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AFI Annual Safety and Air Navigation Report (ASANR)

Edition, December 2024

PREPARED BY THE SECRETARIAT OF AASPG WITH THE ASSISTANCE OF AASPG MEMBERS

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FOREWORD



Mrs. Paule Assoumou Koki,
Director General, Cameroon Civil Aviation Authority
Chairperson of the AASPG

Distinguished Members of the Africa-Indian Ocean Aviation System Planning and Implementation Group (AASPG) and fellow readers of the AASPG Annual aviation and air navigation report. The AASPG has started its journey as the result of the merging of the APIRG (Africa-Indian Ocean Planning and Implementation Regional Group) and the Africa-Indian Ocean Regional Aviation Safety Group (RASG-AFI) the formal two high-level groups that were respectively mandated for air navigation and aviation safety business for the Africa-Indian Ocean Region (AFI). The establishment of AASPG has brought some significant changes to the conduct of aviation business in the region, including the development and publication of the annual report for safety and air navigation activities.

The first Meeting of AASPG, held in November 2025 in Libreville Gabon, through Decision 1/32 endorsed the publication of the 2024 annual report as a single integrated document featuring safety and air navigation matters. This new approach to the annual reporting aims at aligning with the AASPG vision of an AFI aviation system as a single entity with the same goal of keeping civil aviation safe, accessible and reliable for all.

In this regard, this very first edition of the annual AFI Aviation system report is provided in two parts respectively that dive into safety events and initiatives as well as air navigation initiatives and achievements recorded in 2024. From a safety perspective, the first part of the report addresses issues pertaining to State Safety Programme (SSP), USOAP CMA activities in AFI, safety events analysis as well as accidents occurrences during the year 2024. In the second part, aspects concerning air navigation planning and implementation matters are dealt with and more specifically, the report provides updated information on the status of implementation of essential air navigation services also known as Basic building blocks (BBBs) and the level of progress achieved in the implementation of their modernization through the Aviation System Block Upgrade (ASBU) selected elements applicable to the region. Part two also pays credit to regional initiatives carried out by States and the industry in advancing the aviation business in the AFI region.

The release of this report provides an opportunity for our dear readers and the AFI aviation stakeholders to update their awareness of the progress achieved in the development of an increasingly safer air navigation system in the AFI region. It also raises some outstanding challenges which our collaborative efforts are required to respond to.

The publication of the report was possible thanks to the engagement and the professionalism of the editorial team and the continued collaboration of States and the industry which supplied consistent data and information to support the timely release of this deliverable.

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As Principal Secretaries of the Africa-Indian Ocean Aviation System Planning and implementation Group (AASPG), we are pleased to introduce our able Reporting Team that worked very hard to coordinate with the States, organizations and aviation industry, and compile the information and data contained in this 2024 Edition of the Annual Safety and Air Navigation Report.

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ACRONYMES & ABBREVIATIONS

AASPG – Africa-Indian Ocean Aviation System Planning and implementation Group
ACC – Area Control Centre
ACI – Airports Council International
AFI – Africa-Indian Ocean
AFI-CIS – AFI Cooperative Inspectorate Scheme
AFI-RASP – Regional Aviation Safety Plan for Africa-Indian Ocean
AFPP – African Flight Procedures Programme
AIG – Accident and Incident Investigation
AIAG – AFI ATS Incident Analysis Group
ANC – Air Navigation Commission
ANSPs – Air Navigation Service Providers
AOC – Air Operator Certificate
APAC – Asia Pacific
ARC – Abnormal Runway Contact
ASBU – Aviation System Block Upgrade
ASR – Annual Safety Report
ASRT – Annual Safety Report Team
ATC – Air Traffic Control
ATM – Air Traffic Management
ATS – Air Traffic Services
BBB – Basic Building Blocks
CAA – Civil Aviation Authority
CCO/CDO – Continuous Climb Operations/ Continuous Descent Operations
COSCAP – Cooperative Development of Operational Safety and Continuing Airworthiness Programme
ESAF – Eastern and Southern Africa
ESI – Emerging Safety Issues
EUR – Europe
FIR – Flight Information Region
FLT – Flight
FSO – Fundamentals of Safety Oversight
GASP – Global Aviation Safety Plan
GCOL – Ground Collision
GOA – Ground Operations Agent (ISAGO)
IATA – International Air Transport Association
ICAO – International Civil Aviation Organization
GADM – Global Aviation Data Management
ICVM – ICAO Coordinated Validation Mission
IFALPA – International Federation of Airline Pilots' Association
IFATCA – International Federation of Air Traffic Controllers' Association
IFBP – In-Flight Broadcasting Procedures

