Annual Safety Report

2023

ASIA PACIFIC REGION

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Acknowledgement to contributors

RASG-APAC thanks the members of the RASG-APAC Annual Safety Reporting and Programme Working Group that contributed to the completion of this 2023 RASG-APAC Annual Safety Report:

- International Civil Aviation Organization (ICAO)
- International Air Transport Association (IATA)
- Commercial Aviation Safety Team (CAST)

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01 Foreword

Regional Aviation Safety Group – Asia Pacific (RASG-APAC) Background

The establishment of the Regional Aviation Safety Group – Asia Pacific (RASG-APAC) was endorsed at the 47th DGCA conference as a focal point to ensure harmonisation and coordination of efforts aimed at reducing aviation safety risks for the Asia Pacific region.

RASG-APAC supports implementation of the ICAO Global Aviation Safety Plan (GASP) and the Global Aviation Safety Roadmap (GASR).

RASG-APAC membership includes representatives from the 41 States/Administrations associated with the ICAO Asia Pacific regional office.

RASG-APAC has established the Asia Pacific Regional Aviation Safety Team (APRAST) to implement its work programme. The objectives of the APRAST include recommending enhancement initiatives to the RASG-APAC which will reduce aviation risks. To do so, APRAST will:

- review, for application within the Asia Pacific region, existing safety enhancement initiatives (SEIs) which have already been developed through the efforts of well-established, multinational safety initiatives.
- review, for application within the Asia Pacific region, the best practices and metrics defined in the GASP/GASR.
- review regional accidents, significant incident trends and other areas of local concern to determine unique issues that may warrant locally developed SEIs. The focus and priority for APRAST will be to introduce, support, and develop actions that have the potential to effectively and economically reduce regional aviation risks.

Supporting the work of the APRAST, are three Working Groups:

a. Safety Enhancement Initiative Working Group (SEI WG)
b. Safety Reporting Programme Working Group (SRP WG); and
c. Standing Working Group for the Asia Pacific Regional Aviation Safety Plan (AP-RASP)

Asia Pacific – Accident Investigation Working Group (APAC–AIG)

As the APAC-AIG is now placed directly under RASG, the APAC-AIG will review the Global Aviation Safety Plan/ Roadmap (GASP/R) GSI 3 /Focus Area 3, 'Impediments to Reporting of Errors and Incidents', and GSI 4/Focus Area 4, 'Ineffective Incident and Accident Investigation' and propose the necessary recommendations to address these two focus areas. The APAC-AIG will:

- review, for application within the Asia Pacific region, existing policies and procedures relating to accident investigation and the reporting of errors and incidents that have already been developed.
- review regional accidents and significant incident trends and other areas of local concern to determine unique issues that may warrant locally developed policies and procedures to effectively capture information for study and for the development of recommendations. The focus and priority for AIG WG will be to introduce, support, and develop actions that have the potential to effectively and economically reduce the regional aviation accident risk.

Safety Enhancement Initiative Working Group (SEI WG)

The role of the SEI WG is to assist APRAST in the development, implementation and review of SEIs to reduce aviation risks. These SEIs could be established based on the analysis of regional data, based on ICAO initiatives or the initiatives of other relevant organisations or regions or based on the risks and issues identified through the USOAP CMA process. The identified SEIs should be prioritised to ensure that those that have the greatest potential for reducing safety risk are examined first.

To accomplish the objectives, the SEI WG will:

i. Assist APRAST in the identification and development of SEIs, for application within the Asia and Pacific regions, which are aligned with the regional priorities and targets. The focus of these SEIs is to effectively and economically mitigate regional safety risks identified by the SRP-WG
ii. Assist APRAST in the provision of generic implementation guidance related to the SEIs to guide members through the SEI implementation process

iii. Assist APRAST in the identification of assistance programmes such as, but not limited to, workshops and seminars to improve the level of implementation of developed SEIs, with the support of the Secretariat.

iv. Develop and conduct a process to review existing SEIs and provide recommendations to improve the effectiveness and level of implementation.

Safety Reporting Programme Working Group (SRP WG)

The SRP WG's role is to gather safety information from various sources to determine the main aviation safety risks in the Asia Pacific region. To be included in the Annual Safety Report are:

i. Reactive information

ii. Proactive information

The Information Analysis Team (IAT) formed within the SRP WG will analyse the available safety information to identify risk areas. Recommendations for safety enhancement initiatives will be made by the SRP WG to the RASG-APAC, through APRAST, based on the identified risk areas.

An Ad-hoc Working Group was formed to formulate the Regional Aviation Safety Plan (RASP) as the States will be adopting the GASP 2020–22 to align themselves in developing a National Aviation Safety Plan (NASP) taking reference from the GASP and the region's Regional Aviation Safety Plan (RASP), which was approved by RASG-APAC/9, in November 2019.

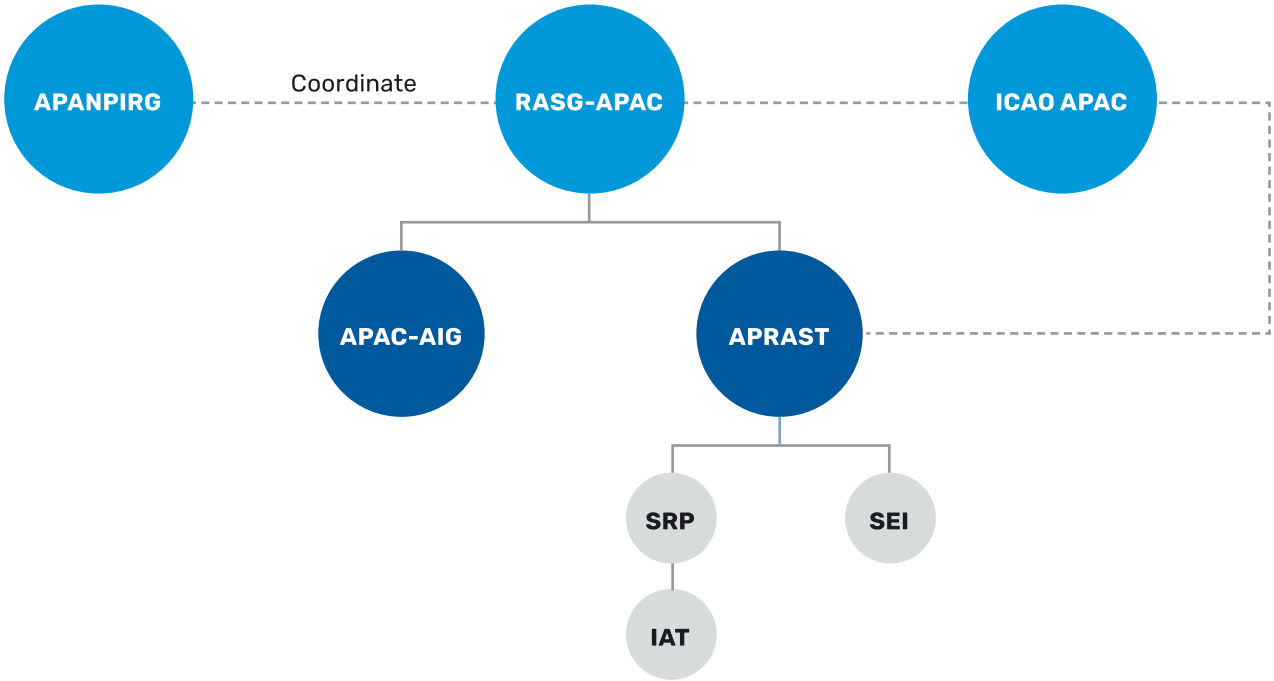
The organisational structure of the RASG-APAC and its subsidiary bodies is shown in Figure 1.1. The International Civil Aviation Organization (ICAO) Asia Pacific regional office in Bangkok provides the secretariat support necessary for the RASG-APAC to function.

The 2023 Annual Safety Report, developed by the SRP WG and published by RASG-APAC, is the 10th edition of exclusive safety report for the Asia Pacific region based on data provided by ICAO, the US Commercial Aviation Safety Team (CAST) and the International Air Transport Association (IATA). Analysis of this aviation safety data was completed with the in-kind contributions of aviation safety personnel from RASG-APAC member States/ Administrations and industry partners. This report is envisioned to be an annual publication providing appropriately updated aviation safety information.

Copies of this report can be downloaded from: **https://www.icao.int/APAC/RASG/Pages/APAC-Safety-Report.aspx**

For clarification or additional information please email: **apac@icao.int**

Figure 1.1 RASG-APAC Organisation



'Asia-Pacific Regional Aviation Safety Plan Working Group (AP-RASP WG)' was formed by electing the AP-RASP Co-Chair (State) and AP-RASP Co-Chair (Industry) under Asia-Pacific Regional Aviation Safety team (APRAST) during the APRAST/20 meeting dissolving the ad-hoc Working Group to review on the AP-RASP updates and implementation process.

02 Introduction

The objectives of this RASG-APAC Annual Safety Report are to gather safety information from various stakeholders, analyse the main aviation safety risks in the Asia Pacific region and identify possible actions for enhancing aviation safety in a coordinated manner.

The safety information presented in this report is based on the compilation and analysis of data provided by ICAO, IATA and CAST. Accident and fatal accident occurrence data was sourced from ICAO iSTARS from period 2010–2016. Data from 2017 onwards in this report were directly made available by ICAO to the SRP WG. Data used are reviewed and validated by the ICAO Occurrence Validation Study Group (OVSG) using definitions provided in Annex 13 — Aircraft Accident and Incident Investigation.

This RASG-APAC Annual Safety Report focuses on reactive information relating to hull loss and fatal accidents (both on the ground and in flight) involving commercial aeroplanes operated by (or registered with) the member States/Administrations of the RASG-APAC i.e. States/Administrations associated with the ICAO Asia Pacific Regional Office. It will also include proactive information for the Asia Pacific region based on the USOAP Continuous Monitoring Approach (CMA). The analysis in this report such as the most common and high risk accident categories are identified in accordance with the ADREP taxonomy developed by the **CAST/ICAO Common Taxonomy Team (CICTT)**.

