far three States from MID Region completed the development of NASP and shared with ICAO.

3.2.5 MID Region State Safety Programme (SSP) Implementation challenges

Implementation of SSP is one of the main challenges faced by the State in the MID Region. The RASG-MID addresses the improvement of SSP implementation in the MID Region as one of the top Safety Enhancement Initiatives (SEIs). Common challenges have been identified based on the States' feedback, as follows:

1. Establishment of an initial Acceptable Level of Safety Performance (ALoSP), which necessitates effective reporting system to support collection/analysis of safety data;
2. Allocation of resources to enable SSP implementation
3. Identification of a designated entity (SSP Accountable Executive and SSP Implementation Team); and
4. Lack of qualified and competent technical personnel to fulfil their duties and responsibilities regarding SSP implementation.

The following actions were recommended to support the SSP implementation:

- Continuous update of the SSP Gap Analysis available on iSTARS
- Participate in the new ICAO Safety Management Training Programme (SMTP), with the CBT part and the Safety Management for Practitioners Course;
- Work with the ICAO Regional Office to make use of available means (e.g. Technical Co-operation Bureau) to provide assistance needed for SSP implementation;
- Identify safety management best practices in coordination with States (champion State to promote best practices among other States) including sharing of technical guidance and tools related to SSP (e.g. advisory circulars, staff instructions);
- Establishment of voluntary and mandatory safety reporting systems.
- The RASG-MID also supported the establishment of the MENA RSOO, with a primary objective to assist member States to develop and implement SSP. The MENA RSOO is still in the establishment and activation process.
- Several Safety Management Workshops, training courses, webinars, and meetings have been organized to support the implementation of SSP/SMS and address the challenges and difficulties, as well as sharing of experiences and best practices.
- In addition, the MID Region safety management implementation Roadmap has been endorsed by the RSC/7 to assist MID Region States to comply with the requirement for the implementation of the SSPs by States and the SMS by service providers as established in the Annex 19, Safety Management, GASP 2020-2022 Edition, and MID-RASP 2020-2022 Edition. The Roadmap will be linked to the MID NCLB Strategy in order to support the States in a prioritized manner and will be implemented within the RASG-MID framework.
- Moreover, the Safety Management Implementation Team (SMIT) is established as the main Regional Framework for the provision of assistance to States through Safety Management Assistance Missions. Its handbook endorsed by the RASG-MID/9 to support States with SSP implementation in an effective and efficient manner.

3.3 Human Factors and Competence of Personnel

As the aviation system changes, it is imperative to ensure that human factors and the impact on human performance are taken into account, both at service provider and regulatory levels. Human factors and human performance are terms that are sometimes used interchangeably. While both human factors and human performance examine the capabilities, limitations and tendencies of human beings, they have different emphases:

- Human Factors (HF)- this term focusses on why human beings function in the way that they do. The term incorporates both mental processes and physical ones, and the interdependency between the two.
- Human Performance (HP)- the output of human factors is human performance. This term focusses on how people do the things that they do.

As new technologies emerge on the market and the complexity of the system continues increasing, it is of key importance to have the right competencies and adapt training methods to cope with new challenges. Crew Resource Management (CRM) has been identified in the MID ASR as a safety issue in the domain of commercial air transport. In addition, Team Resource Management (TRM) was introduced into ATC following the success achieved with CRM in the airline community enhancing teamwork practices. The practice is applied within virtually every airline with training given to pilots and other operational staff.
Within the last decade in ATM there have been numerous advances in widespread acceptance of SMS under the guidance of ICAO. ICAO has now mandated the use of SMS Manual Doc 9859 to standardize the approach to safety. TRM as defined by ICAO is an integral component of SMS under human factor.

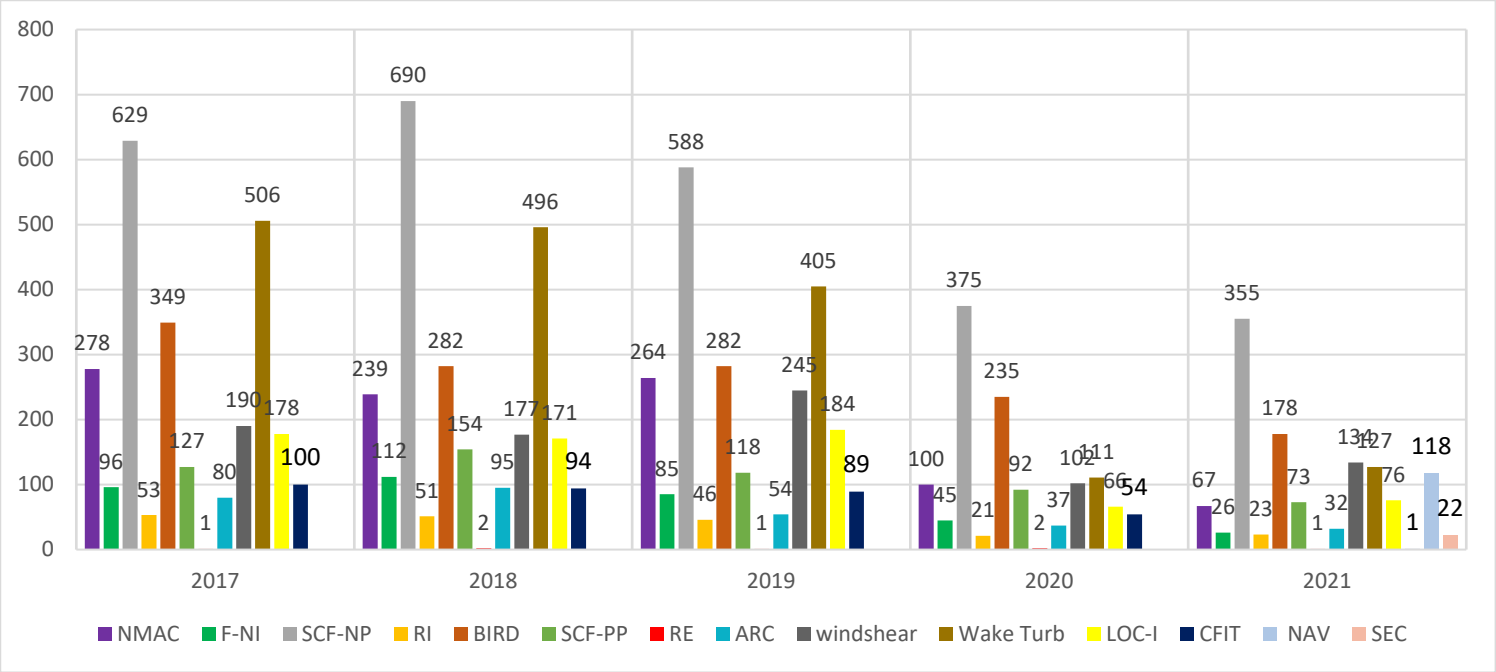
3.4 Cybersecurity

The global civil aviation ecosystem is accelerating towards more digitalisation. This implies that any exchange of information within any digital workflow of the aviation community needs to be resilient to information security threats which have consequences on the safety of flight or the availability of airspace and beyond. Aware of the complexity of the aviation system and of the need to manage the cybersecurity risk the MID Region needs to consider and address information security risks in a comprehensive and standardised manner across all aviation domains. In addition, it is essential that the aviation industry and civil aviation authorities share knowledge and learn from experience to ensure systems are secure from individuals/organisations with malicious intent.

3.5 Incidents Data

3.5.1 Incident Data shared by States for the Period 2017-2021

Graph 24 below shows that the number of system component system-non-power plant (SCF-NP) incidents reported is the highest one, followed by Wake Turbulence, airborne conflict incidents (near mid-air collision) and birds. For an in-depth analysis and to identify the underlying safety issues, MID States should provide further safety information and safety analysis in order to come out with strategic initiatives and mitigations.

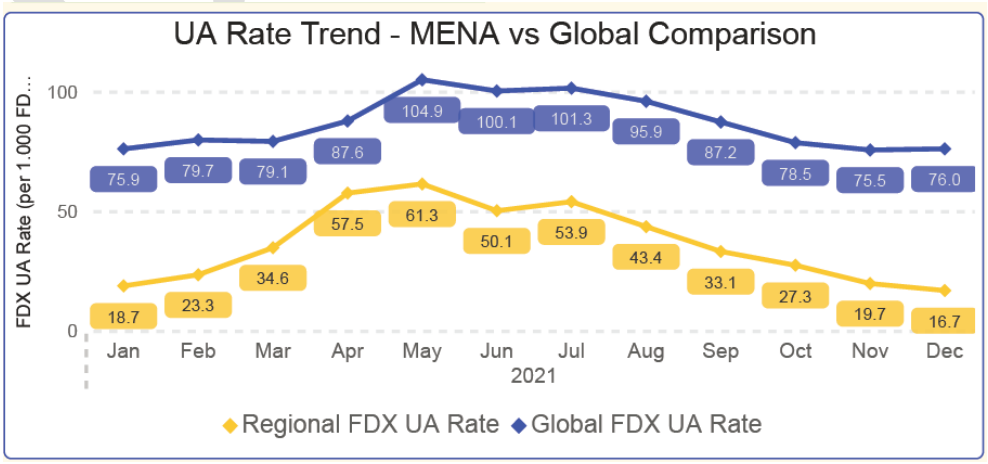


Graph 27: Total number of incidents provided by the MID States for the period 2017-2021

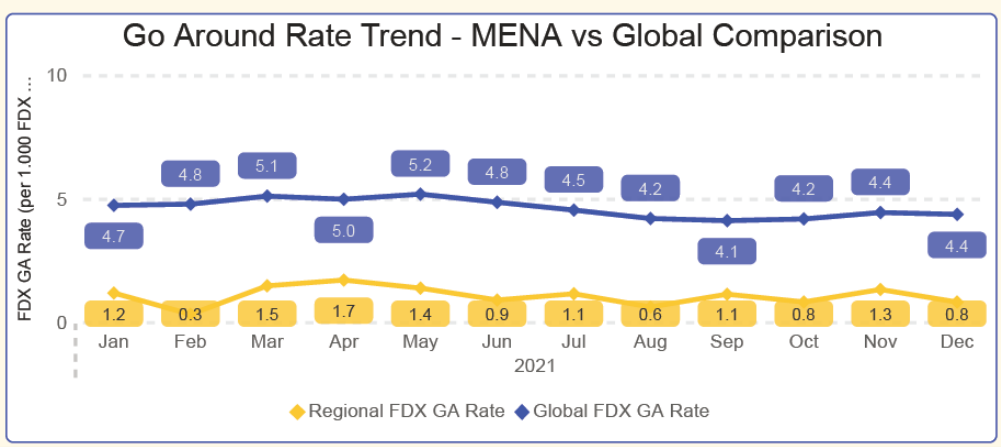
3.5.2 IATA FDX (Flight Data Exchange)

Unstable Approaches

Unstable Approaches / Go Around Flight Period: J a n 2 02 1 - D e c 2 02 1.
Q4 2021 rate in MENA was -44.52 % lower than previous 12 months