IOSA – IATA Operational Safety Audit
 ISAGO – IATA Safety Audit of Ground Operations
 LATAM – Latin America
 MENA – Middle East and North Africa
 MID – Middle East
 MIR – Mandatory Information Request
 MNT – Maintenance
 MoC – Memorandum of Cooperation
 NAM – North America
 NASP – National Aviation Safety Plan
 NAT – North Atlantic
 ORG – Organization and Management
 OSVA – Off-site Validation Activity
 PA – Pan American
 PRCC – Programme Review and Coordination Committee
 RAIO – Regional Aircraft Accident Investigation Organization
 RASC – RASG AFI Steering Committee RASG – AFI (RASC and APCC merged as PRCC)
 RASG-AFI – Regional Aviation Safety Group for Africa-Indian Ocean (RASG-AFI and APIRG merged as AASPG)
 RASP – Regional Aviation Safety Plan
 RCC – Rescue Coordination Center
 REC – Regional Economic Community
 RE – Runway Excursion
 RI – Runway Incursion
 RSC – Rescue Sub Center
 RSOO – Regional Safety Oversight Organization
 RWY – Runway
 SAM – South America
 SAR – Search and Rescue
 SARPs – Standards and Recommended Practices
 SCF-PP – Systems Component Failure Powerplant
 SCF-NP – Systems/Component Failure or malfunction, Non-Powerplant
 SMO/SG – Safety Management and Oversight Sub-Group of the AASPG
 SMS – Safety Management Systems SSC – Significant Safety Concerns
 SSC – Significant Safety Concerns
 SSP – State Safety Programme
 SST – Safety Support Team
 TWY – Taxiway
 UCR-Unsatisfactory Condition Report
 UNK - Unknown
 USOAP CMA – Universal Safety Oversight Audit Programme Continuous Monitoring Approach
 USOS – Undershoot/Overshoot
 WACAF – Western and Central Africa

INTRODUCTION

0.1. Scope

0.1.1. This 2024 Edition of the AASPG Annual Report covers matters pertaining to safety and air navigation implementation in Africa-Indian Ocean region in the period between January and December 2024.

0.1.2. The report covers forty-eight (48) Africa Indian-Ocean States including

- ✓ twenty-four (24) in the ICAO Eastern and Southern Africa area of accreditation (ESAF): Angola, Botswana, Burundi, Comoros, Djibouti, Eritrea, Eswatini, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Seychelles, Somalia, South Africa, South Sudan, Uganda, United Republic of Tanzania, Zambia, and Zimbabwe; and
- ✓ twenty-four (24) in the ICAO Western and Central Africa area of accreditation (WACAF):

Benin, Burkina Faso, Cameroon, Cabo Verde, Central African Republic, Chad, Congo, Cote d'Ivoire, Democratic Republic of Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea Bissau, Guinea, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome & Principe, Senegal, Sierra Leone, and Togo.



Figure 1-AFI States

0.2. Organizational structure of the AASPG

0.2.1. The Africa-Indian Ocean Aviation System Planning and Implementation Group (AASPG) is the regional aviation body specialized in aviation safety and air navigation planning and implementation matters. AASPG gathers forty-eight (48) States and was established in July 2024 in Libreville, Gabon following the merging of the Regional Aviation Safety Group for AFI (RASG-AFI) and the Africa-Indian Ocean Planning and Implementation Regional Group. The current structure of AASPG is made of four contributory bodies as shown in the picture below.