Figure 2.1 Asia Pacific region – countries associated with the ICAO Asia Pacific Regional Office

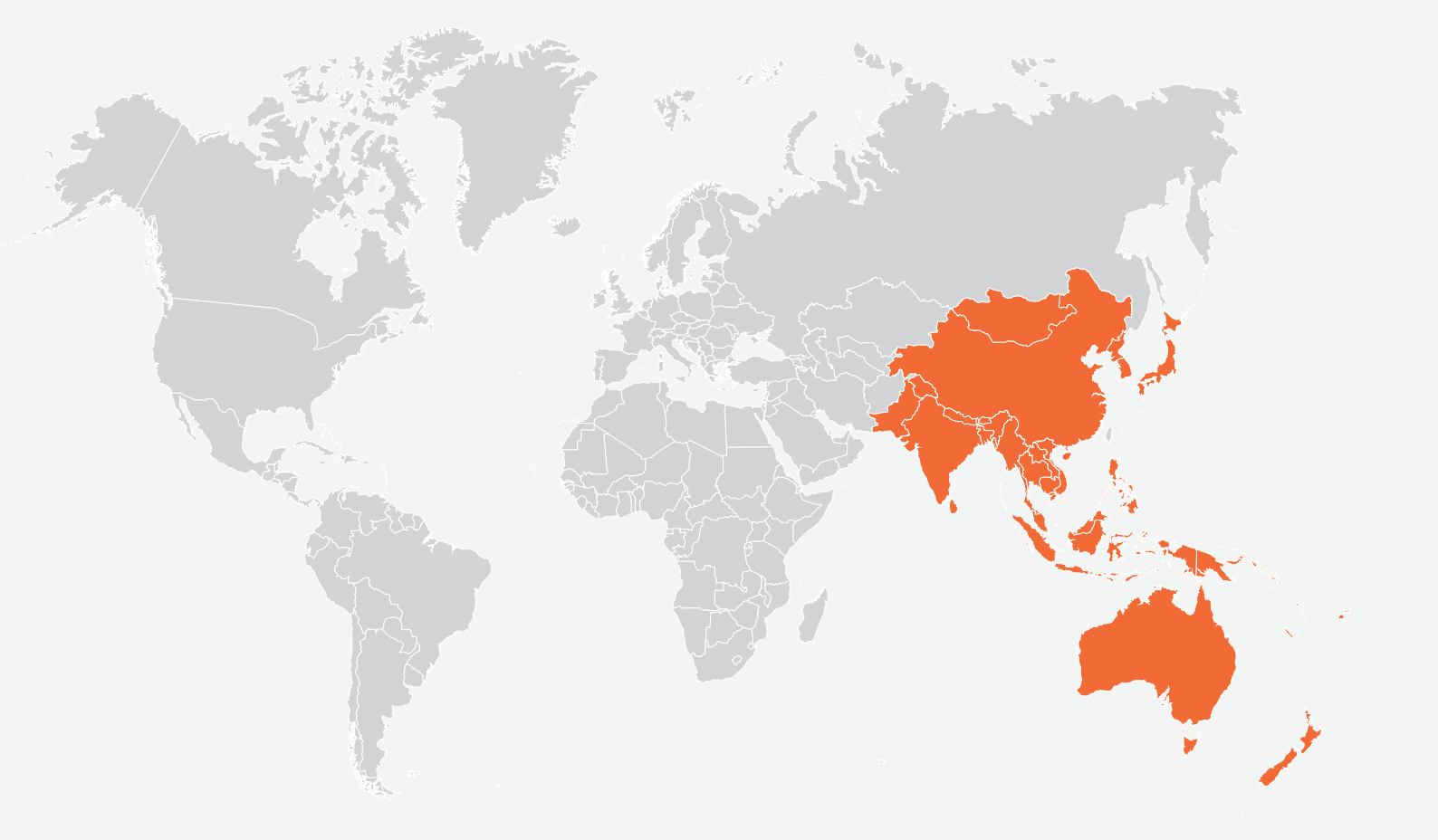


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Table 2.1 Member States/Administration accredited with the ICAO Asia Pacific Regional Office

Member States/Administration	
Afghanistan	Mongolia
Australia	Myanmar
Bangladesh	Nauru
Bhutan	Nepal
Brunei Darussalam	New Zealand
Cambodia	Pakistan
China	Palau
Hong Kong, China	Papua New Guinea
Macao, China	Philippines
Cook Islands	Republic of Korea
Democratic People's Republic of Korea	Samoa
Fiji	Singapore
India	Solomon Islands
Indonesia	Sri Lanka
Japan	Thailand
Kiribati	Timor Leste
Lao People's Democratic Republic	Tuvalu
Malaysia	Tonga
Maldives	Vanuatu
Marshall Islands	Vietnam
Micronesia (Federated States of)	

03 Executive summary

Reactive information analysis

The global accident rate saw a gradual rise after a continued period of decrease from 2019 to 2021. In 2022, the accident rate rose from 1.93 accidents per million departures in 2021 to 2.05 per million departures in 2022. Similarly, RASG-APAC accident rate also increased from 0.82 per million departures to 1.38 per million departures over the same period. The RASG-APAC's accident rate has remained lower than the global accident rate over the past decade. Overall, the five-year moving average accident rate, globally and for RASG-APAC, has shown a consistent downward trend.

The number of accidents attributable to States/ Administrations in the RASG-APAC region in 2022 rose from 7 in 2021 to 13 in 2022. In terms of fatalities, there were 2 fatal accidents in 2022, up from 1 in 2021. One of the two fatal accidents that occurred in APAC was attributed to turbulence while the other one is unknown. In 2022, turbulence accounted for more than half of the accidents in APAC (7), followed by runway excursion. From 2018 to 2022, the three most common accident categories in the APAC region were: (i) Turbulence (ii) Runway Excursion and (iii) Abnormal Runway Contact.

According to IATA, the top contributing categories, which is defined as the categories with contributing factors with the highest scores, are (i) Flight Crew Errors (ii) Latent conditions and (iii) Countermeasures.

With both the global and APAC accident results, consideration must be given for the reduced activity levels resulting from the COVID–19 pandemic.

Proactive information analysis

The RASG-APAC region had an overall USOAP Effective Implementation (EI) score of 63.62 per cent in 2023, lower than its performance of 66.35 per cent in 2022. This result remains lower than the global level of 69.32 per cent.

In terms of Critical Elements (CE), the APAC region had lower EI scores for all categories as compared to the global average. By CE, CE–4 on *Technical personnel qualifications and training* and CE–8 on *Resolution of safety concerns* had the lowest EI scores within RASG-APAC, at 53.52 and 48.80 per cent respectively. By area, Accident and Incident Investigation (AIG) and Aerodrome and Ground Aids (AGA) had the lowest EI scores of 50.09 per cent and 60.97 per cent respectively.

04 Safety information

Safety information is an important input for any safety management process. With adequate and accurate safety information, hazards can be identified through robust processing and critical analysis. Identified hazards and their associated risk can then be prioritised and appropriate mitigation actions taken.

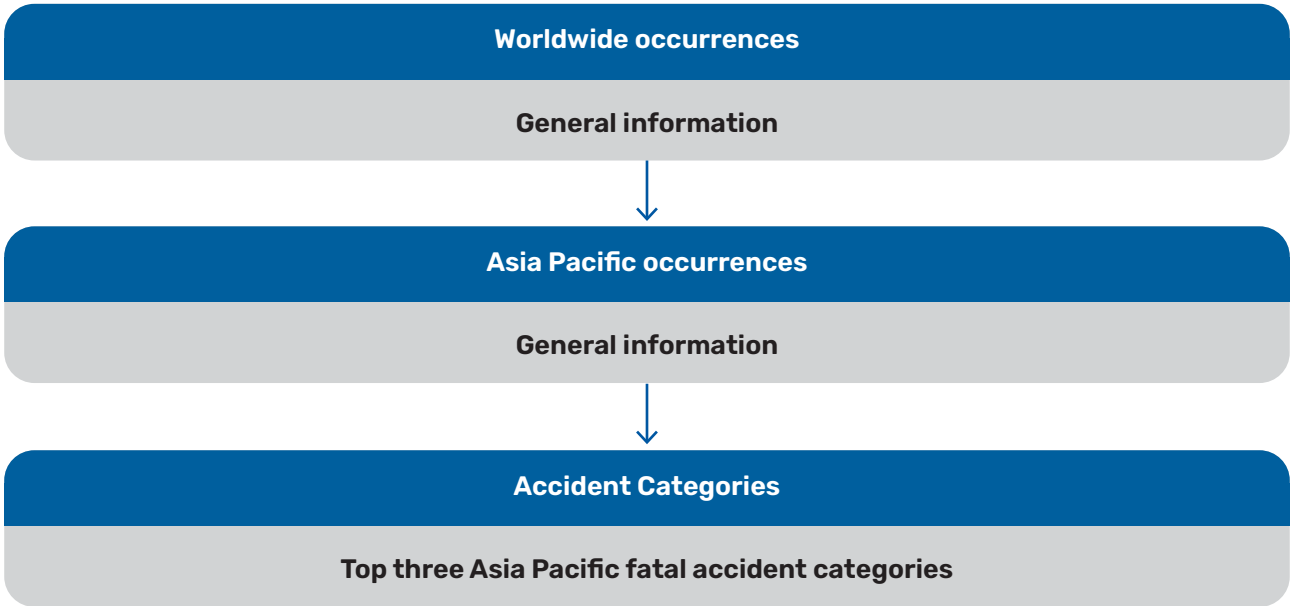
RASG-APAC can be viewed as a regional safety management process or a regional safety program (RSP) in the same way that a State Safety Program (SSP) is a national safety management process and a Safety Management System is a service provider's safety management program. Using safety information provided by ICAO, IATA and CAST helps the region to identify the areas of greater safety concerns and therefore be able to collectively focus on addressing these areas.

05 Approach for Analysis

Our approach for the analysis is to process the accident information, provided by ICAO, IATA and the US CAST, involving scheduled commercial operations for fixed-wing aircraft of MTOW greater than 5700kg operated by (or registered with) the members States/ Administrations of RASG-APAC.

The analysis initially focuses on accident rates, numbers and categories from a global versus APAC perspective, then on the sub-regions of North Asia, South Asia, South East Asia and the Pacific. The process is illustrated in Figure 5.1.

Figure 5.1 Approach for analysis



The grouping of States/Administrations into the four APAC sub-regions will firstly be based on their membership with the respective Cooperative Development of Operational Safety and Continuing Airworthiness Programme (COSCAP) or, if there is no affiliated membership with any sub- regional body, on geographical association.

The results of the analysis for each of the sub-regions can therefore be used by the various COSCAP or sub-regional groupings to identify work programmes. Moreover, each of the COSCAPs will be able to provide assistance in implementation and training in areas that are more relevant to their sub-regions.

The grouping of the States/Administrations in the four RASG-APAC sub-regions is as follows:

North Asia (NA) region

States/Administrations that are members of COSCAP-NA:

- China (including Chinese Taipei)
- Hong Kong, China
- Macao, China
- Democratic People's Republic of Korea
- Japan
- Mongolia
- Republic of Korea

South Asia (SA) region

States/Administrations that are members of COSCAP-SA:

- Afghanistan
- Bangladesh
- Bhutan
- India
- Maldives
- Nepal
- Pakistan
- Sri Lanka

South East Asia (SEA) region

States/Administrations that are members of COSCAP-SEA:

- Brunei Darussalam
- Cambodia
- Indonesia
- Lao People's Democratic Republic
- Malaysia
- Myanmar
- Philippines
- Singapore
- Thailand
- Timor Leste
- Vietnam

Pacific region

States/Administrations that are members of the Pacific Aviation Safety Office (PASO):

- Australia (Including Norfolk Island and Christmas Island)
- Cook Islands
- Fiji
- Kiribati
- Marshall Islands
- Micronesia (Federated States of)
- Nauru
- New Zealand
- Palau
- Papua New Guinea
- Samoa
- Solomon Islands
- Tonga
- Tuvalu
- Vanuatu

06 Reactive Safety Information

Background

As defined in the fourth edition (2.5.2) of the ICAO Document 9859, a reactive analysis method responds to events (such as incidents and accidents) that have already happened and about which information has been collected. In the context of this report, all the reactive safety information analysed relates to accidents involving aircraft operated by (or registered with) the member States/Administration within the RASG-APAC region.