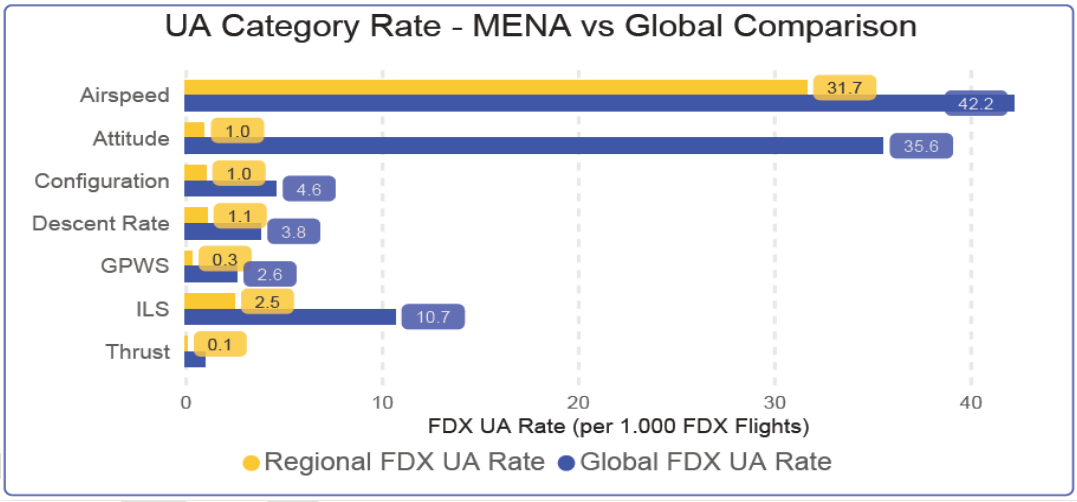


Graph 28: Unstable Approach Trend Rate

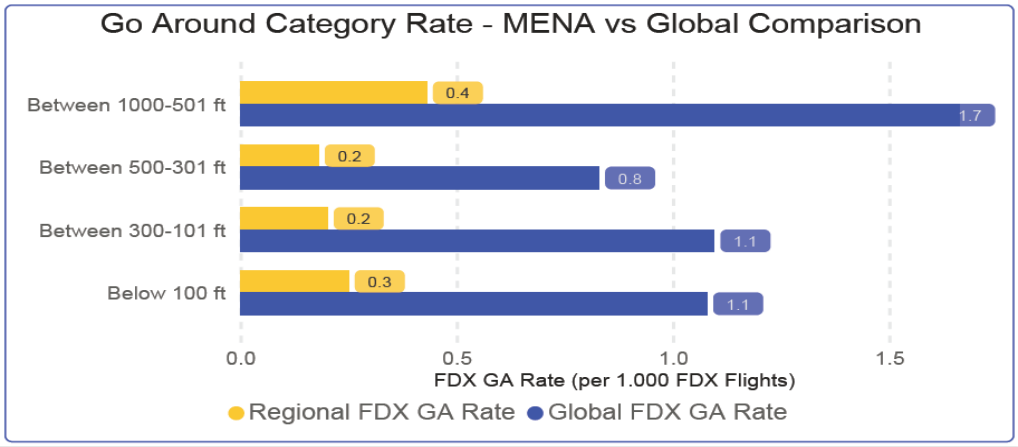


Graph 29: Go Around (GOA) Rate Trend: MENA Vs Global Comparaison

1% of MENA UA followed by GoA in FDX while 2.3% of Global UA followed by GoA in FDX.



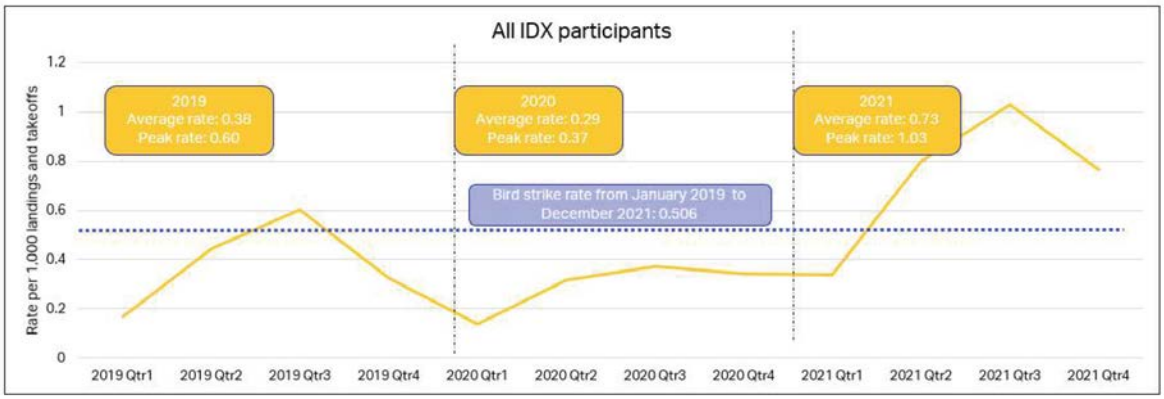
Graph 30: UA Category Rate– MENA Vs Global



Graph 31: GOA Category Rate – MENA Vs Global

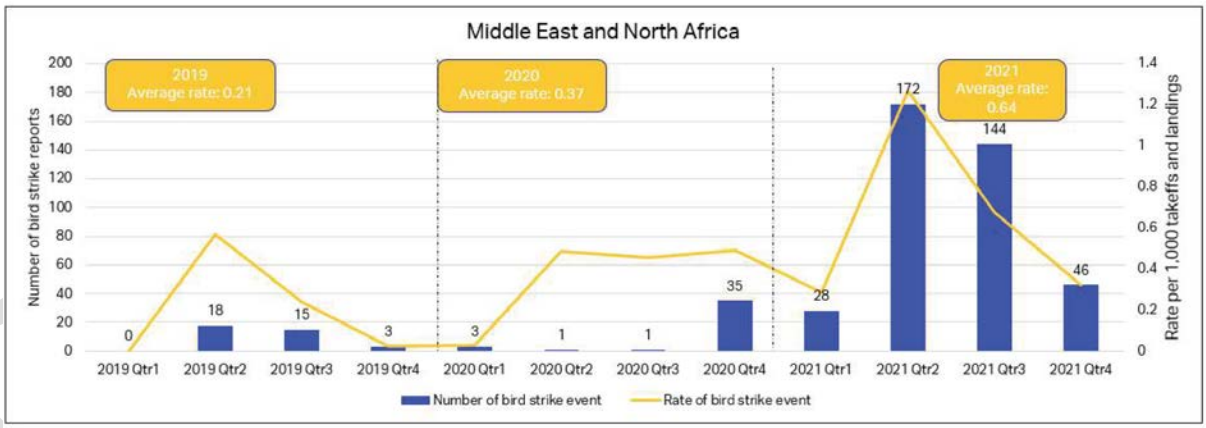
3.5.3 Bird Strike Analysis

This analysis is based on data extracted from IDX (Incident Data Exchange). Total **9,199 bird strike** reports have been extracted from January 2019 to December 2021 (36 months). Out of 119 operators who reported reports to IDX from January 2019 to December 2021, 71 operators (59.5%) reported at least one bird strike.



Graph 32: Global Bird Strike Report Trend

It was observed a decrease in the average bird strike rate **from 2019 (0.38) to 2020 (0.29)**, but then it increases significantly to **0.73 for 2021**.



Graph 33: MID Region Region Bird strike Trend

The average bird strike rate in MID Region increases from **0.21 in 2019 to 0.37 in 2020, then to 0.64 in 2021**.

3.6 IATA Data

3.6.1 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. The program aims to increase global safety performance and reduce the number of redundant auditing activities in the industry.

It has been almost 2 years since the beginning of the COVID-19 pandemic and as many airlines astoundingly proved their resilience throughout the period, likewise IOSA Audit Program has also proven its resilience over these challenging times. The program continued to provide safety assurance to the airline industry, a record number of **355 audits** were performed despite the pandemic's impact on air travel, closed borders, quarantine measures, and uncertainties.

The scope of the audit is determined by the ISOSA standards which cover Organization and Management (ORM),: and 7 disciplines; Flight Operations (FLT), Operational Control and Flight Dispatch (DSP), Aircraft Engineering and Maintenance (MNT), Cabin Operations (CAB), Ground Handling Operations (GRH), Cargo Operations CGO, and Security management (SEC).

IOSA Audit Methodology & Techniques

Internationally recognized and accepted; the IOSA safety audit program, focuses on conformity with ISARPs and also assesses the SMS effectiveness of the airlines. The IOSA program intends to detect and improve the barriers and hence the effectiveness of the audit methodologies and techniques are essential. Accordingly, in 2021, a mandatory observation for line maintenance operations was introduced to provide MNT auditors with an opportunity to observe line maintenance operations, review the use of MEL, and assessment of the repair status and the physical status of the aircraft as applicable.

Focus Area – B737 MAX Return to Service

The B737MAX's return to service was identified by IATA as a Focus Area and included in the Program. IOSA Auditors audited airlines with B737MAX and where necessary they increased their sample size to ensure that the B737MAX's return to service is managed or being managed properly with respect to relevant ISARPs.

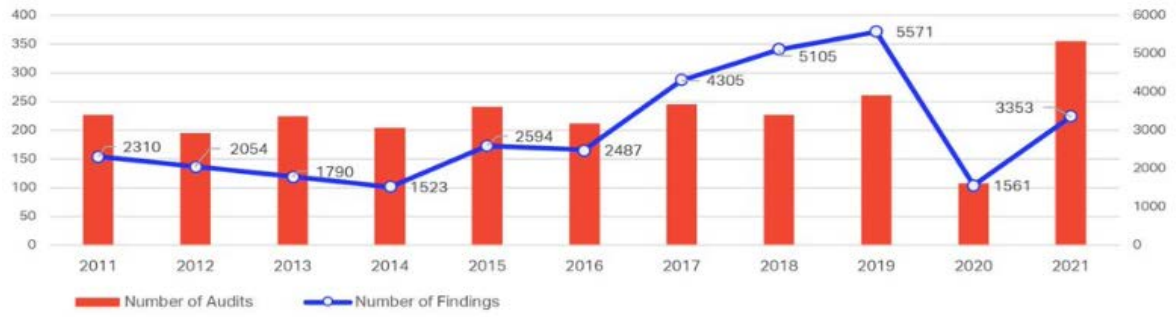
IOSA Support Program

In 2021, the Extenuating Circumstances for Audit Conduct option was phased out as of 1 May 2021, and starting from that date, airlines that ceased operations temporarily due to COVID-10 related reasons are suspended from the IOSA registry. In addition, upon demand by the industry, the requirement for submission of the IOSA Operator questionnaire (SAR.F23) decided to be continued. The questionnaire provided critical information to code-share partners and regulators alike. For airlines who had already undergone a first remote audit; a second remote audit option has been introduced if current government-imposed travel or entry restrictions continue to pose a limitation to onsite audits.

IOSA Audit Results

In 2021, a record number of 352 IOSA Audits have been conducted. These audits led to 3353 corrective actions to improve failed barriers (ISARPs) that are built for preventing incidents and accidents.