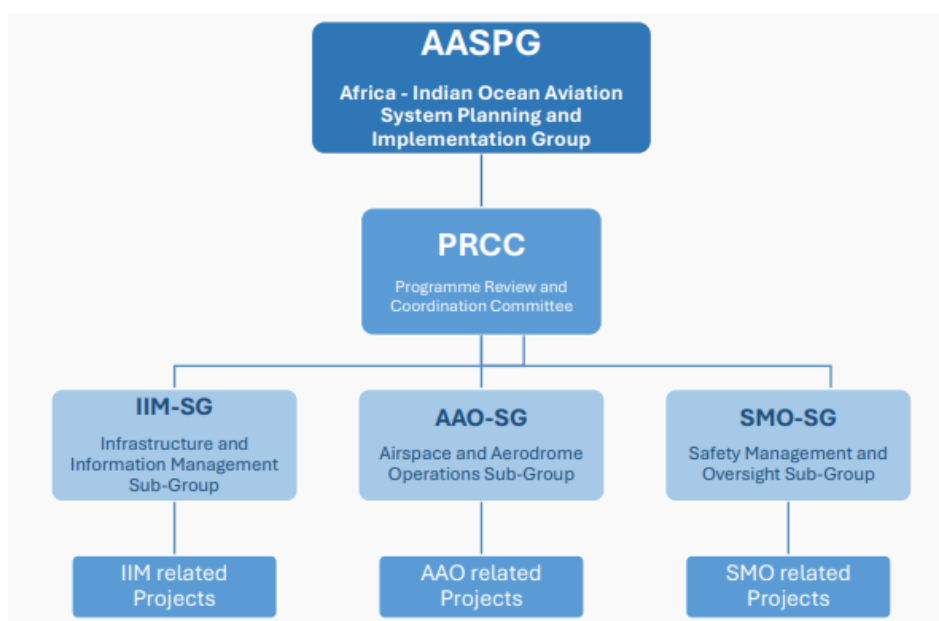


Figure 2-AASPG Organizational structure

0.3. Collection of data

0.3.1. Information and data used in this report were collected from AFI States, service providers, regional safety organizations, regional accident investigation organizations, ICAO activities report and documentation resources. Data and information collected through data request forms and correspondences were validated by the editorial team against data quality criteria such as data reliability, integrity, consistency, and accuracy before incorporation into the report.

0.4. Structure of the Report

0.4.1. This first Edition of the Annual Aviation Report is developed through four main parts including a general part which provides background information and process of data collection and processing to produce the report. Part 1 deals with safety related matter including safety information, data and regional and national safety initiatives taken in 2024. Part 2 contains information on air navigation implementation with focus on the status of essential services and infrastructure as well as the level of modernization. It also provides an insight into the regional and national initiatives pertaining to air navigation implementation in the AFI Region. The fourth part highlights a summary of key points that require regional attention and future perspective for the region.

PART 1 – SAFETY

1. EXECUTIVE SUMMARY

1.1. This Eleventh Edition of the AFI Annual Safety Report presents safety information collected from key stakeholders including, ICAO, AFCAC, IATA, Boeing, and other aviation partners. Information related to aviation occurrences in the Region, for the period 2013 to 2024 was used by the Annual Safety Report Team (ASRT) to perform the necessary analyses. The vision of the AFI Region is to achieve and maintain the aspirational safety goal of the zero fatalities in commercial operations by 2030 and beyond as enshrined in the GASP, which is consistent with the United Nations' *2030 Agenda for Sustainable Development*.

1.2. The Annual Safety Report comprises three main sections as follows:

- Reactive safety information
- Proactive safety information
- Predictive safety information

1.3. The reactive safety information section represents the largest portion of the report. It contains analyses of aircraft accident data provided from the different sources, in order to draw conclusions on areas that require much attention and make recommendations for resolving the safety deficiencies by means of mitigating and corrective measures.

1.4. The proactive safety information section provides information based on the results of the ICAO USOAP-CMA activities, IOSA, ISAGO as well as other sources such as occurrences (Incidents) reported by States or operators in order to identify emerging risks in the Region. The ASRT recognizes the need for the region to be more proactive in providing safety data and addressing safety deficiencies; and urges States, aviation industry and other stakeholders, to increase their commitment to the establishment of SSPs/SMS and NASPs.

1.5. Regarding the safety oversight system, seven USOAP- CMA activities were conducted in the Region in 2024: five audits (Benin, Botswana, Guinea, Namibia, Zambia) and two ICVMs (Cote d'Ivoire, Senegal). These activities resulted in increments in the overall EI scores of the concerned States. However, the five significant safety concerns (SSCs) in the area of Air Navigation Services relating to non-calibration of Navigational Aids and non-validation of Flight Procedures, identified in three States (Democratic Republic of Congo (2), Liberia (2) and Zimbabwe (1)) are still unresolved.

1.6. Furthermore, the technical areas with lowest levels of EI are Air Navigation Services (ANS), Aerodromes and Ground Aids (AGA), and Accident and Incident Investigation (AIG). The 2024 data also showed low performance in the area of Aircraft Operations (OPS), thus its inclusion in the list of priorities for the Region.

1.7. The section on predictive safety information provides analyses of the status of safety data management in the region, as well as the implementation status of State Safety Programme (SSP) in the RASG-AFI Region.

1.8. State Safety Programme (SSP) is an integrated set of regulations and activities aimed at improving safety. Goal 3 of the AFI-RASP is aimed at individual States and calls for the implementation of effective SSPs. The goal addresses organizational challenges faced by States when implementing an SSP and includes the implementation of SMS by service providers within individual States, in accordance with Annex 19 to the Chicago Convention. From the ICAO iSTARS and Regional data, the overall weighted average of State Safety Programme (SSP) Implementation in the Region in 2024 was 57.4%.

1.9. AFI is committed to improving aviation safety and fostering cooperation and communication - sharing of safety critical information among the principal aviation safety stakeholders.

Note:

1.10. All accidents statistics sourced from ICAO (ICAO iSTARS) are based on the Country/State of occurrence in the RASG-AFI region.

1.11. All accidents statistics sourced from IATA (IATA GADM) are based on the operator's Country/State of Registry in the AFI region.