Data Sources

The reactive safety information analysed in this report has been obtained from ICAO, IATA and CAST, and the organisation of this information will take these sources into account. It is important to note that the definition of an accident differs between ICAO and IATA and this should be considered when comparing trends from these data providers.

Please note:

1. ICAO's reactive safety information is derived from ADREP reports, validated by the OVSG. The OVSG reviews and validates aviation safety occurrence information supplied by member States' investigative bodies. The definition of 'accident' is based on ICAO Annex 13.
2. IATA's reactive safety information relates to accidents that result in hull loss, fatalities and substantial damage to aircraft. It contains statistics on accidents classified by the Accident Classification Technical Group and uses the same definitions for the IATA Annual Safety Report. All regional accident rates are based on the operator's State of registry and rates are always based on per million sectors (flights).

- 'All Accident Rate' contains all accidents (hull loss and substantial damage) for the type of analysis being performed. For example, 'all accident rate' in the general context means all accidents, of all aircraft types that meet the ACTG criteria (commercial operation, jet or turboprop and MTOW > 5,700Kg) and of all accident categories; 'all accident rate' in the context of jet/Hard Landing means all jet accidents (hull loss and substantial damage) that had a hard landing.
- Only accidents of the following categories are part of the database:
  - Controlled Flight-Into-Terrain (CFIT)
  - Loss of Control In-flight
  - Runway Collision
  - Mid-air Collision
  - Runway / Taxiway Excursion
  - In-flight Damage
  - Ground Damage
  - Undershoot
  - Hard Landing
  - Gear-up Landing / Gear Collapse
  - Tailstrike
  - Off Airport Landing / Ditching
  - Other End State
- IATA defines 'sector' as the operation of an aircraft between take-off at one location and landing at another location (other than a diversion)
- IATA's North Asia (NASIA) and Asia Pacific (ASPAC) regions are equivalent to ICAO's APAC region.

World and Asia Pacific Safety Trends

6.1 World and APAC Accident Rates

The accident rate in the APAC region has declined significantly over the last decade from 2.40 (2013) to 1.38 (2022) per million departures. This compares favourably with the global accident rates where the rate of decline has been less over the same period, from 2.84 (2013) to 2.05 (2022) accidents per million departures.

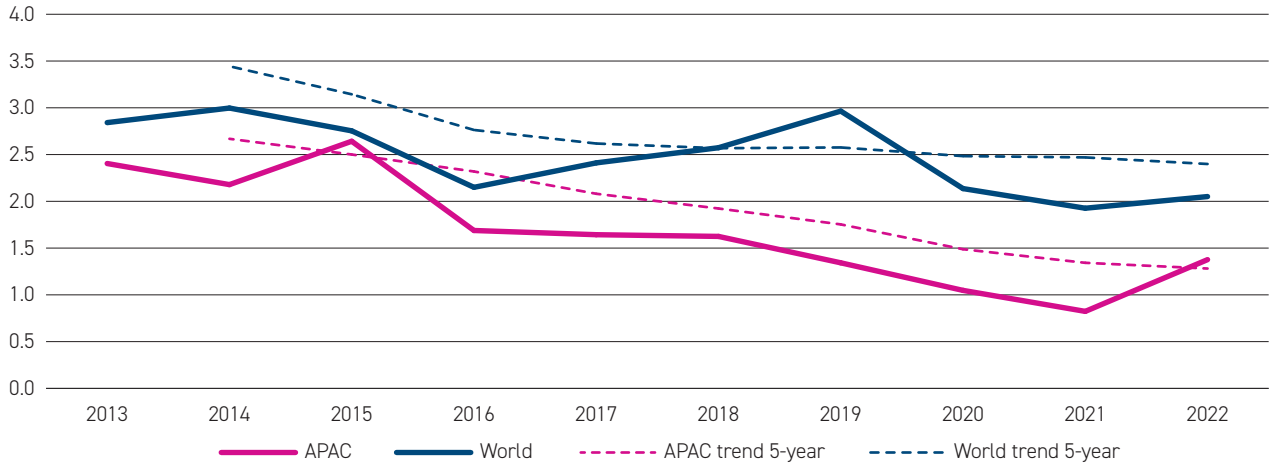
The APAC region 5-year moving average accident rate shows a positive downward trend since 2014. Reducing from 2.67 to 1.34 accidents per million departures

Comparing the APAC accident rates between 2021 and 2022, indicate that the accident rate rose from 0.82 to 1.38 per million departures.

The increase in accident rate within APAC can be attributed to the higher number of accidents in 2022 (13) as compared to 2021 (7). Globally, there were 64 accidents in 2022, up from 48 in 2021.

Accident rates according to the IATA dataset are shown in Charts 6.1.2. The accident rate according to IATA in 2022 is 0.52 and 1.21 accidents per million departures for APAC and the World respectively. In 2022, there was a decrease in accident rates for APAC and slight increase in global accident rates. Looking at the long-term changes in accident rates, the data shows that there is a decreasing trend in accident rates since 2013.

Chart 6.1.1 ICAO: World vs RASG-APAC Accident Rate (2013–2022)



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Although there is a degree of consistency between ICAO and IATA data, there are some variations in trends exhibited. This may in part be due to the different accident definition used i.e. hull loss, fatalities and substantial damage, relative to the definition used by ICAO iSTARS which extends to accidents involving serious injuries and accidents where aircraft damage may not have resulted in hull loss.

Chart 6.1.3 shows the fatal accident rate from 2013–2022 in both the APAC region and the world. Globally, the number of fatal accidents increased from 4 in 2021 to 7 in 2022. In the APAC region, two fatal accidents were recorded in the APAC region, up from one in 2021. Overall, the accident rate for APAC region in 2022 is trending upwards, and is above the 5-year average, at 0.21 and 0.16 accidents per million departures respectively. The 5-year trend for fatal accident rate in APAC remains stable and below the global 5-year trend.

Chart 6.1.2 IATA: APAC region's Accident Rate (2013–2022)

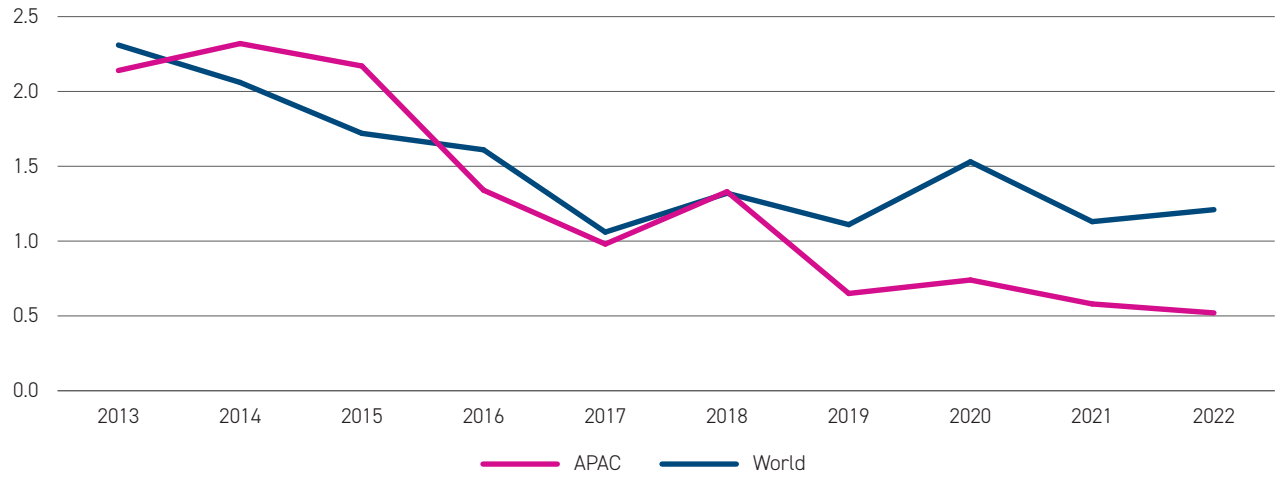
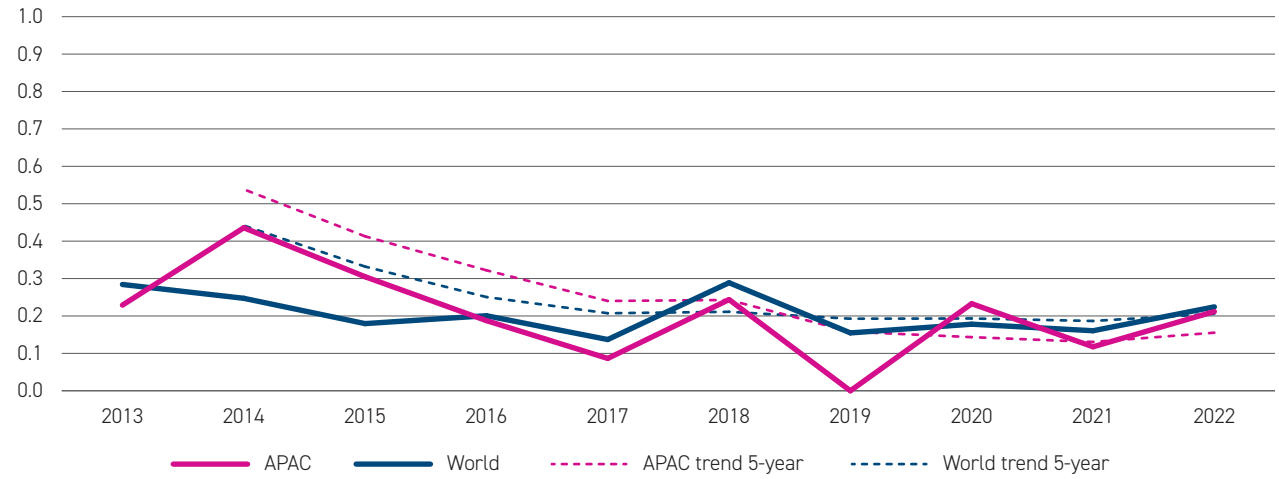


Chart 6.1.3 ICAO: World vs. RASG-APAC Fatal accident rate (2013–2022)



6.2 World and APAC Accident Numbers

In 2022, the APAC region recorded a total of 13 accidents, 2 of which were fatal. This represented an increase from the total of 7 and 9 accidents in 2021 and 2020 respectively. A summary of the accident numbers over the past 10 years is shown in Chart 6.2.1.