Distribution of findings compared to audits performed between 2011 - 2021

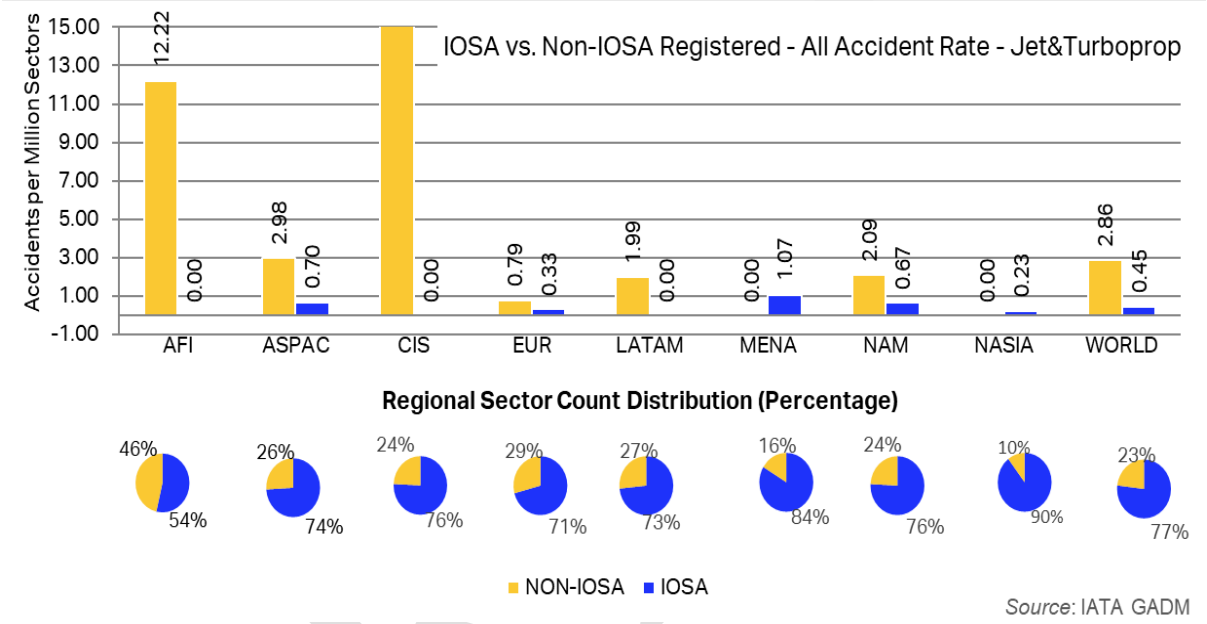


Note: *Due to Covid-19 pandemic, the number of IOSA Audits drastically reduced in 2020. In 2021, 180 of 355 audits were performed remotely with a checklist that includes a reduced number of ISARPs.*

Graph 34: Audits /Findings per year 2011-2021

IOSA Risk-based Audit Approach – The Program for the future

In today's dynamic environment, airlines require an IATA Operational Safety Audit (IOSA) that focuses on areas of potential safety risks rather than applying a 'one-size-fits-all' approach. Through the introduction of a risk-based approach in 2022, the audit scope will be tailored for each airline. Furthermore, the new approach introduces a maturity assessment of the airline's safety-critical systems and programs. Audit scoping will be based on a combination of industry standards and operator-specific elements such as operational profile, safety events, and the operator's IOSA audit history. In addition to the introduction of the maturity assessment, IOSA will continue to require a baseline of conformity with IOSA Standards and Recommended Practices. Following a period of transition, Risk Based IOSA will be the only IOSA audit program from 2025 onwards.

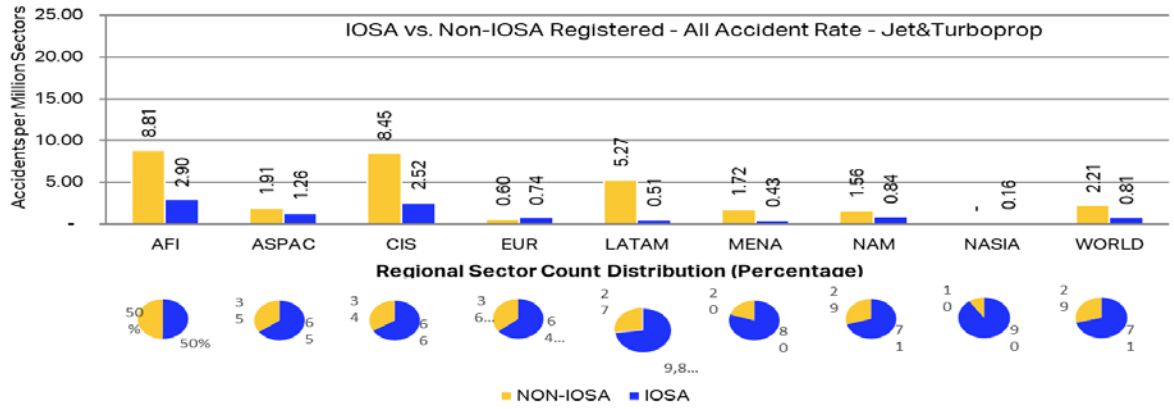


Source: IATA GADM

Graph 35: I Accident Rate (Jet & Turboprop) for IOSA Operators vs. Non-IOSA

The full year accident rate (Global) for all IOSA carriers in 2021 is lower than the rate for non-IOSA carriers (o.45 vs. 2.86).

All Accident Rate for IOSA vs. Non-IOSA: 2017- 2021



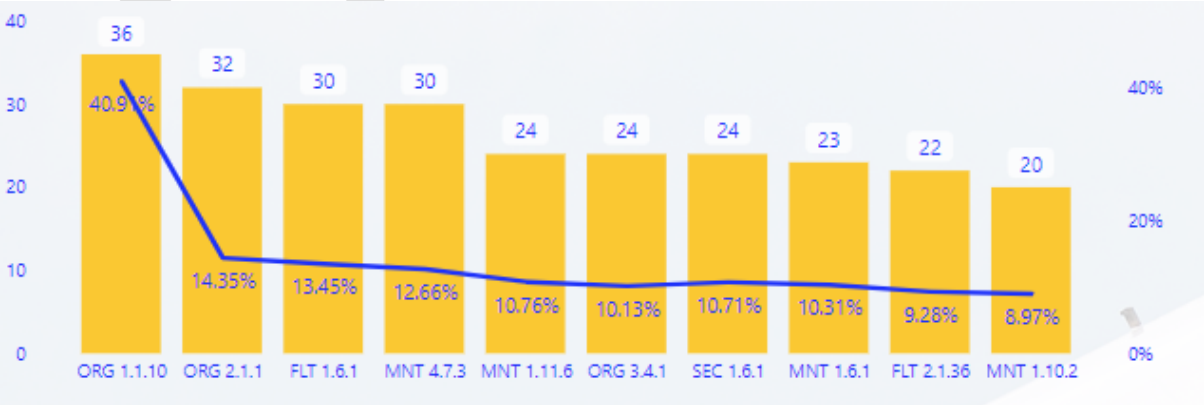
Graph 36: Accident Rate for IOSA vs. Non-IOSA: 2017- 2021

The 5 years average (2017-2021) shows IOSA registered airlines keep outperforming non-IOSA airlines (0.81 vs. 2.21).

During 2021, a total of 352 audits were performed under the IOSA Program of which 34 were initial audits. In the first quarter 2021, 91 audits performed which represent 167% increase from 2020 audits performed.

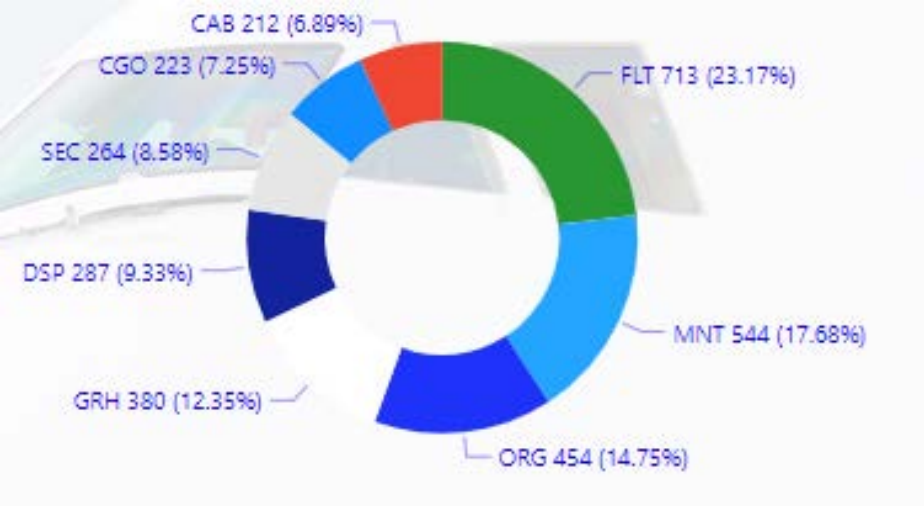
Graph 37: Global Number of audits 2021

Graph 38: Number of Audits conducted in MENA



Graph 39: IOSA Top Findings MENA Region 2021

Findings were mainly in the areas of Organization Management (ORG), Flight Operations (FLT) Control of documentations; Ground Handling Operations (GRH) and Cargo (Training of personnel) , around 86% of the Top 10 Finding are related to SMS implementation throughout the whole organization, and most of them are located at Organizational level. Above chart demonstrates the number of average findings per discipline:



Graph 40: Findings per Discipline MENA

3.6.2 IATA Safety Audit for Ground Operations (ISAGO)

The IATA Safety Audit for Ground Operations (ISAGO) is an industry global standard for the oversight and audit of ground service providers (GSPs). The primary objective to improve the safety of ground operations through implementation of standardized operational procedures and management system requirements by GSPs hence increasing the adoption of the harmonized industry best practices (BPs) amongst the ground handling stakeholders. ISAGO contributes towards better GSPs' performance and towards risk reduction in ground operations.

The scope of the audit is determined by the ISAGO standards which cover Organization and Management (ORM), and 5 disciplines: Load Control (LOD), Passenger & Baggage Handling (PAB), Aircraft Handling & Loading (HDL), Aircraft Ground Movement (AGM) and Cargo & Mail Handling (CGM).

Over 3000 audits conducted since the launch of the program in 2008. In **2021, 286** audits were completed; **88 audits (31%) were done remotely, 245 audits (84%)** were renewals. Remote audits were discontinued as of beginning of 2022. **63 audits were conducted in Q1, 2022**. The key areas, where most findings were identified, were:

- SMS implementation with several types of deficiencies in safety assurance and safety risk management.
- Training programs and records.
- Ongoing management control of documentation.
- Quality assurance.
- Oversight of external suppliers.

As of 1st of April 2022 there has been **193 ISAGO GSPs' Registration with 272 accredited stations**. **467** audit reports are available for airlines to complement their oversight system of outsourced ground operations services.

200 airlines responded to an IATA-ISAGO survey completed in January, 75 % being IATA members. The airlines indicated that ISAGO has positive impact on Safety performance of the GSPs, the program ensured that the ground handlers implemented SMS and it has been addressing the regulatory void by setting the ground operations standard benchmark.

IATA urged governments to recognize ISAGO in their regulatory frameworks for oversight and enable operators (AOC holders) to utilize ISAGO audit results to complement their own risk-based oversight systems. Significant benefits achieved, including greater harmonization, implementation of Safety Management Systems (SMS) by Ground handling organizations, and reduction of duplicate audits.

ISAGO checklists are being reworked to fully reflect auditing requirements against **IATA Ground Operations Manual (IGOM)** and **Airport Handling Manual (AHM)** (harmonized training requirements implementation).

IATA Ground Operations Manual (IGOM)

IGOM is the established global industry standard for ground handling worldwide. The IGOM Portal is an online platform where, with IGOM as the primary reference, airlines, and ground service providers (GSPs) can exchange information, including any variations on their ground handling requirements.

Safe and secure on-time turnarounds are a priority for airlines and a critical deliverable for GSPs. Standardization of procedures through the IGOM adoption is a key enabler that will be validated through ISAGO auditing scheme.

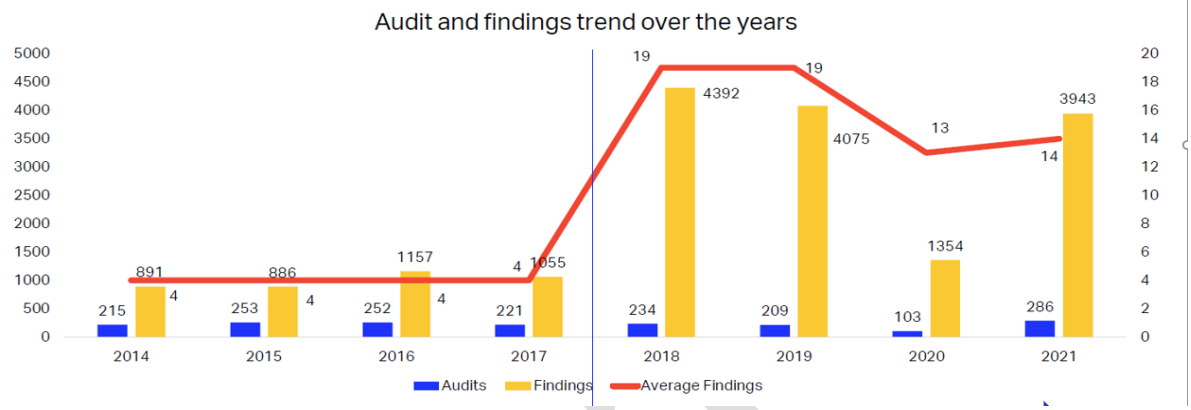
IATA launched the IGOM portal in September 2021 where airlines and ground handlers can share results of their gap analysis between company procedures and IGOM, offering a global benchmark for harmonization and efficiency. The IGOM portal brings the following benefits to airlines and GSPs:

- **Simplified verifiable communications**: A fully traceable notification and acknowledgment function facilitates communications between airlines and GSPs on IGOM variations.
- **Latest information**: Real time updates to the IGOM are immediately published on the portal.
- **Benchmarking**: A comparison function enables a digital gap analysis between IGOM requirements, and the manuals used by airlines and GSPs.
- **Network overview**: Local variations at all stations can be viewed for network overview of IGOM adoption.