Comparing the long term-trend in accident numbers, a general downward trend can be observed for the APAC region over the years. Prior to 2022, the average number of accidents and fatal accidents in the previous five years was 14.4 and 1.4, respectively.

Chart 6.2.1 ICAO iSTARS and OVSG: Number of accidents – RASG-APAC (2013–2022)

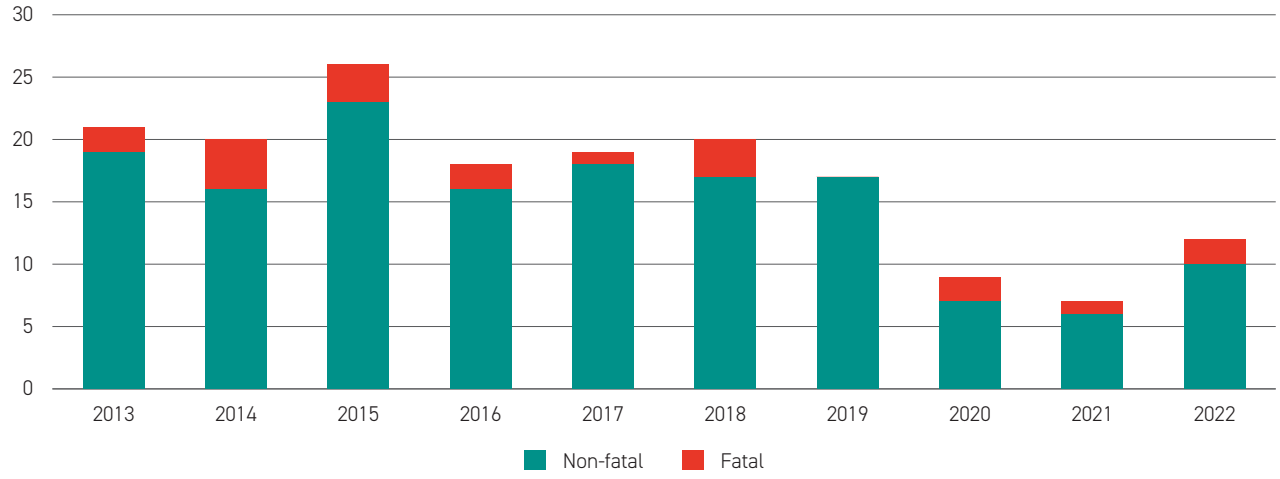


Table 6.2.1 IATA: Accident Count from 2018 to 2022 (Region of Occurrence vs Region of Operator)

	2018	2019	2020	2021	2022	Total
APAC Operators Accidents	18	9	6	5	5	**43**
Accidents occurring in APAC	15	9	7	5	6	**42**
APAC Operators Accidents in APAC	15	9	6	4	5	**39**
Non-APAC Operators Accidents in APAC	0	0	1	1	1	**3**

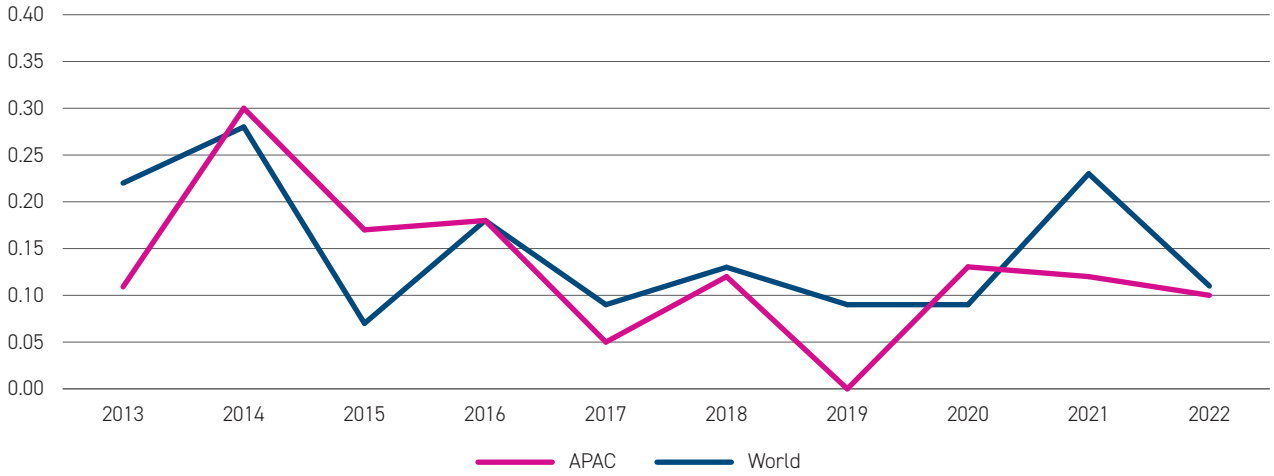
Table 6.2.1 provides an IATA breakdown of accident counts of APAC operators by Region of Occurrence (worldwide and in APAC region), and a breakdown by Region of Operator in APAC region (APAC and non-APAC operator).

Not surprisingly, most APAC operator accidents occur within the APAC region, while non-APAC operator accidents are very seldom in the APAC region. The number of accidents attributable to APAC operators remained the same from 2021 to 2022. The number of accidents in APAC region rose slightly from 4 in 2021 to 5 in 2022.

Accident Trends (Fatality Risk)

Chart 6.2.2 shows the fatality risk for both APAC and the world from 2013–2022. Two fatal accidents occurred in the APAC region in 2022, resulting in a fatal accident risk of 0.10 per million sectors, in comparison with the global rate at 0.11.

Chart 6.2.2 IATA: Fatality Risk (2013–2022)



6.3 World and APAC Accident Categories

Data from CAST, as shown in Chart 6.3.1, identified Controlled Flight into Terrain (CFIT), Loss of Control In-Flight (LOC-I) and Abnormal Runway Contact (ARC) as the leading causes for fatality risk for APAC operator domicile countries. In terms of number, Runway Excursion-Landing (RE-landing), CFIT and ARC are the leading causes for accidents.

CFIT, LOC-I and Runway/Taxiway Excursion have also been identified by IATA as the high-risk accident categories globally. Charts 6.3.2, 6.3.3 and 6.3.4 show the performance of each of these categories in the APAC region for the last ten years.

- There were no accidents attributable to CFIT in APAC and the world in 2022, continuing a trend over the past 5 years for APAC.
- The accident rate in APAC attributable to runway/taxiway excursion increased from 0 in 2021 to 0.20 accidents per million sectors in 2022. This is above the APAC 3-year moving average of 0.10 accidents per million sectors
- There were no accidents attributable to LOC-I in 2022 in APAC region.

Chart 6.3.1 Fatality and Accident Risks for High-Risk Accident Categories in APAC

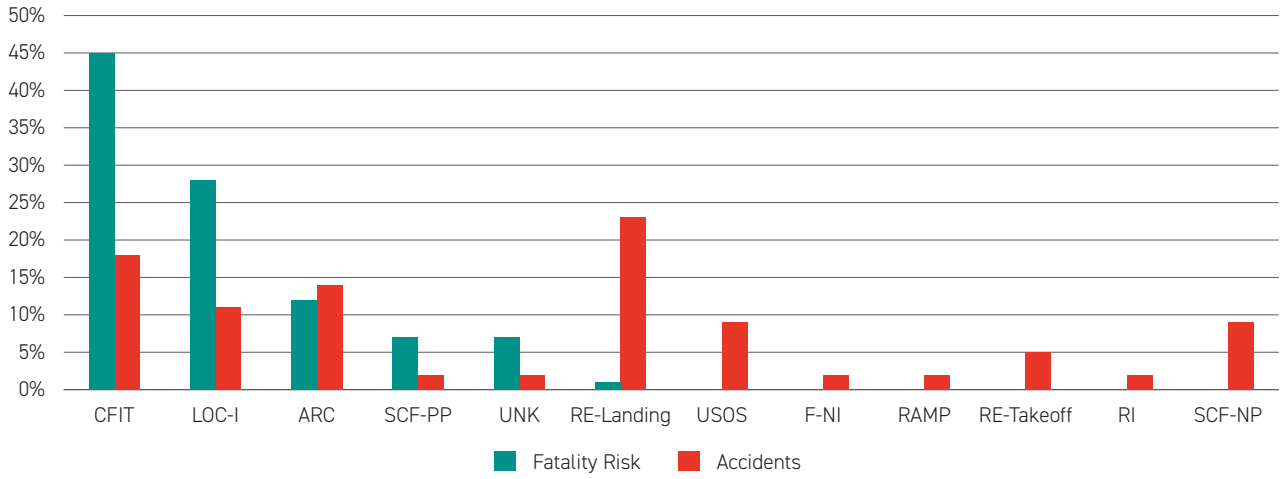


Chart 6.3.2 IATA: Annual Controlled Flight into Terrain (CFIT) accident rate (APAC vs. World) (note: the accident statistics are based on scheduled commercial air transport operations involving fixed-wing aircraft of MTOW > 5,700kg).

Chart 6.3.2 IATA: Annual CFIT accident rate (APAC vs World)

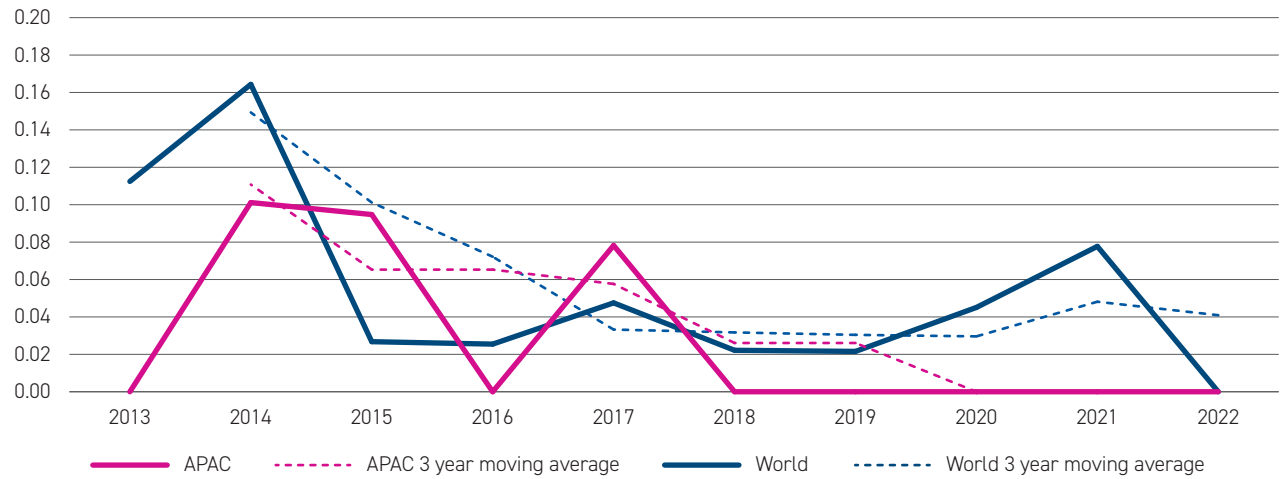


Chart 6.3.3 IATA: Annual Loss of Control In-flight accident rate (APAC vs World)

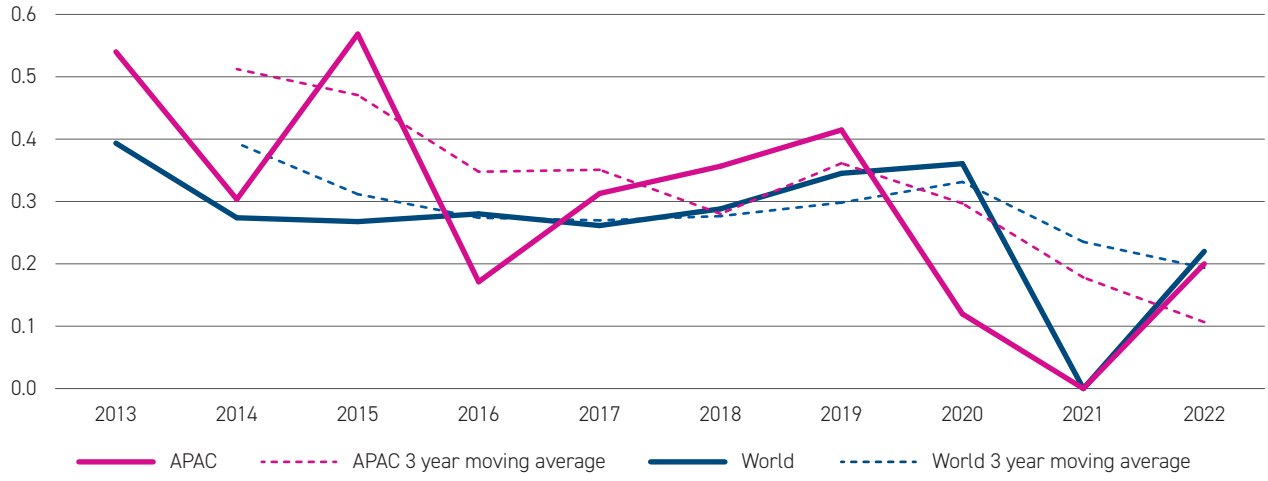


Chart 6.3.4 IATA: Annual runway/taxiway excursion accident rate (APAC vs World)

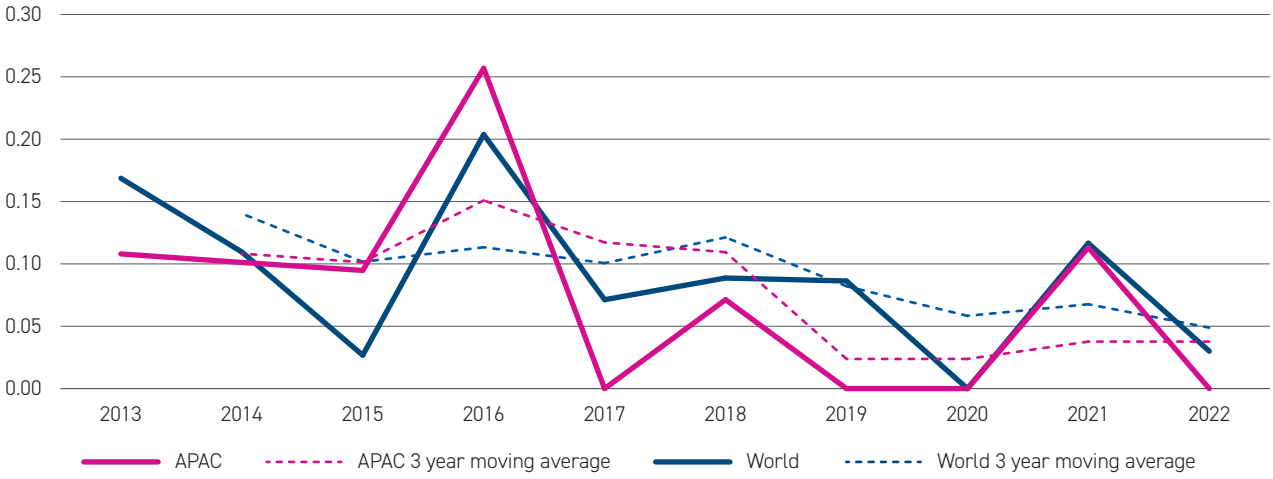


Table 6.3.1 APAC fatal accident categories (2018–2022) (Based on ICAO iSTARS and OVSG data)

Year	TURB	UNK	LOC-I	RE	ARC	USOS	Total
2018	0	0	1	1	0	1	**3**
2019	0	0	0	0	0	0	**0**
2020	0	0	0	1	1	0	**2**
2021	0	0	1	0	0	0	**1**
2022	1	1	0	0	0	0	2
Total	**1**	**1**	**2**	**2**	**1**	**1**	**8**

Table 6.3.2 APAC accident categories (2018–2022) (Based on ICAO iSTARS and OVSG data)

Year	TURB	F-NI	RE	WSTR	OTH	USOS	LOC-I	CFIT	ADRM	ARC	RAMP	NAV	CTOL	GCOL	AMAN	Total
2018	3	0	6	1	0	1	1	0	0	5	0	1	1	1	0	**20**
2019	6	1	3	0	0	0	0	0	0	4	1	0	0	1	1	**17**
2020	3	1	0	0	0	0	0	0	0	3	0	0	0	0	0	**7**
2021	2	0	0	0	0	0	1	0	0	3	0	0	0	0	1	**7**
2022	7	0	3	0	1	0	0	0	0	0	0	0	0	0	0	**13**
Total	**21**	**2**	**12**	**1**	**1**	**1**	**2**	**0**	**0**	**15**	**1**	**1**	**1**	**2**	**2**	**64**

Table 6.3.1 shows the breakdown of fatal accident categories in the APAC region from 2018 to 2022. Over the last five years, fatal accidents in APAC were most likely the result of (i) Loss of Control in Flight or (ii) Runway Excursion. In 2022, one of the two fatal accidents that occurred in APAC was attributed to turbulence while the other one is unknown.

Table 6.3.2 shows the breakdown of accident categories in the APAC region from 2018 to 2022. The three most common accident categories over the past five years were: (i) Turbulence (ii) Runway Excursion and (iii) Abnormal Runway Contact.

6.4 Top Contributing Factors to Accidents within Asia Pacific – IATA

According to IATA[1], the top Contributing Factors to Accidents within Asia Pacific from 2013–2022 are shown in Table 6.4.1. The top contributing categories, which is defined as the categories with contributing factors with the highest scores, are (i) Flight Crew Errors (ii) Latent conditions and (iii) Countermeasures

The specific elements related to these top contributing categories are outlined below:

1. Flight Crew Errors – Manual Handling / Flight Controls;
2. Latent conditions – Regulatory Oversight; and
3. Countermeasures – Overall crew performance

1 Data provided by IATA are classified and analysed by the IATA Accident Classification Task Force (ACTF). The ACTF comprises safety experts from airlines from different regions of the world, aircraft and equipment manufacturers, air navigation service providers, pilot unions and air navigation chart providers. Refer to IATA annual safety report for more details regarding the taxonomy.

Table 6.4.1 Top Contributing Factors to Accidents within Asia Pacific (2018–2022)

Contributing Factors	% of All Accidents (involving Hull Loss or Substantial Damage)	Contributing Factors	% of Accidents (involving Hull Loss or Substantial Damage) IOSA Certified Airlines Only
Latent Conditions			
Regulatory Oversight	48%	Regulatory Oversight	43%
Safety Management	38%	Safety Management	33%
Flight Operations	28%	Flight Operations	29%
Environmental Threats			
Meteorology	32%	Thunderstorms	28%
Airport Facilities	19%	Airport Facilities	19%
Aircraft Malfunction / SCF-NP	19%	Aircraft Malfunction / SCF-NP	19%
Flight Crew Errors			
Manual Handling / Flight Controls	47%	Manual Handling / Flight Controls	47%
SOP Adherence / SOP Cross-verification	40%	SOP Adherence / SOP Cross-verification	39%
Intentional	29%	Intentional	28%
Undesired Aircraft States			
Vertical / Lateral / Speed Deviation	29%	Vertical / Lateral / Speed Deviation	31%
Long/floated/bounced/firm/ off-centre/crabbed land	29%	Long/floated/bounced/firm/ off-centre/crabbed land	28%
Unstable Approach	25%	Unstable Approach	24%
Countermeasures			
Overall Crew Performance	33%	Overall Crew Performance	33%
Monitor / Cross-check	27%	Monitor / Cross-check	26%
Leadership	16%	Leadership	19%

Asia Pacific Sub-regional Safety Trends

6.5 Sub-regional Accident Rates, Numbers and Categories

Chart 6.5.1 ICAO iSTARS, SISG and OAG: APAC sub-regional accident rate (2013–2022)

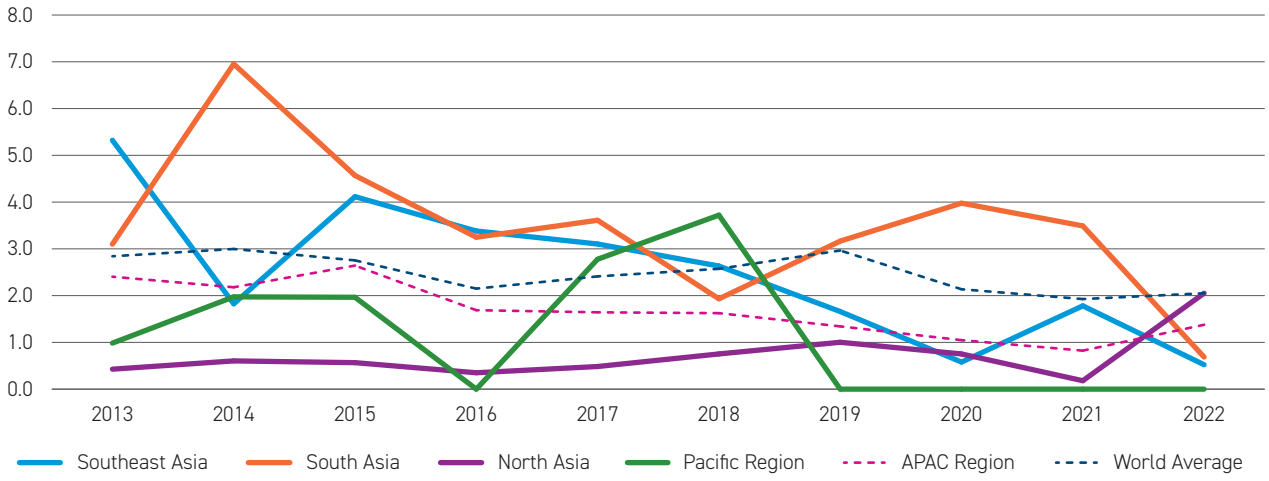


Chart 6.5.2 ICAO iSTARS, SISG and OAG: APAC sub-regional accident rate 5-year Moving Average (2018–2022)