3.6.2.1 Audit Result Analysis (Global)

The total audits performed in 2021 are 286 of which 88 audits were conducted remotely (30%) with an average of 14 findings raised per audit in graph 35 below.

ISAGO Findings Trend



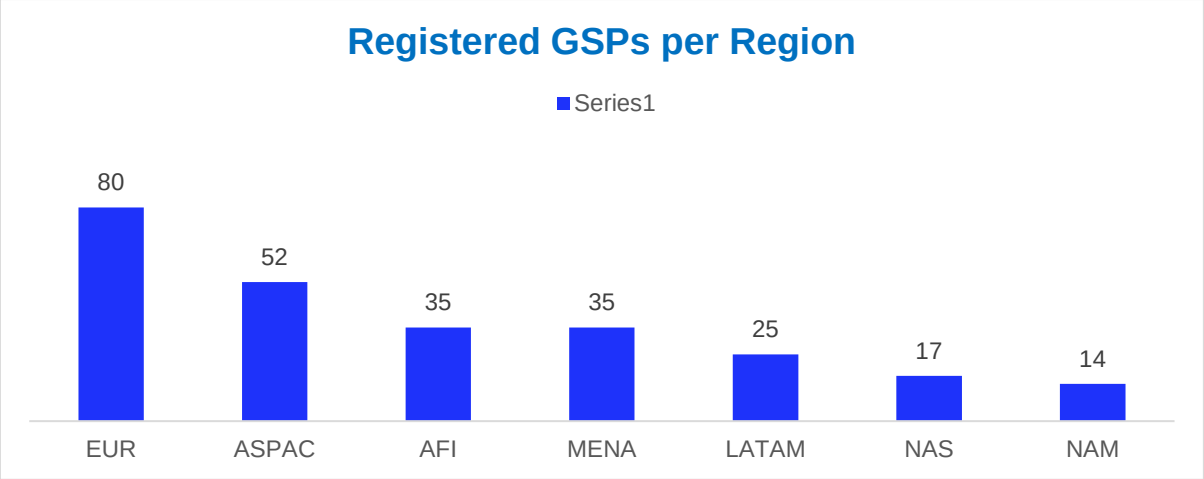
Graph 41: IATA Audit Result Analysis (Global)

We see in 2018 with the introduction of the new program of Chartered of Professional Auditor (CoPA) the quality of audits enhanced which resulted in increased number of findings. This gives GSP an opportunity to improve their operational and safety standards.

3.6.2.2 Audit Result Analysis per Region

In the Middle East and North Africa (MENA) a total of 36 audits were performed: 5 initial and 36 renewals.

GOSARP Code	Finding (#)	GOSARP Subject
ORM 1.1.3	71	SMS – integrated and implemented throughout organization to manage safety risks
ORM 3.1.1	38	Management and control of internal and external documentation
ORM 1.3.11	34	Safety assurance program including detailed audit planning and sufficient resources
ORM 1.3.4	29	SMS – Safety risk assessment and mitigation program
ORM 4.1.2	28	Training program to ensure personnel complete initial training before being assigned to operational duties
ORM 1.3.8	27	Closure of internal findings raised from QA program and station QC program
ORM 3.2.3	27	Documentation system – communication, distribution, and access
LOD 3.1.2	26	Accessibility of operational document at all stations with load control operations
ORM 1.6.1	25	Oversight of external suppliers
ORM 4.3.1	25	Training – Basic and specific SMS duties



Graph 42: IATA Audit Result Analysis per Region

In the MID Region there are 35 **GSEs** are ISAGO-Registered operating at 38 stations in 19 Airports.

3.7 Region Safety Performance - Safety Indicators-Proactive

3.7.1 Goal 2: Strengthen States' Safety Oversight Capabilities/Progressively Increase the USOAP-CMA EI Scores/Results:

Safety Indicator	Safety Target	MID	Remark
A. Regional average EI	a. Increase the Regional average EI to be above 70% by **2020**	**74,67%**	Target Achieved
B. Number of MID States with an overall EI over 60%.	11 MID States to have at least 60% EI **by 2020**	10 States	
C. Regional average EI by area	c. Regional average EI for each area to be above 70% by **2020**	6 areas	
D. Regional average EI by CE	d. Regional average EI for each CE to be above 70% by **2020**	5 CEs	
E. Number of Significant Safety Concerns	MID States resolve identified Significant Safety Concerns as a matter of urgency and in any case within 12 months from their identification. No significant Safety Concern by **2016**.	None	Target Achieved

Table 9: Goal 2

3.7.2 Goal 3: Ensure Appropriate Infrastructure is available to Support Safe Operations

Safety Indicator	Safety Target	MID	Remark
Number of certified International Aerodrome as a percentage of all International Aerodromes in the MID Region	A. 50% of the international aerodromes certified by 2015.	58,62%	
	B. 75% of the international aerodromes certified **by 2017**.		
Number of established Runway Safety Team (RST) at MID International Aerodromes.	50% of the International Aerodromes having established a RST **by 2020**	**68,97%**	Target Achieved

Table10: Goal 3

3.7.3 Goal 4: Expand the use of Industry Programmes

Safety Indicator	Safety Target	MID	Remark
Use of the IATA Operational Safety Audit (IOSA), to complement safety oversight activities.	A. Maintain at least 60% of eligible MID airlines to be certified IATA-IOSA at all times.	57% (As of Sep 2017)	
	B. All MID States with an EI of at least 60% use the IATA Operational Safety Audit (IOSA) to complement their safety oversight activities by **2018**	6 out of 10 States (60%)	
Use of the IATA Safety Audit for Ground Operations (ISAGO) certification, as a percentage of all Ground Handling service providers	The IATA Ground Handling Manual (IGOM) endorsed as a reference for ground handling safety standards by all MID States **by 2020**	6 states out of 10 signed ISAGO MOU 60%	

Table11: Goal 4

3.7.4 Goal 5: Implementation of Effective SSPs and SMSs:

Safety Indicator	Safety Target	MID	Remark
Number of States that have completed the SSP Gap Analysis on iSTARS	13 MID States by 2020	9 States	
Number of States that have developed an SSP implementation plan	13 MID States by 2020	9 States	
Regional Average overall SSP Foundation (in %)	70% by 2022	**76.18%**	Target achieved
Number of States that have fully implemented the SSP Foundation	10 MID States by 2022	1 State	
Number of States that have implemented an effective SSP	7 MID States by 2025	TBD	
Number of States that have published a national aviation safety plan (NASP)	13 States by 2025	4	

Table 12: Goal 5

3.7.5 Goal 6: Increase Collaboration at the Regional Level to Enhance Safety:

Safety Indicator	Safety Target	MID	Remark
Number of States attending the RASG-MID meetings	At least 12 States from the MID Region	**15 States**	Target achieved
Number of States providing required data related to accidents, serious incidents and incidents to the MID-ASRG	All States from the MID Region	6 States	
Number of States that received assistance/support through the RASG-MID, MENA RSOO and/or other NCLB mechanisms	All States having an EI below 60% to be member of the MENA RSOO	TBD	
	All States having an EI below 60% to have an approved NCLB Plan of Actions for Safety (agreed upon with the ICAO MID Office)	3 States	

Table 13: Goal 6

4. Safety Priorities for MID Region

One of the GASP goals is for States to improve their effective safety oversight capabilities and to progress in the implementation of SSPs. Thus, GASP calls for States to put in place robust and sustainable safety oversight systems that should progressively evolve into more sophisticated means of managing Safety. In addition to addressing organizational/systemic safety issues, GASP addresses high-risk categories of occurrences, which are deemed global safety priorities. These categories were determined based on actual fatalities from past accidents, high fatality risk per accident or the number of accidents and incidents. Therefore, the Regional operational Safety risks, organizational issues, and the emerging safety risks will be defined and which would support and improve the development of the Safety Enhancement Initiatives (SEIs).

4.1 Regional Operational Safety Risks

Operational safety risks arise during the delivery of a service or the conduct of an activity (e.g. operation of an aircraft, airports or of air traffic control). Operational interactions between people and technology, as well as the operational context in which aviation activities are carried out are taken into consideration to identify expected performance limitations and hazards.

The reactive and proactive safety information provided by ICAO, IATA, MID Region States and the safety risk portfolio were considered for identifying the Regional operational risks . Table14 shows that each identified safety issue is mapped to its respective potential accident outcome (s), and the safety risk Portfolio for the MID Region as follow:

Potential Accident Outcome							
Safety Issues	**CFIT**	**LOC-I**	**MAC**	**GCOL**	**RE/ARC**	**Injury Damage inflight**	**Injury Damage on Ground**
Monitoring of flight paremeters and automation modes	x	x			x		
Adverse Convective weather	x	x			x	x	
Un-stabilized Approach		x			x		x
Flight planning and preparation	x	x	x	x	x		
Crew Resource Management	x	x	x	x	x		
Handling of technical failure	x	x		x	x		x
Handling and execution of GOA	x	x			x		
Loss of separation in flight/ and/or airspace/TCAS RA			x			x	
Experience, training and competence of Flight Crews	x	x	x		x		
Deconfliction between IFR and VFR traffic			x				
Inappropriate flight control inputs		x			x		
Fatigue	x	x					
Entry of aircraft performance data		x					
Contained engine Failure/Power Plant Malfunctions		x			x	x	
Birdstrike/Engine Bird ingestion		x			x		
Fire/Smoke-non impact		x				x	

Potential Accident Outcome							
Safety Issues	**CFIT**	**LOC-I**	**MAC**	**GCOL**	**RE/ARC**	**Injury Damage inflight**	**Injury Damage on Ground**
Wake Vortex		x				x	
Deviation from pitch or roll attitude	x	x			x		
Security Risks with impact on Safety		x					
Tail/Cross wind/Winds hear		x			x		x
Runway Incursion				x	x		x
Maintenance events	x	x				x	
Contaminated runway/Poor braking action					x		x
Clear Air Turbulence (CAT) and Montain Waves		x				x	

Table 14: Safety Risk Portfolio

First, Considering ICAO reactive safety information, the Regional operational safety risks identified were the Loss of Control-in Flight (LOC-I) and runway safety (RE/ARC). It is also to be noted that for the Abrupt Manoeuver (AMAN) occurrence category, the flightcrew received TCAS RA and applied high rate of climb according to the TCAS display to prevent Mid air collision with military aircraft which caused injuries to some persons on board. Therefore, the MAC occurrence category was also considered as a HRC. Considering also the reactive and proactive safety information, safety issues identified which could lead to the potential accident outcomes of Controlled Flight Into Terrain (CFIT), Mid Air Collision (MAC), and runway incursion (RI) as detailed in the above safety risk portfolio. Therefore, the CFIT, MAC, RI were also considered as Regional operational safety risks due to the potential risk of these type of accidents though the MID States did not experience those accidents during the period 2017-2021.

Based on the analyses of reactive and proactive safety information, it is concluded that the Regional operational safety risks for the MID Region are:

1. Loss of Control-In Flight (LOC-I);
2. Runway Safety (RS); mainly (RE and ARC during landing);
3. Mid-Air Collision (MAC);
3. Controlled Flight into Terrain (CFIT); and
5. Runway incursion (RI).

In addition to this, main safety issues have been identified and mapped to their respective potential outcomes as detailed in the table 14.

1. Loss of control inflight (LOC-I)

Loss of control usually occurs because the aircraft enters a flight regime that is outside its normal envelope, usually, but not always, at a high rate, thereby introducing an element of surprise for the flight crew involved. Prevention of loss of control is a strategic priority. During 2017-2021 aircraft upset, or loss of control contributed to one fatal accident.

2. Runway Excursions (RE):

RE is a veer or overrun off the runway surface. RE events can happen during take-off or landing. During the period 2017-2021, Runway Excursions and abnormal runway contact accidents and serious incidents mainly occurred in the landing phase of flight. In addition, High Airspeed and Low Engine Thrust identified as key contributing factors to the Unstable Approaches Events.

3. MID-Air Collision (MAC)

Refers to the potential collision of two aircraft in the air. It includes direct precursors such as separation minima infringements, genuine TCAS resolution advisories, or airspace infringements. During 2020, no mid-air collision accident has been recorded. However, the flightcrew received TCAS RA and applied high rate of climb according to the TCAS display to prevent Mid air collision with military aircraft which caused injuries to some persons on board. In addition, this key risk area has been raised by some MID States specifically in the context of the collision risk posed by military aircraft operating in Gulf area over the high seas which are not subject to any coordination with related FIRs for airborne operation. This is one specific safety issue that is the main priority in this key risk area. However, additional safety data and safety information are needed for further analysis to identify the underlying safety issues.

4. Controlled Flight Into Terrain (CFIT)

It comprises those situations where the aircraft collides or nearly collides with terrain while the flight crew has control of the aircraft. It also includes occurrences, which are the direct precursors of a fatal outcome, such as descending below weather minima, undue clearance below radar minima, etc. There was no fatal accident involving MID States operators during this period. This key risk area has been raised by some MID States and in other parts of the world that make it an area of concern. However, additional safety data and safety information are needed for further analysis to identify the underlying safety issues.

5. Runway incursion (RI)

A Runway Incursions refers to the incorrect presence of an aircraft, vehicle or person on an active runway or in its areas of protection. Their accident outcome is runway collisions. While there were no fatal accidents or accidents involving MID States operators in the last years involving runway collision, the risk of the reported occurrence demonstrated to be very real. In addition to this, MID States should provide further safety data and safety information regarding runway incursion to identify the root causes and associated safety issues.

4.2 Organizational issues

Organizational issues are systemic issues which take into consideration the impact of organizational culture, and policies and procedures on the effectiveness of safety risk controls. Organizations include entities in a State, such as the civil aviation authority (CAA) and service providers, such as operators of aeroplanes, ATS providers, and operators of aerodromes. Organizations should identify hazards in systemic issues and mitigate the associated risks to manage Safety. A State's responsibilities for the management of Safety comprise both safety oversight and safety management, collectively implemented through an SSP.

4.2.1 Improve States' Safety Oversight Capabilities

USOAP-CMA audits had identified that State's inability to effectively oversee aviation operations remains a global concern. In respect of MID Region, the Regional average overall Effective Implementation (EI) (13 out of 15 States have been audited) is approx. 75 %, which is above the world average 68.68 % (as of 29 May 2022). Three (3) States are currently below EI 60%.

All eight areas have an EI above 60%. However, the areas of AIG and ANS still need more improvement. Regarding the Critical Elements (CEs), CE4 (Qualified technical personnel) improved and is above 60% (62.39%) EI, whereas CE8 (resolution of safety issues) is the only one below EI 60% (58. 89%) EI.

Moreover, the effective implementation in certification, surveillance, and resolution of Safety concerns need to be improved.

4.2.2 Improve Safety Management

States should build upon fundamental safety oversight systems to fully implement SSPs according to Annex 19; States shall require that applicable service providers under their authority implement an SMS. The average EI for SSP foundation PQs for States in the MID Region is 76, 18%.

An SSP requires increased collaboration across operational domains to identify hazards and manage risks. Aviation authorities and organizations should anticipate new emerging threats and associated challenges by developing SRM principles. Implementation of SSP is one of the main challenges faced by the State in the MID Region. The RASG-MID addresses the improvement of SSP implementation in the MID Region as one of the top Safety Enhancement Initiatives (SEIs). In connection with this, the RASG-MID/9 endorsed the Safety Management Implementation Team (SMIT) handbook to support MID States in the implementation of the SSP in an effective and efficient way. Moreover, the RASG-MID also supported the establishment and activation of the MENA RSOO, with a primary objective to assist member States to develop and implement SSP; and Several Safety Management Workshops, training courses, and meetings have been organized to support the implementation of SSP/SMS and address the challenges and difficulties, as well as sharing of experiences and best practices.

4.2.3 Human Factors and Competence of Personnel

As new technologies emerge on the market and the complexity of the system continues increasing, it is of key importance to have the right competencies and adapt training methods to cope with new challenges. CRM has been identified as most important human factors issue in the domain of commercial air transport and safety actions would be identified and developed.

4.2.4 Cybersecurity

The global civil aviation ecosystem is accelerating towards more digitalisation. This implies that any exchange of information within any digital workflow of the aviation community needs to be resilient to information security threats which have consequences on the safety of flight or the availability of airspace and beyond. Aware of the complexity of the aviation system and of the need to manage the cybersecurity risk the MID Region needs to consider and address information security risks in a comprehensive and standardised manner across all aviation domains. In addition, it is essential that the aviation industry and civil aviation authorities share knowledge and learn from experience to ensure systems are secure from individuals/organisations with malicious intent.

4.3 Emerging Safety Risks

Emerging safety issues are risks that might impact Safety in the future, these may include a possible new technology, a potential public policy, a new concept, business model or idea that, while perhaps an outlier today, could mature and develop into a critical mainstream issue in the future or become a major trend in its own right. Therefore, it is important that the international aviation community remain vigilant to identify emerging safety issues and develop mitigations to address them. Failure to address emerging safety issues can affect a State, Region or industry's ability to mitigate the safety risks.

4.3.1 GNSS Outages/ Vulnerability

GNSS/GPS Interference Reported in MENA Region 2021

GNSS is a key technology of the Communications, Navigation, and Surveillance (CNS) infrastructure. GNSS can support navigation applications in all phases of flight as well as surveillance application like ADS-B. GNSS is also used in safety nets like the EGPWS (Enhanced Ground Proximity Warning Systems) and provides the time reference that is used to synchronize systems and operations in ATM.

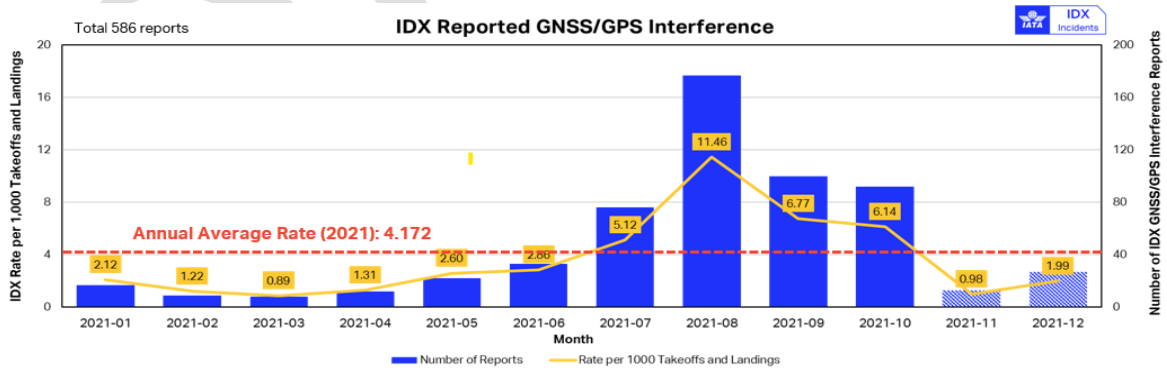
GNSS/GPS vulnerability, including intentional and unintentional signal interference, has been identified as a major safety issue.

Therefore, such interference needs to be monitored and its operational risk needs to be assessed. GADM IDX program enables identifying hot spots and trends of reported GNSS/GPS interference reports. Furthermore, GADM NOTAM repository enables tracking of any NOTAMs issued by States to inform potential GNSS/GPS Interferences to Airspace Users. To monitor the potential GNSS/GPS interference risk, IATA FDX program **introduced new event of GPS outage from August 2021**.

In a continuous monitoring the Regional safety risk of GNSS/GPS Interference, this analysis is presented to provide updated figure until 2021 December of GNSS/GPS Interference in MENA and adjacent countries.

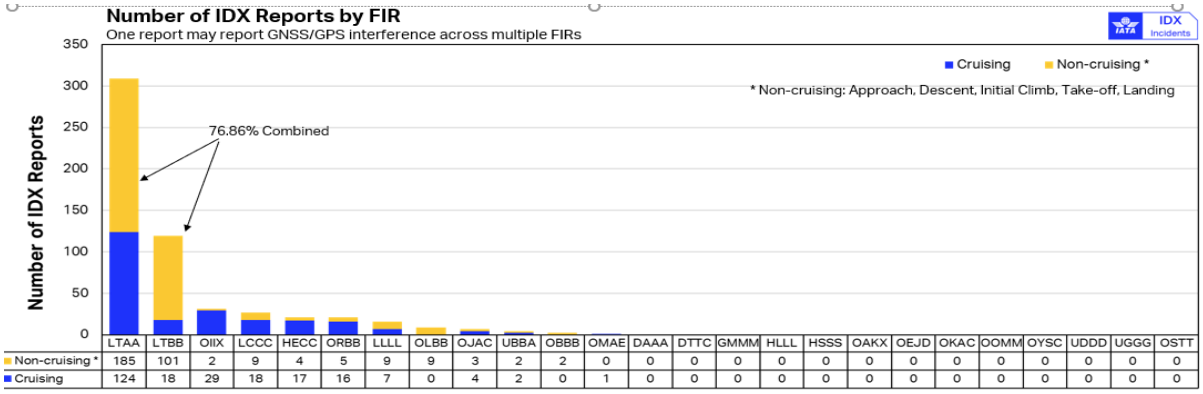
IATA Incident Exchange Database (IDX):

Total 586 GNSS/GPS jamming or suspected interference reports from MENA and adjacent States have been reported by 15 operators in Incident Data Exchange (IDX).



Graph 43: Location of Reported GNSS/GPS Interference

The number of GNSS/GPS interference reports has increased significantly during June ~ August 2021, peaked in August with the rate of 11.46 per 1,000 takeoffs and landings. Afterwards, the rate of GNSS/GPS Interference has been decreased to 6.77 and 6.14 in September and October, then dropped below than the annual average of 4.17 in November and December.



	LTAA	LTBB	OIIX	LCCC	HECC	ORBB	LLLL	OLBB	OJAC	UBBA	OBBB	OMAE	DAAA	DTTC	GMMM	HLLL	HSSS	OAKX	OEJD	OKAC	OOMM	OYSC	UDDD	UGGG	OSTT
Non-cruising *	185	101	2	9	4	5	9	9	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cruising	124	18	29	18	17	16	7	0	4	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

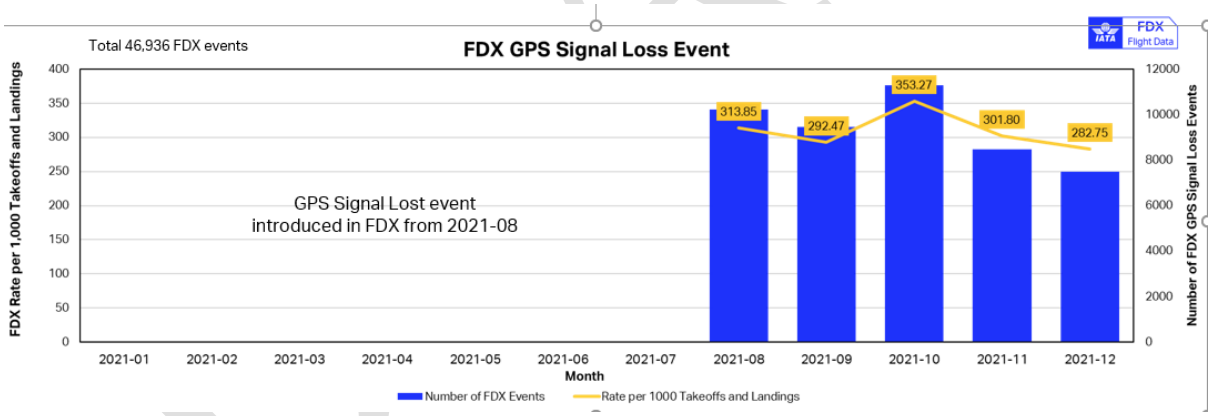
Graph 44: Distribution of GNSS/GPS Interference by FIR

76.86% of all GNSS/GPS Interference reports was collected in Turkish FIRs. Notably, the number of reports in LTBB (Istanbul FIR) has significantly increased compared to previous analysis.