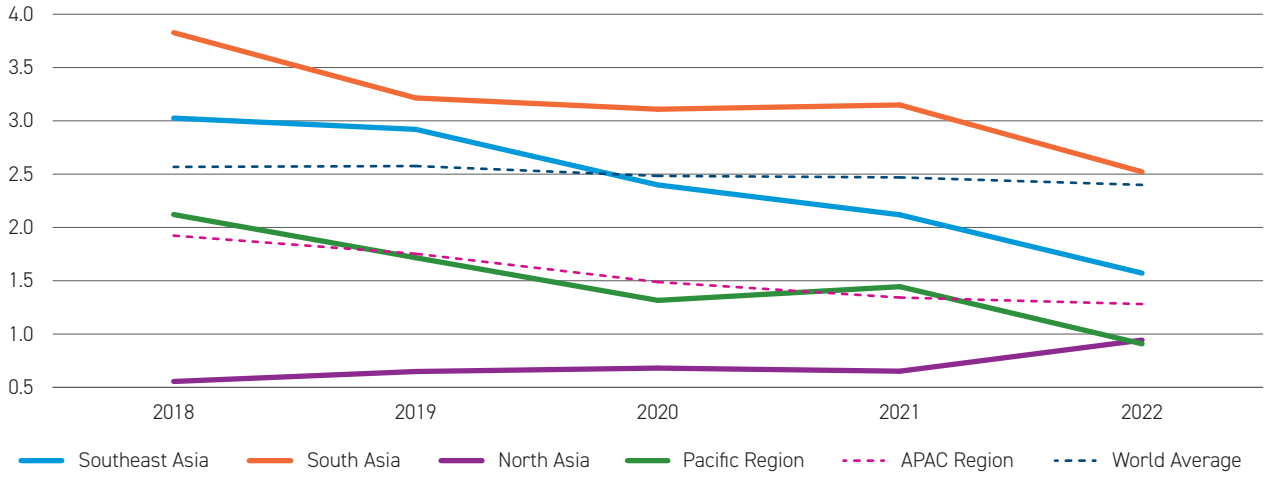


Chart 6.5.1 provides an illustration of the accident rates within APAC by sub-region. The Southeast Asia and South Asia accident rates have decreased from 1.78 and 3.49 in 2021 to 0.52 and 0.69 in 2022 respectively. North Asia's accident rates has increased from 0.18 in 2021 to 2.05 in 2022 whereas the Pacific region continues to maintain zero accidents since 2019. All sub-regions' accident rates except for the North Asia region were below the global average rate of 2.05 for 2022.

The five-year moving average for accident rates in APAC is presented in Chart 6.5.2. The data shows a reduction in the accident rate trend since 2018 for all sub-regions, except for North Asia region. North Asia maintains one of the lowest 5-year average accident rate despite an increase in accident rate in 2022. The five-year moving average accident rates for South Asia at 2.52 remain higher than the global average of 2.40, whereas the other regions are below the global average.

Chart 6.5.3 ICAO iSTARS, SISG and OAG: APAC sub-regional fatal accident rate (2013–2022)

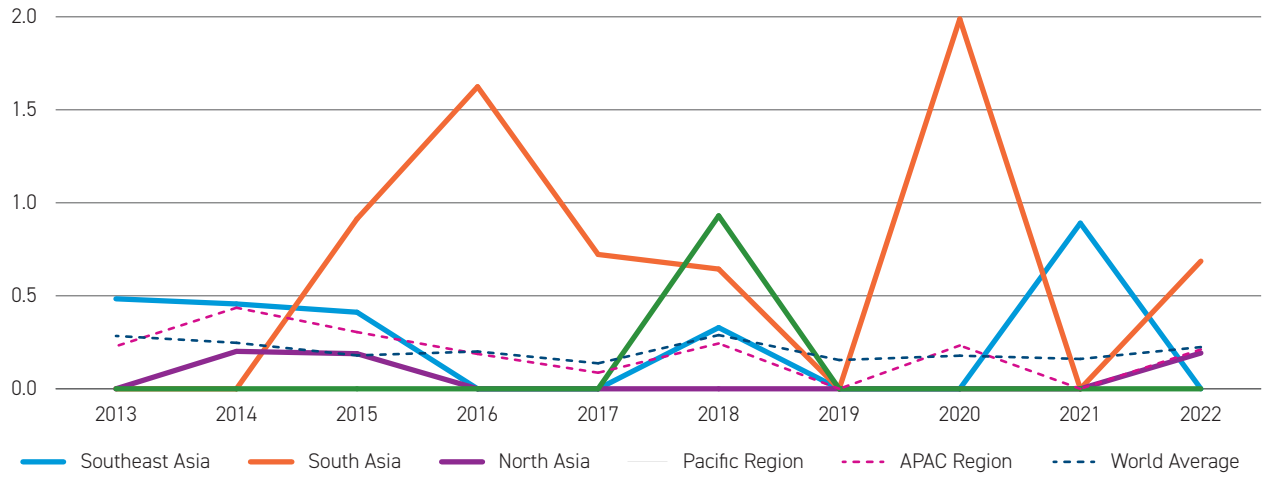


Chart 6.5.4 ICAO iSTARS, SISG and OAG: APAC sub-regional fatal accident rate 5-year Moving Average (2018–2022)

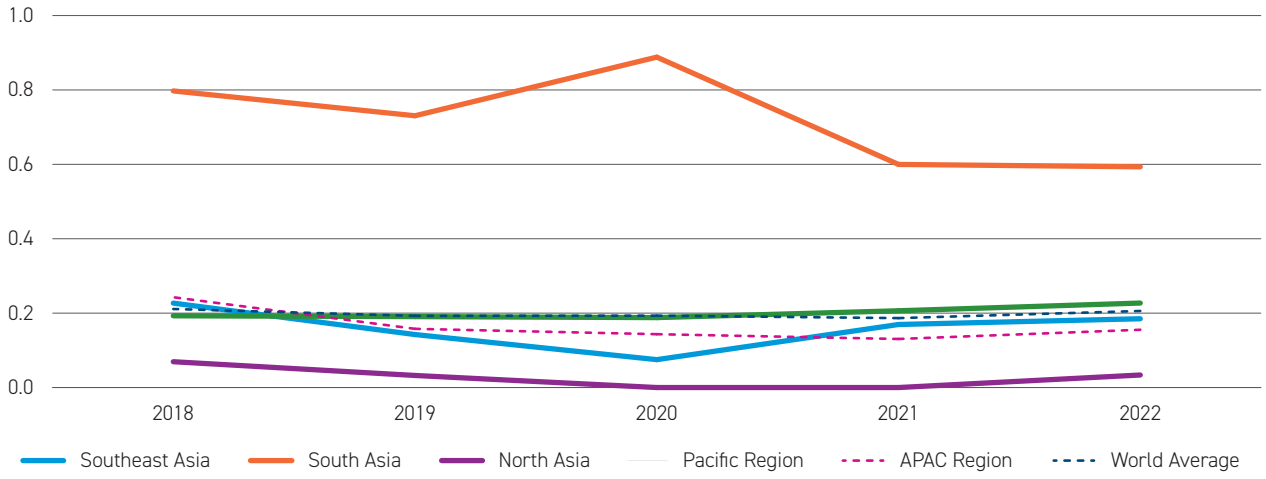


Chart 6.5.3 provides an illustration of the fatal accident rates within APAC by sub-region. The sub-regional fatal accident rate for South Asia and North Asia increased from 0 in 2021 to 0.69 and 0.19 per million departures whereas Southeast Asia and the Pacific was at 0. South Asia's fatal accident rate was significantly higher than both the regional and global fatal accident rates.

As fatal accident rates can vary significantly from year to year, a longer-term trend may present a better understanding of the data. Chart 6.5.4 illustrates the five-year moving average of fatal accident rates by sub-region in APAC. The five-year trend for fatal accident rates remained stable in all sub-regions in 2022. The Pacific and South Asia region' five-year trend at 0.23 and 0.59 per million departures remained higher than global average at 0.21 per million departures

Chart 6.5.5 indicates the breakdown of the accident numbers by sub-regions. In 2022, North Asia region had recorded the highest number of accidents (11). In comparison, The South Asia and Southeast Asia region had recorded 1 accident each in 2022. There were no accidents in Southeast Asia and Pacific region. Over the ten-year period from 2013–2022, the Southeast Asia region had the highest number of accidents (55), followed by North Asia (39) and South Asia (34). The Pacific region has the lowest number of accidents at 11.

Chart 6.5.6 indicates the breakdown of the fatal accident numbers by sub-regions. In 2022, North Asia region and the South Asia region each recorded 1 fatal accident. There were no accidents in the other sub-regions. Over the ten-year period from 2013–2022, the South Asia region had the highest number of fatal accidents (8), followed by Southeast Asia (5) and North Asia (3). The Pacific region has the lowest number of accidents at one (1).

Chart 6.5.5 iSTARS, SISG and OAG: APAC sub-region accident numbers (2013–2022)

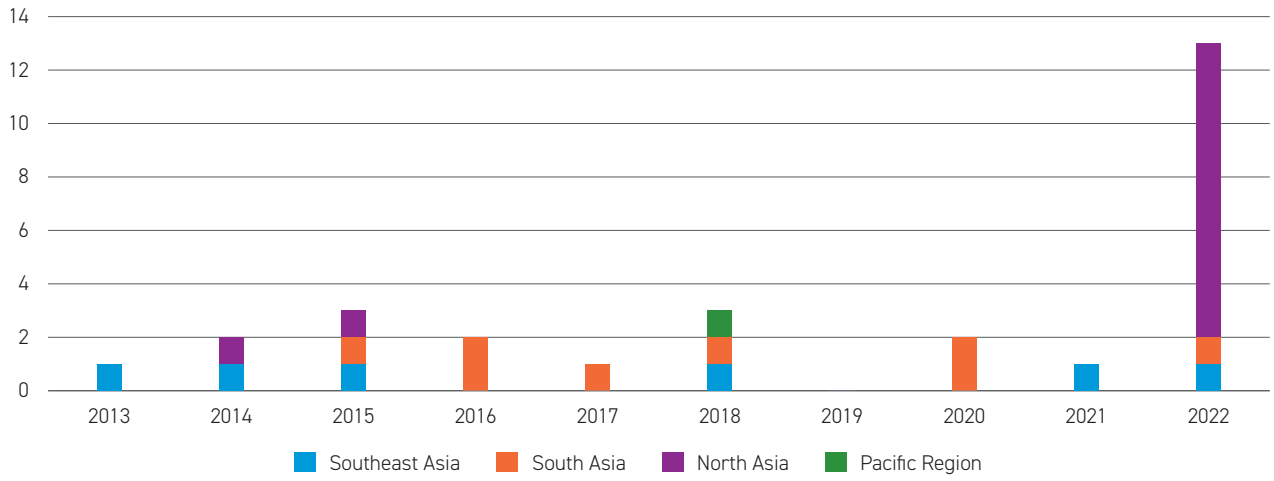


Chart 6.5.6 iSTARS, SISG and OAG: APAC sub-region fatal accident numbers (2013–2022)