Flight Data Exchange (FDX):

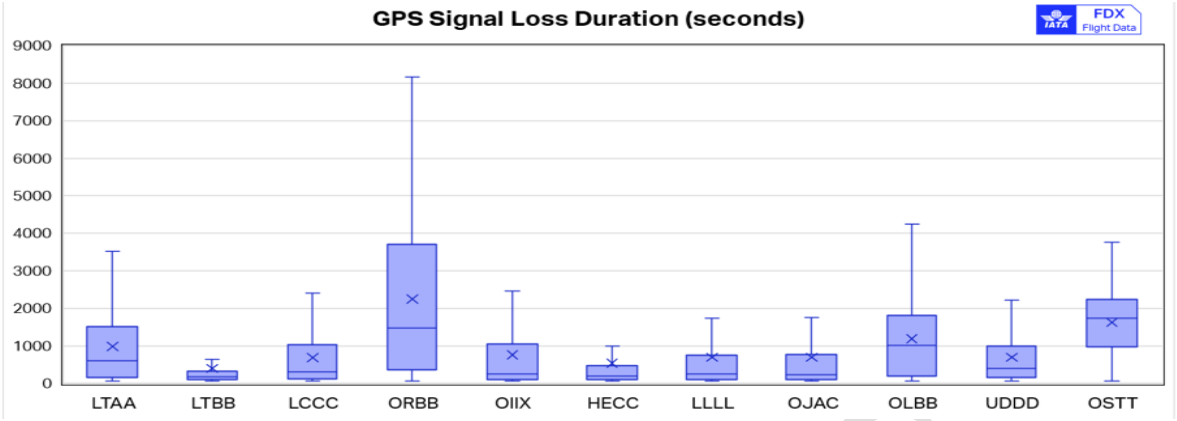
Total 46,936 GPS signal lost events from 38 operators from MENA and adjacent States have been extracted from Flight Data Exchange (FDX) dataset.

The FDX rate shows relevantly consistent event rate from August to December 2021. Considering (1) the number of FDX events (46,936 events) was larger than IDX reports (586 reports), as the number of FDX operators was higher (38 operators) than the ones from IDX (15 operators) and the difference of data collection methods, where IDX event relies on voluntary reporting from crew, while FDX event is captured automatically from the flight data recorder.



Graph 45: FDX GPS Signal Loss Event

Majority of GPS Signal Lost was detected within or in vicinity of Turkish airspace (Ankara FIR and Istanbul FIR), and in Eastern Mediterranean area. Compared to previous analysis, the identified hot spots have been expanded into entire Anatolian peninsula, including Istanbul FIR (LTBB).



Graph 46: GPS Signal Loss Duration (Seconds)

Sorting by average seconds of GPS Signal Lost duration in descending order, ORBB (Baghdad FIR) had the longest duration, in average of 2,251 seconds, followed by OLBB (Beirut FIR) with 1,184 seconds, LTAA (Ankara FIR) with 984 seconds, OIIX (Tehran FIR) with 760 seconds, OJAC (Amman FIR) with 699 seconds, LLLL (Tel-Aviv FIR) with 697 seconds, UDDD (Yerevan FIR) with 691 seconds, LCCC (Nicosia FIR) with 687 seconds, HECC (Cairo FIR) with 536 seconds and LTBB (Istanbul FIR) with 402 seconds.

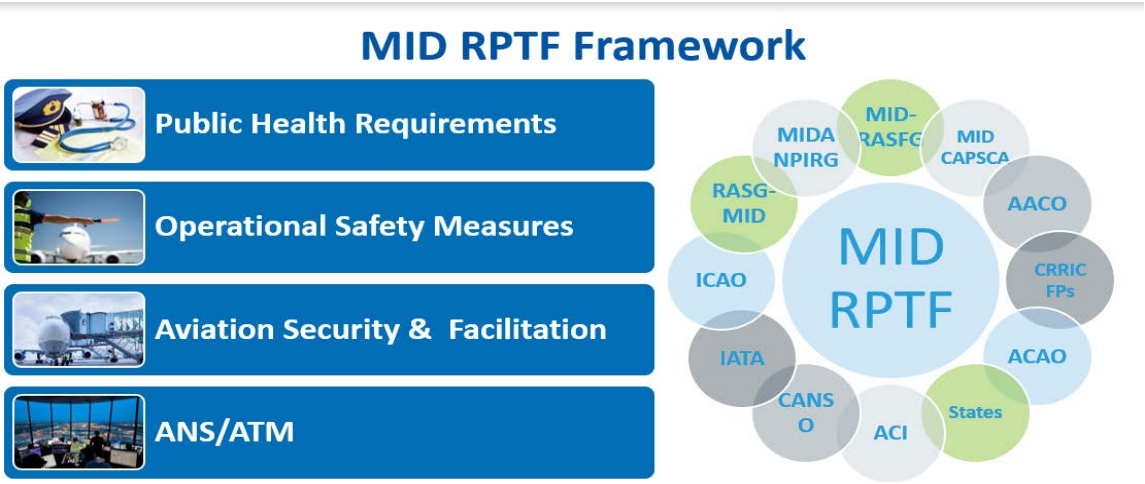
NOTAM

105 GNSS/GPS interference NOTAMs were extracted from NOTAM archive issued over MENA States. In most of the FIRs with reported GNSS/GPS Interferences, there were active NOTAMs warning the operators about potential GNSS/GPS Interference risk. However, In Istanbul FIR on 2021 June, Baghdad FIR on 2021 July ~ August, there were no NOTAM warning operators about the GNSS/GPS Interference risk.

4.3.2 COVID-19 Pandemic Outbreak

The impact of the coronavirus disease (COVID-19) pandemic on global air transport is without precedent. It was noted that the rapidly evolving COVID-19 crisis heavily affected all aspects of civil aviation. The urgent need to coordinate all efforts to reduce the risks of the spread of COVID-19 by air transport and to protect the health of air travellers and aviation personnel, while maintaining essential aviation transport operations and ensuring an orderly return to normal operations in due course was underlined. In connection with this, the High-Level MID Regional virtual Meeting between ICAO, AACO, ACAO and IATA on COVID-19 Crisis Management came out with proposal to establish a MID Region Recovery Plan Task Force (MID RPTF) which was then endorsed by the Middle East DGCA virtual Meeting held on 23 April 2020.

In order for the MID-RPTF to provide support and targeted assistance to States in line with the MID CART Implementation Plan, would allow sharing of information about common challenges and best practices related to the implementation of CART recommendations and measures and avoid duplication of efforts, the 21st MID RPTF meeting proposed to include the States CRRIC Focal Points and States Representatives in the MID RPTF membership and agreed to amend the MID RPTF Terms of Reference (TORs). The meeting supported the updated MID RPTF TORs, which was finalize by the 22nd MID RPTF virtual meeting, and encouraged States and Stakeholders to support the MID RPTF activities. The revised MID RPTF Term Of reference (TORs) has been endorsed by the 4th Virtual DGCA meeting.



Graph 47: MID RPTF Composition and Framework

The MID-RPTF mechanisms continued to serve as a platform for coordination and cooperation amongst all stakeholders to support States with the implementation of the CART and HLCC recommendations as well as the recovery of aviation industry in the MID Region during the COVID-19 pandemic outbreak.

The MID RPTF framework was established to include 4 technical work streams namely: Public Health Requirements, Operational Safety Measures, Avaition security and Facilitation, and Air Navigation Services/Air Traffic Management. Each work stream identifies its key activities and their respective actions and deliverables/outcomes to be presented to the MID RPTF meetings.

The MID RPTF composition includes the Chairpersons of MIDANPIRG, RASG-MID, MID-RASFG and CAPSCA-MID; States representatives; States CRRIC Focal points; Representatives from the Regional and International Organizations (AACO, ACAO, ACI, CANSO, IATA, ICAO, IFALPA, and IFATCA); and Operators, and/or Service Providers may be invited to participate in the MID RPTF meetings, as required.

The key activities undertaken covered mainly aspects related to continuous coordination with all stakeholders, to ensure well harmonized implementation of the measures to support to restart and recovery of the aviation system in MID Region; Continuous support to States on the use of TE system; facilitation to the CAPSCA programme implementation; identifying and addressing States needs and operational challenges; monitoring status of implementation of the CART Recommendations through CRRIC and providing required assistance to States for the posting of relevant information; Continuous sharing, communication and promotion of developed guidance material and best practices with MID States and stakeholders on operational safety measures, CAPSCA, AVSEC/FAL and ANS/ATM aspects; Coordinating exchange of information and experience between States; and supporting the planning for the post COVID-19 pandemic recovery and the restart of aviation operations; and supporting the planning for the post COVID-19 pandemic recovery and the restart of aviation operations.

From the onset of the coronavirus disease 2019 (COVID-19) crisis, the aviation system has faced ever-growing challenges. The International Civil Aviation Organization (ICAO), through the Council Aviation Recovery Task Force (CART), has resolved to partner with its Member States, international and Regional organizations, and industry to address these challenges and to provide global guidance for a safe, secure and sustainable restart and recovery of the aviation sector. The ICAO CART developed and issued CART I, CART II, CART III, and CART IV Reports and the associated “Take-Off Guidance Document” (TOGD).

Graph 48: MID CART Implemnttaion Plan

The MID-RPTF contributed to the development and would also continue to foster and support the implementation of MID CART implementation plan and associated MID Regional Groups CART implementation plans of actions.

The revised MID CART Implementation Plan, which was endorsed by the Fifth DGCA-MID Virtual (21-22 September 2021) meeting, is developed in line with and in support of the Global Implementation Roadmap (GIR) to contribute to the restart and recovery of the civil aviation system by establishing and enabling a framework for an effective implementation of the recommendations and guidance outlined in the CART Report and the associated "Take-Off Guidance Document" (TOGD).
The MID CART implementation Plan is developed based on the following main 3 pillars namely Communication, Coordination and Collaboration; Implementation Support; and Monitoring and Reporting.

The MID CART Implementation Plan addresses all areas covered in the CART Report by following the key principles and the guiding considerations outlined in the TOGD, in particular the principle of 'working as one aviation team'. In support to the GIR, the MID Region initiatives will be compiled on the online interactive roadmap accessible through the COVID-19 Response and Recovery Implementation Centre (CRRIC).

Roadmap to OPS Normal Guidance Website
At the start of the COVID-19 pandemic, alleviations to the Standards of the Annexes were established as interim measures to support continued operations. As interim measures, such alleviations could not sustain safe operations indefinitely and a return to normal operations (albeit a 'new' normal) is now underway. Consequently, those alleviations, and the guidance for use provided in the associated QRGs, were withdrawn. This section provides guidance for the recommencement of operations conducted within the constraints posed by COVID-19 conditions but that remain in line with the requirements of the SARPs. https://www.icao.int/safety/OPS/OPS-Normal/Pages/default.aspx

4.3.3 Ensure the Safe Operations of UAS (drones)

The number of drones at the global level has increased. Available evidence demonstrates an increase of drones coming into close proximity with manned aviation (both aeroplanes and helicopters) and the need to mitigate the associated risk. The civil aviation authority is responsible for, inter alia, ensuring aviation safety and protecting the public from aviation hazards. However, additional safety data and safety information are needed for further analysis to identify the underlying safety issues.

4.3.4 Impact of Security on Safety

The crash of flight MH17 immediately raised the question why the aero plane was flying over an area where there was an ongoing armed conflict. Similar events had occurred in the MID Region. Thus, military or terrorist conflicts may occur in any State at any time and pose risks to civil aviation. This is why it's important for governments, aircraft operators, and other airspace users such as air navigation service providers (ANSPs), to work together to share the most up-to-date conflict zone risk-based information possible to assure the safety of civilian flights. Similar events had occurred in the MID Region on Jan 2020 involving the Ukraine International Airlines flight PS752.

4.3.5 5G interference with Radio Altimeter

Radar altimeters (RA), operating at 4.2-4.4 GHz, are the only sensors onboard a civil aircraft which provide a direct measurement of the clearance height of the aircraft over the terrain or other obstacles (i.e. the Above Ground Level - AGL - information).

The RA systems' input is required and used by many aircraft systems when AGL is below 2500 ft. Any failures or interruptions of these sensors can therefore lead to incidents with catastrophic outcome, potentially resulting in multiple fatalities. The radar altimeters also play a crucial role in providing situational awareness to the flight crew. The measurements from the radar altimeters are also used by Automatic Flight Guidance and Control Systems (AFGCS) during instrument approaches, and to control the display of information from other systems, such as Predictive Wind Shear (PWS), the Engine-Indicating and Crew-Alerting System (EICAS), and Electronic Centralized Aircraft Monitoring (ECAM) systems, to the flight crew.

There is a major risk that 5G telecommunications systems in the 3.7–3.98 GHz band will cause harmful interference to radar altimeters on all types of civil aircraft- including commercial transport airplanes; business, regional, and general aviation airplanes; and both transport and general aviation helicopters. If there is no proper mitigation, this risk has the potential for broad impacts to aviation operations in the United States as well as in other regions where the 5G network is being implemented next to the 4.2-4.4 GHz frequency band.

List of potential equipment failures:
Auto land functions, EICAS/ECAM, False or missing GPWS alert, Unreliable instrument Indications, and Abnormal behaviors in Automatic Flight Systems.

5. Final Conclusions

One of the GASP goals is for States to improve their effective safety oversight capabilities and to progress in the implementation of SSPs. In addition to addressing organizational/systemic safety issues, GASP addresses high-risk categories of occurrences, which are deemed global safety priorities. These categories were determined based on actual fatalities from past accidents, high fatality risk per accident, or the number of accidents and incidents.

Following the analysis of the reactive and proactive/predictive safety information provided by ICAO, IATA, and the MID Region States for the period 2017 - 2021, it was concluded that the safety priorities defined for the MID Region are:

A. Regional operational Safety risks

1. Loss of Control-Inflight (LOC-I);
2. RE and ARC during landing;
3. Mid-Air Collision (MAC)
4. Controlled Flight Into Terrain- (CFIT); and
5. Runway incursion (RI).

B. Organizational issues:

1. States' Safety Oversight capabilities;
2. Safety Management;
3. Human factors and competence of personnel; and
4. Cybersecurity

C. Emerging Safety risks

1. GNSS outage;
2. COVID-19 Pandemic outbreak;
3. Ensure the safe operations of UAS (drones);
4. Impact of security on safety; and
5. 5G interference with Radio Altimeter

The Middle East Regional Aviation Safety Plan (MID-RASP) 2020-2022 Edition considers and supports the objectives and priorities of GASP 2020-2022 Edition. MID-RASP also emphasizes the importance of identifying and mitigating risks at MID Region level. In addition, MID-RASP is to create a common focus on Regional aviation safety issues as a continuation of the MID Region work to improve aviation safety and to comply with ICAO standards and supports MID States and industry in implementing the GASP 2020-2022 Edition.

The Eighth meeting of the Regional Aviation Safety Group – Middle East (RASG-MID/8) was held in Cairo, Egypt, Virtual Meetings, 15-22 February 2021; endorsed the MID-RASP 2020-2022 Edition including the SEIs list and their respective actions through RASG-MID CONCLUSION 8/3. In addition, the RASG-MID/9 noted with appreciation the updated SEIs and their respective safety actions as well as the status of their implementation.

Therefore, to address organizational challenges/issues, Regional operational risks, and emerging risks, 17 SEIs and 51 safety actions have been included in the MID-RASP. The list reflecting the status and progress made for each SEI and its respective action(s) is at **Appendix B.**

Appendix A: CICTT Occurrence Categories

Code	Description
ADRM	Aerodrome
AMAN	Abrupt Maneuver
ARC	Abnormal runway contact
BIRD	Bird
CABIN	Cabin safety events
CFIT	Controlled flight into/towards terrain
CTOL	Collision with obstacles during take-off and landing
EVAC	Evacuation
F-NI	Fire/smoke (non-impact)
F-POST	Fire/smoke (post-impact)
GCOL	Ground collision
ICE	Icing
LOC-I	Loss of control in-flight
LOC-G	Loss of control-ground
OTHR	Other
RAMP	Ground handling
RE	Runway excursion
SCF-NP	System/component failure (non-power plant)
SCF-PP	System/component failure (power plant)
TURB	Turbulence encounter
UNK	Unknown or undetermined
USOS	Undershoot/overshoot
WILD	Wildlife
WSTRW	Wind shear or thunderstorm

Appendix B: Safety Actions- Consolidated List of SEIs with their respective Actions

SEI Code	SEI name	Actions	Owner(s)	Status/Progress	Completion date
Organizational Challenges and Emerging Risks					
Goal 2: Strengthen States' Safety Oversight Capabilities					
G2-SEI-01:	Strengthening of States' Safety Oversight Capabilities	**A1**- Conduct Capacity Building Activities (Workshops, Training, Webinars, GSI Courses) to promote effective implementation of SARPs, with a focus on the following technical areas: ANS, AGA, and OPS	ICAO	USOAP-CMA webinar conducted on 11 Feb 2021	2022
		A2- Conduct technical assistance and NCLB missions to States	ICAO		2022
		A3- Develop and implement a specific NCLB plan of actions	ICAO and concerned States		2022
G2-SEI-02:	Improve Regional Cooperation for the Provision of Accident & Incident Investigation	**A1**- Development and signature of the MOU among MENA ARCM States	ICAO, ACAO, and States (TBD)	. The AIIG/1 virtual meeting reviewed the MENA ARCM MoU draft and proposed to be presented to the 5th DGCA-MID for endorsement. The ARCM MoU endorsed by the 5th DGCA-MID virtual meeting and has been circulated to the States for signature.	2022
		A2- Conduct AIG Capacity Building Activities	ICAO and ACAO	Aircraft Accident and Incident investigation workshop to be held	2022

				in Morocco 28 Feb-1 March 2022. Joint event ACAO/ICAO.	
G2-SEI-03:	Sharing of Safety Recommendations related to Accidents and Serious Incidents	**A1**- Development of questionnaire to be circulated to MENA States on sharing safety recommendations on dedicated platform	ICAO, ACAO, and States (KSA & UAE)	The AIIG/1 virtual meeting agreed to establish a repository for MENA ARCM Member States to allow sharing and analysis of their safety recommendations and accordingly, the meeting reviewed the draft questionnaire and agreed to its presentation to the RASG-MID/9 meeting for endorsement.	2021
G2-SEI-04:	Enhance State Oversight on Dangerous Goods	**A1**- Dangerous Goods (DG)workshop for States 'inspectors	ICAO and ACAO. Supported by FAA	1. Joint ACAO/ICAO Dangerous Good Webinar has been held on 8 Nov 2021. 2. Joint event ACAO/ICAO Dangerous Goods Workshop back to back with Ground handling workshop planned to be held in Casa Blanca during 13-16 Nov 2022.	2022
		A2- Develop guidance material/share best practices to support States' inspectors for the conduct of the oversight for DG	States (Bahrain, Sudan, and Oman)	. To develop a guidance and be presented to SEIG/4 for review.	2022
		A3- Develop guidance material and providing webinar high energy devices	IATA	IATA will provide the tentative dates on Jan 2022 or Q1 2022	2022
		A4: Organize DG capacity building training	ICAO		2022

G2-SEI-05:	Human factors and Competence of Personnel	**A1**- Advisory Circular: Crew Resource Management Training Programme (CRM). **(Action addressed under G1-SEI-04:CFIT)**	IATA	IATA will provide the tentative dates on Jan 2022 or Q1 2022	2022
		A2- Organize Crew Resource Management Training workshop to share experience and best practices on CRM practical implementation	ICAO and ACAO. Supported by IATA and KSA. KSA: presentation/case study to be delivered by a subject matter expert (HF Investigator). FAA to be confirmed	Crew Resource Management (CRM) Workshop back to back with Team Resource Management (TRM) workshop planned to be held 19-23 June 2022. Joint ACAO/ICAO event and to be supported by KSA, CANSO, FAA and IATA	2022
		A3- Conduct workshop/webinar on fatigue risk management and mental Health best practices	IATA and ACAO. Supported by CANSO, IFALPA, Jordan, and KSA.	1- IATA will provide the tentative dates on Jan 2022 or Q1 2022 2- An online workshop conducted on FRMS jointly by ACAO and CAAS/SAA from 20 to 24 Sep 2021.	2022
		A4- Organize Team Resource Management Training workshop to share experience and best practices on TRM practical implementation	ICAO, ACAO, IATA, CANSO, FAA, and States (TBD	Crew Resource Management (CRM) Workshop back to back with Team Resource Management (TRM) workshop planned to be held 19-23 June 2022. Joint ACAO/ICAO and supported by FAA and IATA	2022

G2-SEI-06:	Impact of security on safety	**A1**- Circulate ICAO Doc 10084 Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones	ICAO	SL issued by ICAO July 2021. Completed	2021
		A2- Organize seminar/Symposium to exchange experiences and good practices on assessing the risks and sharing of information related to the overflying of conflict zones in coordination with RASFG-MID and MIDANPIRG	ICAO and ACAO. Supported by IATA, CANSO, States (TBD)	Coordination on-going and planned to be included in ICAO MID Office tentative schedule 2022	2022
		A3- Encourage States to issue NOTAMs to share threats information emanated from conflict zones within their airspaces	ICAO	Maintained as planned and will be issued Dec 2021.	2021
		A4- AIM forum NOTAM standardized template.	ICAO and IATA		2022
Goal 3: Ensure the Appropriate Infrastructure is available to Support Safe Operations					
G3-SEI-01:	Certification of International Aerodromes	**A1**- Support States on the implementation of the ICAO Annex 14 requirements to achieve compliance with regards to Aerodrome Design and Operations, through Workshops/Training	ICAO and ACI. Supported by ACAO	1. Training course conducted on implementing Annex 14, during period of 8-12 Nov2020 2. Online Workshop on airport certification conducted by ACAO during the period 25-28 Oct 2021	2022
		A2- Enhance capacity building for States CAAs and Airport operators related to aerodromes certification through Workshops/Training	ICAO and ACI	Conducted training on aerodrome certification 15-19 Nov 2021	2022
		A3- Develop guidance material/ share best practices on Apron Management	States (UAE and Egypt)	Reviewed by ASPIG and be presented for endorsement by the RASG-MID/9	2022
		A4 – Deployment of iPack on Aerodrome Re-Start	ICAO	iPack for Aerodrome Restart deployment is on-going for Syria.	2022