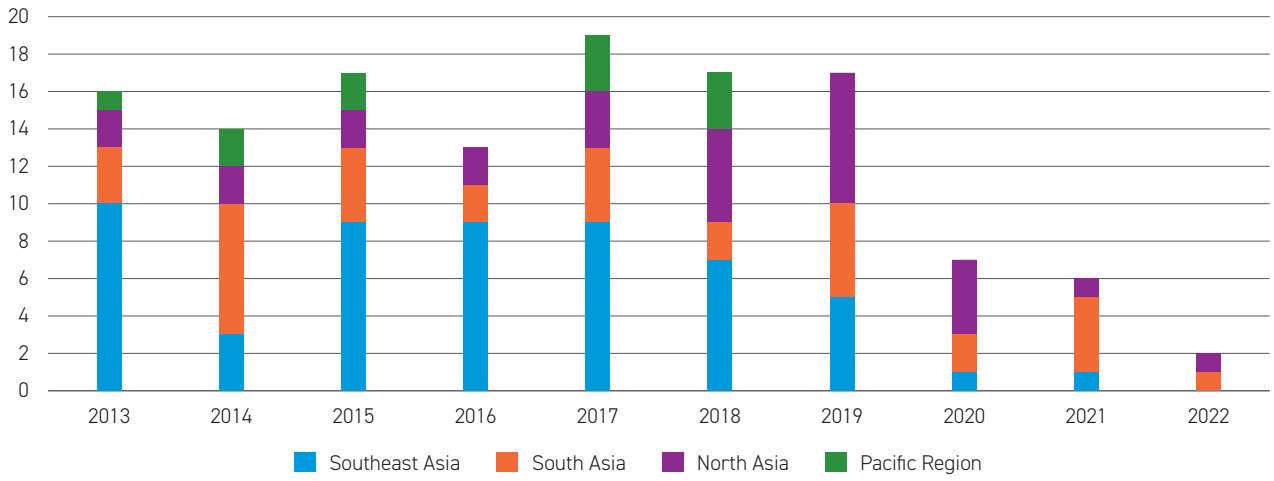


Table 6.5.1 iSTARS, SISG: APAC sub-region top three accident categories (2018–2022)

	SEA	SA	NA	PA
TURB	2	4	14	1
F-NI	0	0	2	0
RE	4	4	4	1
WSTR	1	0	0	0
OTH	0	0	1	0
USOS	0	0	0	1
LOC-I	2	0	0	0
CFIT	0	0	0	0
ADRM	0	0	0	0
ARC	5	6	4	0
RAMP	1	0	0	0
NAV	1	0	0	0
CTOL	0	1	0	0
GCOL	0	0	0	2
AMAN	0	1	1	0
CABIN	0	0	2	0

Table 6.5.1 shows the breakdown of the top three accident categories by APAC sub-regions.

For the SEA sub-region, the top three accident categories were (i) Abnormal Runway Contact (ARC) (ii) Runway Excursion (RE) and (iii) Turbulence (TURB) respectively.

For the SA sub-region, the top three accident categories were (i) ARC (ii) RE and (iii) TURB respectively.

For the NA sub-region, the top three accident categories were (i) TURB (ii) ARC and (iii) RE.

For the Pacific sub-region, the top accident category was Ground Collison (GCOL), followed by turbulence and runway excursion.

07 Proactive Safety Information

Proactive safety information is gathered through analysis of existing or real-time situations, a primary function of the safety assurance team with its audits, evaluations, employee reporting, and associated analysis and assessment processes. These involve actively seeking hazards in the existing processes (ICAO Doc 9859).

This information can be obtained from a number of sources, but this report focuses on the ICAO universal safety oversight audit programme continuous monitoring approach (USOAP CMA).

7.1 ICAO Universal Oversight Audit Programme Continuous Monitoring Approach (USOAP CMA)

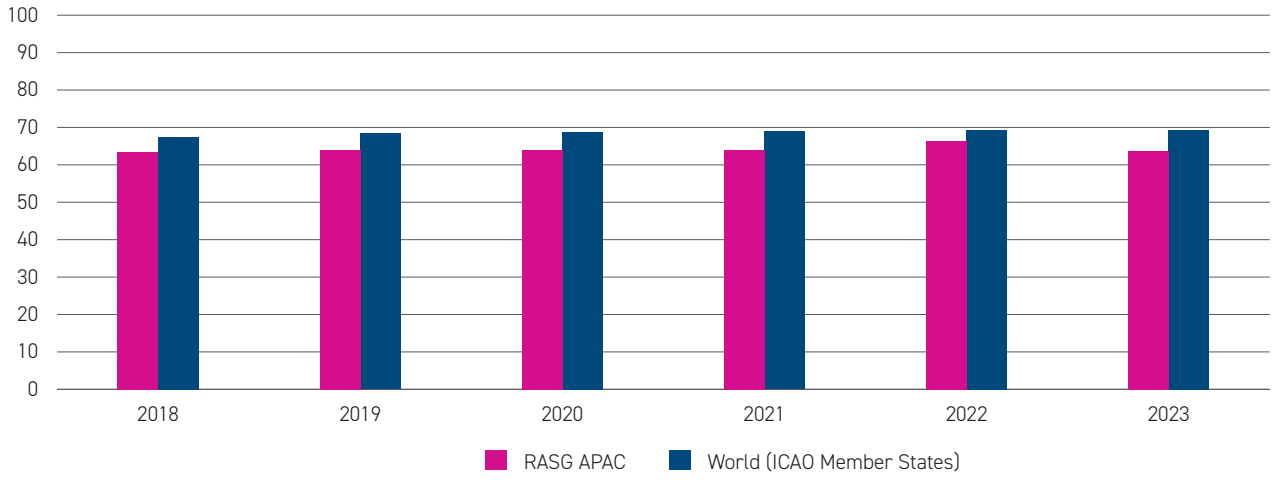
USOAP audits focus on a State's capability to provide safety oversight by assessing whether it has effectively and consistently implemented the critical elements (CE) of a safety oversight system. It also determines the State's level of implementation of ICAO's safety-related standards and recommended practices (SARPs), associated procedures and guidance material. Eight critical elements are evaluated:

1. Primary aviation legislation
2. Specific operating regulations
3. State civil aviation system and safety oversight functions
4. Technical personnel qualifications and training
5. Technical guidance, tools and the provision of safety-critical information
6. Licensing, certification, authorisation and approval obligations
7. Surveillance obligations
8. Resolution of safety concerns

The USOAP CMA programme was launched in January 2013. Comprehensive information relating to USOAP CMA is available on the USOAP CMA online framework at **www.icao.int/usoap**

The overall effective implementation (EI) for the RASG-APAC region in 2023 decreased to 63.62 per cent (as shown in Chart 7.1.1). The EI score was reasonably below the global level which was 69.32 per cent.

Chart 7.1.1 RASG-APAC overall effective implementation

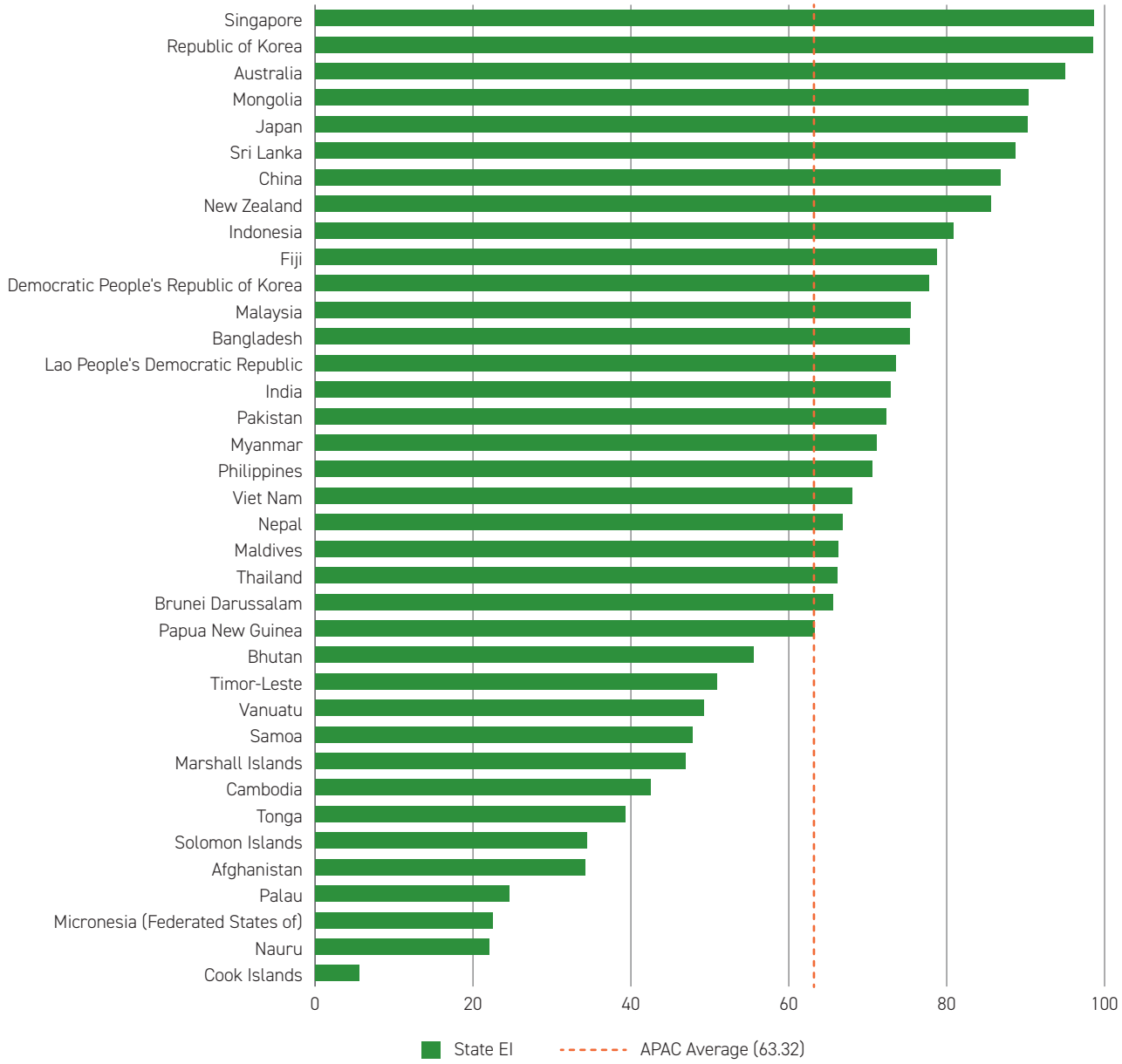


Note – Data was extracted from the iSTARS database on the 8 May 2023.