G3-SEI-02:	Establish Runway Safety Team (RST) at International Aerodromes	**A1-** Conduct of assistance missions by the Runway Safety Go-Team (RST)	ICAO. Supported RSP (Runway Safety Programme Partners)	Coordination on going	2022
		A2: Support States to implement the Global Reporting Format Methodology through workshops/trainings**: (Action addressed under G1-SEI-02: Runway Excursion)**	ICAO and ACI. Supported by CANSO, IATA, FAA and Aircraft Manufactures	1.Webinar has been conducted on 27 Oct 20 2.ACI webinar on Implementing GRF at airports with non-winter conditions; dated 27 May 2021 3. Five customized training on GRF implementation conducted.	2022
Goal 4: Expand the Use of Industry Programmes					
G4-SEI-01:	Promote the Use of industry Programmes	**A1-** Encourage IATA's IOSA and ISAGO registrations through safety promotion	IATA	6 States signed the MoU 2 potential States to be added to the list 2022	2022
		A2- Encourage the implementation of ACI Airport Excellence (APEX) in Safety Programme	ICAO and ACI	Coordination on Going with ACI	2022
Goal 5: Implementation of Effective SSPs and SMSs					
G5-SEI-01:	Implement an effective Safety Management	**A1-** Conduct ICAO SSP training course in Cairo	ICAO	SSP course planned for 6-11 March 2022	2022
		A2- Conduct SSP Workshop in coordination with ACAO in Casablanca, Morocco	ICAO and ACAO	1. ACAO/ICAO SSP Implementation Workshop planned 23-27 May 2022. 2. An Event Risk Assessment webinar was delivered on 7 June 2021organised by ICAO MID Office	2022

		A3- Provide SSP/SMS workshops for MID States personnel	ICAO. Supported by IATA, CANSO, ACI, and States (UAE)	1.SSP workshop conducted in Kuwait in March 20. 2.SMS implementation training online course jointly with Singapore CAAS 7-11 Feb 2022	2022
		A4- Develop guidance material/share best practices on occurrence reporting for the CAA personnel on establishing an effective operation of the mandatory and voluntary reporting systems	States (UAE)	Draft to be completed by Q 1 2022 and be presented to SEIG/4 for review	2022
		A5- Support and guide States in the development of NASPs through workshops and sharing of best practices	ICAO and States (UAE)	1. ICAO organized series of RASP webinars. - MID-RASP Webinar conducted by ICAO on 25 May 2021 2. ICAO organized series of Webinars related to GASP/NASP: - 16 March 2021: ICAO's Global Safety Strategy: the Global Aviation Safety Plan. - 30 March 2021: Introduction to the National Aviation Safety Plan - 13 April 2021: Using the Roadmap to Develop a National Aviation Safety Plan	2022
		A6- Development of guidance/share best practices for the processes and procedures for oversight of SMS	States (UAE)	Guidance material structure has been drafted and an update to be presented to the SEIG/3 meeting Draft to be completed by Q1 2022 and presented to SEIG/4 for review	2022
		A7- Deployment of the Aviation Safety Risk Management iPack	ICAO	Completion of ASRM iPACK related to COVID-19 project with PACA Oman and conducted the closing meeting on 4 May 2021.	2020

				Completed.	
		A-8- Conduct assistance missions by SMIT to support States with SSP implementation	SMIT.	SMIT Handbook Draft is reviewed by the SEIG/3 and will be presented to RASG-MID/9 for endorsement.	2022
Goal 6: Increase Collaboration at the Regional Level to Enhance Safety					
	To be developed in the future				
Regional Operational Safety Risks					
Goal 1: Achieve a continuous reduction in Operational Risks					
G1-SEI-01:	Aircraft upset in flight (LOC-I)	**A1-** Guidance material on flight crew proficiency	IATA and Aircraft manufacturers	IATA will provide the tentative dates on Jan 2022 or Q1 2022	2022
		A2- Advisory Circular: Mode Awareness and Energy State Management Aspects of Flight Deck Automation	IATA and Aircraft manufacturers. Supported by KSA	IATA will provide the tentative dates on Jan 2022 or Q1 2022	2022
		A3- Conduct Upset Recovery Workshop	ACAO, IATA, and ICAO. Supported by FAA	ICAO, KSA, and FAA UPRT conducted in Feb 2020	2022
		A4- Develop guidance material/share best practices on Ground Handling Service Provider Certification Process	IATA and KSA	The 1st guidance material draft to be submitted for ASPIG meeting for review and endorsement by RASG-MID/10	2022
		A5- Conduct a Ground Handling workshop	ACAO and ICAO. Supported by IATA	Ground handling Workshop back to back with Dangerous Goods workshop planned to be held in Casablanca during 14-16 Nov 2022. Joint event ACAO/ICAO	2022
G1-SEI-02:	Runway Safety- Runway Excursion	**A1-** Support States to implement the Global Reporting Format (GRF) Methodology through Webinar/ Workshops/Training	ICAO and ACI. Supported by CANSO, IATA, FAA and Aircraft Manufactures	**05** virtual GRF Training classrooms conducted for the MID Region States/Airport Operators	2021

		A2- Guidance material on un-Stabilized Approach	IATA. Supported by CANSO and IFALPA	GM on UA shared by IATA and it will be shared with States	2022
		A3- MID Region Action Plan/Milestones on the Global Reporting Format (GRF) Implementation	ICAO	Completed and submitted for the States	2021
		A4: MID Region customized ACI-ICAO Global Reporting Format (GRF) for Runway Surface Conditions for Airport Operators	ACI, ICAO	**05** virtual GRF Training classrooms conducted for the MID Region States/Airport Operators	2021
		A5- Develop guidance material/share best practices on GRF Deployment	UAE supported by IRAN, OMAN, SAUDI ARABIA	to be submitted to the ASPIG/4 for its validation.	2022
G1-SEI-03:	Runway Safety- Runway Incursion	**A1**- Support States to implement aerodrome inspection through workshops/trainings/Webinars	ICAO. Supported by FAA and UAE	Coordination on going with FAA and UAE	2022
G1-SEI-4:	Controlled Flight into Terrain (CFIT)	**A1**- Advisory Circular: Guidance for Operators to Ensure Effectiveness of GPWS Equipment	IATA and Aircraft manufacturers	IATA will provide the tentative dates on Jan 2022 or Q1 2022	2022
		A2- Advisory Circular: Instrument Approach Procedures Using Continuous Descent Final Approach Techniques	IATA and Aircraft manufacturers	IATA will provide the tentative dates on Jan 2022 or Q1 2022	2022
		A3- Circulate ICAO Guidance Doc 10000 on Flight Data Analysis Programme (FDAP) to support States providing oversight to air operators	ICAO	SL on ICAO Guidance Doc 10000 circulated by ICAO during July 2021. Completed	2022
		A4- Advisory Circular: Crew Resource Management Training Programme (CRM)	IATA, Aircraft manufacturers	IATA will provide the tentative dates on Jan 2022 or Q1 2022	2022

G1-SEI-05A1:	Loss of separation between civil and military aircraft"	**A1-** States and Regional organizations to share occurrences and/or safety analysis/information related to Near Mid Air Collisions (NMACs) including to the "Loss of separation between civil and military aircraft" and ATM-SG to perform a technical analysis of the reported occurrences and and/or safety analysis/information and then come out with recommendations. The technical analysis of the reported occurrences and recommendations be shared with ASRG.	ICAO. Supported by IATA, CANSO, and States	NMACs analysis to be provided by IATA to the ATM-SG for technical review and then the ATM-SG to provide recommendations for the next course of actions.	2022
		A2: Guidance/raising awareness/ coordination related to the civil and military cooperation in particular over high seas	ACAO and ICAO. Supported by States	CMC webinar is planned to be held 14-16 June 2022	2022
G1-SEI-05A2:	Interference to GNSS Signals	**A1**: GNSS/GPS interferences	ICAO and IATA	1.RSAdeveloped and circulated in 2020 2.Identify impacted area, identify source of the interference signals, develop RSA including risk management recommendations for preventive and reactive measures and reporting procedures.	2022

G1-SEI-05B:	Ensure the Safe Operations of UAS (drones)	**A1**- Circulate ICAO developed guidance and advisory circulars: Regulatory framework for the operation of drones to support states' CAA personnel in the implementation and oversight of UAS operations	ICAO	SL issued on the subject by ICAO MID office July 2021. Completed.	2021
		A2- Organize symposium on Drones related subjects	ICAO, ACAO. Supported FAA	- An ACAO-DfT-TSA Joint Virtual Workshop on Drones has been conducted the 9 & 10 Nov 21 with the attendance of more than 100 participants from 14 Arab States, 5Regional organizations and industry stakeholders. - Symposium Planned to be held in Morocco during 5-7 Dec 2022	2022
		A3- States and Regional organizations to share occurrences and/or safety analysis/information involving drones to ASRG to perform a technical analysis of the reported occurrences and come out with recommendations.	ICAO, IATA, ACI, CANSO, and States (TBD)	IATA to provide safety information and safety analysis if available.	2022

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CREDITS

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

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APPENDIX B

LIST OF OCCURRENCE CATEGORIES TAXONOMY

Scope: State of Occurrence

The data to be collected be based on scheduled commercial operations involving aircraft having a Maximum Take-off Weight (MTOW) above 5700 kg.

Occurrence Category	ADREP/CICTT taxonomy	Remarks
Runway Excursion (RE)	Veer off or overrun off the runway surface.	
Abnormal Runway Contact (ARC)	Any landing or take-off involving abnormal runway or landing surface contact.	
Loss of Control-Inflight (LOC-I)	Loss of Control while, or deviation from intended flight path, in flight.	
Controlled Flight Into Terrain (CFIT)	Inflight collision or near collision with terrain, water, or obstacles without indication of loss of control.	
MID Air Collision (MAC)/ NMACs	Airprox/TCAS Alerts, Loss of separation as well as NMAC or collisions between aircraft inflight.	
Fire/Smoke (F-NI)	Fire or smoke in or on the aircraft, in flight, or on the ground, which is not the result of impact.	
Runway Incursion (RI)	Any occurrence at aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for landing and takeoff of aircraft.	
System Component Failure –Non-Power Plant (SCF-NP)	Failure or malfunction of an aircraft system or component other than the power plant.	
Turbulence Encounter (TURB)	In-flight turbulence encounter.	
Birdstrike (BIRD)	Occurrences involving collisions/near collisions with bird(s).	
Navigation Errors (NAV)	Occurrences involving the incorrect navigation of aircraft on the ground or in the air	

System Component Failure- Power Plant (SCF-PP)	Failure or malfunction of an aircraft system or components related to the power plant.	
Security related (SEC)	Criminal/Security acts which result in accidents or incidents (per Annex 13 to the Convention on International Civil Aviation).	
Wind shear	Flight into wind shear or thunderstorm	

NB: States may share any other occurrence category or national safety concern.

APPENDIX C

TEMPLATE FOR THE COLLECTION OF

ACCIDENT, SERIOUS INCIDENT AND INCIDENT DATA AND SAFETY ANALYSIS

Name of State: ……..

1- Occurrences: *The data to be collected be based on scheduled commercial operations involving aircraft having a Maximum Take-off Weight (MTOW) above 5700 kg.*

#	Occurrence Category	2018			2019			2020			2021			2022		
		# Accidents	# Serious incidents	# Incidents	# Accidents	# Serious incidents	# Incidents	# Accidents	# Serious incidents	# Incidents	# Accidents	# Serious incidents	# Incidents	# Accidents	# Serious incidents	# Incidents
1	Runway Excursion (RE)															
2	Abnormal Runway Contact (ARC)															
3	Loss of Control-Inflight (LOC-I)															
4	Controlled Flight Into Terrain (CFIT)															
5	Mid Air collision (MAC)/ NMAC															
6	Fire/Smoke (F-NI)															
7	Runway Incursion- (RI)															
8	System Component Failure-Non-Power Plant (SCF-NP)															
9	Turbulence Encounter (TURB)															

10	BIRD															
11	Navigation Errors (NAV)															
12	System Component Failure-Power Plant (SCF-PP)															
13	Security related (SEC)															
14	Wind shear															

States should provide the number of accident, serious incidents, and incidents related to each category mentioned in the template above for the past five years (2018-2022)

Scope: State of Occurrence

2- Brief- Safety data Analysis (Root-cause analysis, Trends, Low probability high consequence (LPHC) events if any, etc.)

3- Identified Top Five safety risks

4- Safety mitigations/Recommendations

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