Chart 7.1.2 illustrates the overall EI by State. It should be noted that any changes or improvements to a State's EI can only be reflected after one of the following is conducted:

- Comprehensive systems approach (CSA) audit
- ICAO coordinated validated mission
- Integrated validated mission
- Off-site monitoring activity
- Off-site Safety System Concern (SSC) protocol questions management activity

Chart 7.1.2 Overall EI for RASG-APAC States

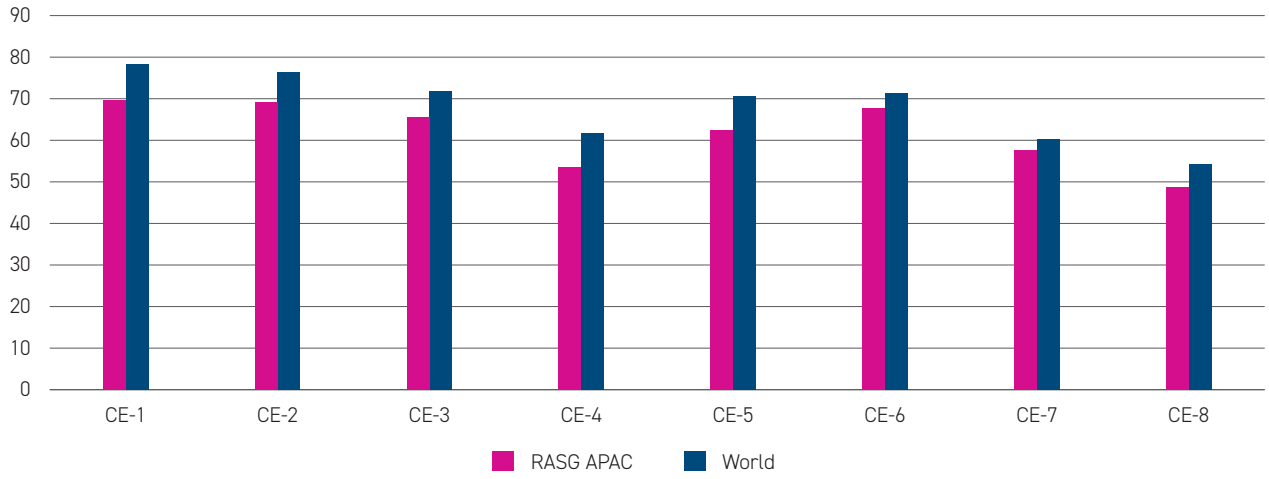


Note – Data was extracted from the iSTARS database on the 8 May 2023.

The EI by critical elements (CE) in Chart 7.1.3, revealed that resolution of safety concerns (CE 8) had the lowest implementation score of 48.8 per cent for the RASG-APAC, followed by CE 4 (53.52 per cent) and CE 7 (57.58 per cent) respectively. In comparison to all ICAO member States, RASG-APAC had lower average scores for all CEs with Certification and Approval Obligations (CE6) being the closest in comparison.

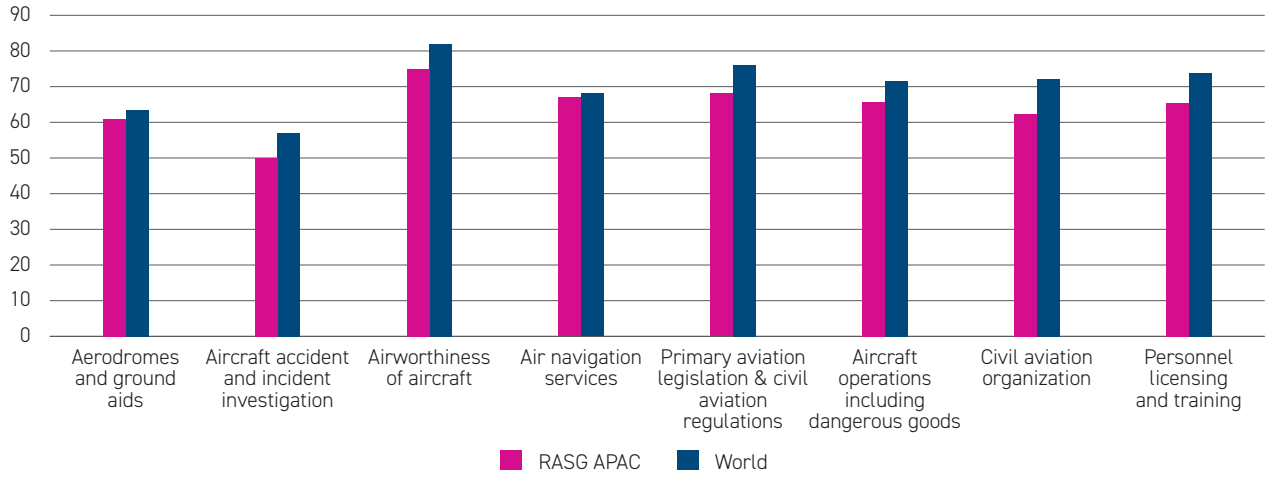
Chart 7.1.4 displays the overall EI by USOAP audit area compared to all ICAO member States. The data indicates that the RASG-APAC had a lower score for all areas compared to the world averages.

Chart 7.1.3 Overall EI by critical element RASG-APAC States compared to all ICAO member States



Note – Data was extracted from the iSTARS database on the 8 May 2023.

Chart 7.1.4 Overall EI by area RASG-APAC States compared to all ICAO member States



Note – Data was extracted from the iSTARS database on the 8 May 2023.

08 Conclusion

Reactive safety information

The APAC accident rate has recorded an upward trend in 2022 in line with global trends. The RASG-APAC's accident rate has remained lower than the global accident rate over the past decade. Overall, the five-year moving average accident rate, globally and for RASG-APAC, has shown a consistent downward trend

In 2022, turbulence accounted for more than half of the accidents in APAC (7), followed by runway excursion (3). From 2018 to 2022, the three most common accident categories in APAC region were: (i) Turbulence (ii) Runway Excursion and (iii) Abnormal Runway Contact. The top contributing categories for accidents based on IATA's data, which is defined as the categories with contributing factors with the highest scores, are (i) Flight Crew Errors (ii) Latent conditions and (iii) Countermeasures. The APAC region should focus its attention on addressing risks arising from the top accident categories as well as the contributory factors.

Proactive safety information

The effective implementation (EI) score for the RASG-APAC region decreased in 2023 (63.62 per cent) as compared to 2022 (66.35 per cent). The EI for RASG-APAC region was lower than global average by Critical Element (CE). Of these, *technical personnel qualifications and training (CE4)* and *Resolution of safety concerns (CE–8)* were lowest at 53.52 and 48.80 per cent respectively. Both of these critical elements also contain scores among the lowest across the global averages, suggesting that they appear to be a consistent issue across the world.

09 List of acronyms

ACAS	Airborne collision avoidance systems
ADRM	Aerodrome
AFI	Africa (IATA Region)
AIS	Aeronautical information service
AMAN	Abrupt manoeuvre
ANSP	Air navigation service provider
AOC	Air operator certificate
APAC	Asia Pacific
APR	Approach
ARC	Abnormal runway contact
ASIA PAC	Asia/Pacific (ICAO Region)
ASPAC	Asia/Pacific (IATA Region)
ATC	Air traffic control
ATM	Air traffic management
BIRD	Birdstrike
CABIN	Cabin safety events
CAST	Commercial aviation safety team
CFIT	Controlled flight into terrain
CICTT	CAST/ICAO Common Taxonomy Team
CIS	Commonwealth of Independent States (IATA Region)
CMA	Continuous monitoring approach
CRM	Crew resource management
CRZ	Cruise
CVR	Cockpit voice recorder
DFDR	Digital flight data recorder
DGAC	Directorate general of civil aviation
DGCA	Directors General of Civil Aviation Conference
DH	Decision height
E-GPWS	Enhanced ground proximity warning system
ETOPS	Extended range operations by turbine-engine aeroplanes
EDTO	Extended Diversion Time Operations (replaces ETOPS)
EUR	Europe (ICAO and IATA Region)
EVAC	Evacuation
FDA	Flight data analysis
FLP	Flight planning (IATA)
F-NI	Fire/smoke (none- impact)
FMS	Flight management system
FOQA	Flight operations quality assurance
F-POST	Fire/smoke (post-impact)
FUEL	Fuel related
GASP	ICAO global aviation safety plan
GCOL	Ground collision
GNSS	Global navigation satellite system
GOA	Go-around
GPWS	Ground proximity warning system
GSI	Global safety initiative
HL	Hull loss. Aircraft destroyed, or damaged and not repaired
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICE	Icing
ICL	Initial Climb
IMC	Instrument meteorological conditions
INOP	Inoperative
IOSA	IATA operational safety audit
iSTARS	Integrated Safety Trend Analysis and Reporting System
LALT	Low altitude operations
LATAM	Latin America and the Caribbean (IATA Region)
LEI	Lack of effective implementation
LND	Landing
LOC-G	Loss of control-ground
LOC-I	Loss of control-inflight
LOSA	Line operations safety audit
MAC	AIRPROX/TCAS alert/loss of separation/ near miss collisions/mid-air collisions
MDA	Minimum descent altitude
MED	Medical
MEL	Minimum equipment list
MENA	Middle East and North Africa (IATA REGION)

NAM	North America (ICAO and IATA Region)
NASIA	North Asia (IATA Region)
NAVAIDS	Navigational aids
NOTAM	Notice to airman
OAG	Official Aviation Guide
OTH	Other
RA	Resolution advisory
RAMP	Ground handling operations
RE	Runway excursion (departure or landing)
RE-Landing	Runway excursion – Landing
Re-Take-off	Runway excursion -Take-off
RI	Runway incursion
RI-A	Runway incursion – animal
RI-VAP	Runway incursion – vehicle, aircraft or person
RS	Runway safety
RTO	Rejected Take-off
SAM	South America (ICAO Region)
SARPS	Standards and recommended practices (ICAO)
SCF-NP	System/component failure or malfunction – Non-powerplant
SCF-PP	System/component failure or malfunction – Powerplant
SD	Substantial damage
SEC	Security-related
SISG	Safety Indicator Study Group (ICAO)
SMS	Safety management system
SOP	Standard operating procedure
SRVSOP	Regional safety oversight system
SSP	State safety programme
TAWS	Terrain awareness warning system
TCAS	Traffic collision and avoidance system
TCAS RA	Traffic collision and avoidance system – Resolution advisory
TEM	Threat and error management
TOF	Take-off
TURB	Turbulence encounter
TXI	Taxi
UAS	Undesirable aircraft state
UNK	Unknown or undetermined
USOAP	Universal safety oversight audit programme
USOS	Undershoot/overshoot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