1.12. The framework used by RASG-AFI to identify and address safety risks in the Region through Safety Enhancement Initiatives – SEIs (SST), Detailed Implementation Plans – DIP (SST), and Annual Safety Report (ASRT) has been maintained.

2. SAFETY INFORMATION AND ANALYSES

The following sections show the results of safety information analyses in terms of reactive, proactive and predictive safety information.

2.1. REACTIVE SAFETY INFORMATION

2.1.1. The AFI Region has been implementing the Safety Enhancement Initiatives identified by the Region to mitigate the Regional High-Risk Categories of occurrences (R-HRCs) listed in the Regional Aviation Safety Plan for Africa-Indian Ocean (AFI-RASP), Edition 2023-2025, under the context of the number of fatalities and risk of fatalities associated with such events:

- Controlled Flight into Terrain (CFIT);
- Loss of Control In-Flight (LOC-I);
- Mid-Air Collision (MAC);
- Runway Excursion (RE);
- Runway Incursion (RI);
- System/Component Failure/Malfunction – Non-Powerplant (SCF-NP);
- Bird Strikes and Wildlife Hazard;
- Dust Haze; and
- Large Height Deviation (LHD).

The status of implementation of these SEIs is given in the relevant parts of this report.

AFI Accident Rate

2.1.2. The RASG-AFI accident rate (involving scheduled commercial flights on aeroplanes with maximum certificated take-off mass over 5,700 Kg) at the end of 2024 was 4.8 per million departures (an increase from 3.98 in 2023) compared to the world rate of 2.56 (which also increased from 1.82 in 2023). One fatal accident on scheduled commercial flights with aircraft over 5,700 Kg was recorded for the region in 2024 resulting in 2 fatalities.

2.1.3. The Annual Safety Report Team (ASRT) retrieves safety data mainly from ICAO (as reported by States), AFCAC, BOEING, and IATA in order to analyze the available reactive safety information.

2.1.4. Figure 3 below shows the AFI Accident Rate involving scheduled commercial flights on aeroplanes above 5,700 Kg Maximum Certificated Take-off Mass.

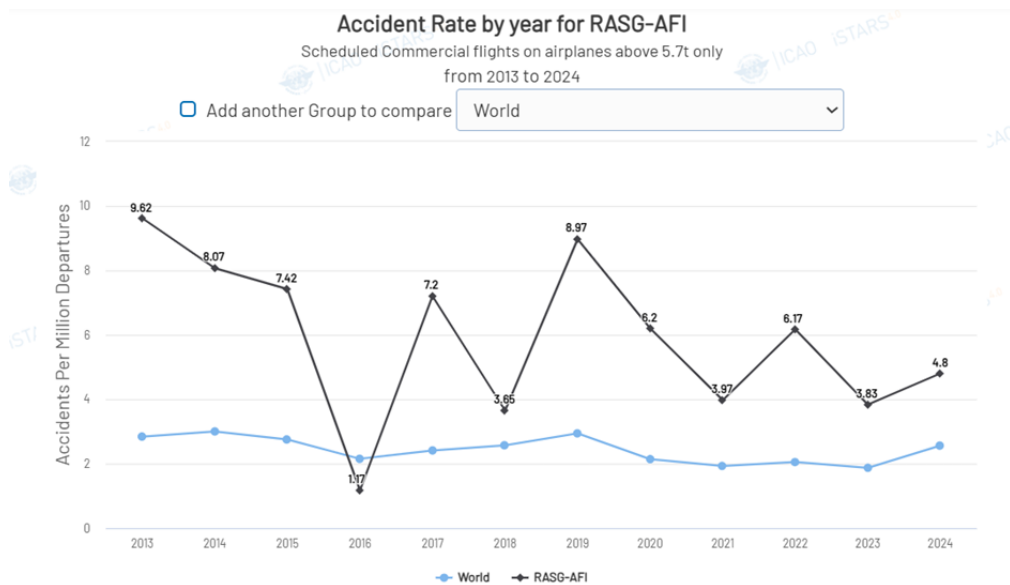


Figure 3: AFI Accident Rate

World Accident Rate in 2024: 2.56 per Million departures

RASG-AFI Accident Rate in 2024: 4.8 per Million departures

Source: ICAO

iSTARS

AFI Fatal Accident

- 2.1.5. The vision of the GASP is to achieve and maintain the aspirational safety goal of zero fatalities in commercial operations by 2030 and beyond, which is consistent with the United Nations' *2030 Agenda for Sustainable Development*. The plan's mission is to continually enhance the global aviation safety performance (and in consequence the regional aviation safety performance) and resilience by providing a collaborative framework for States and industry.
- 2.1.6. The AFI Region had one fatal accident on scheduled commercial flights with aircraft over 5,700 Kg in 2024 (compared to zero fatal accident in 2023). See Figure 4b below.

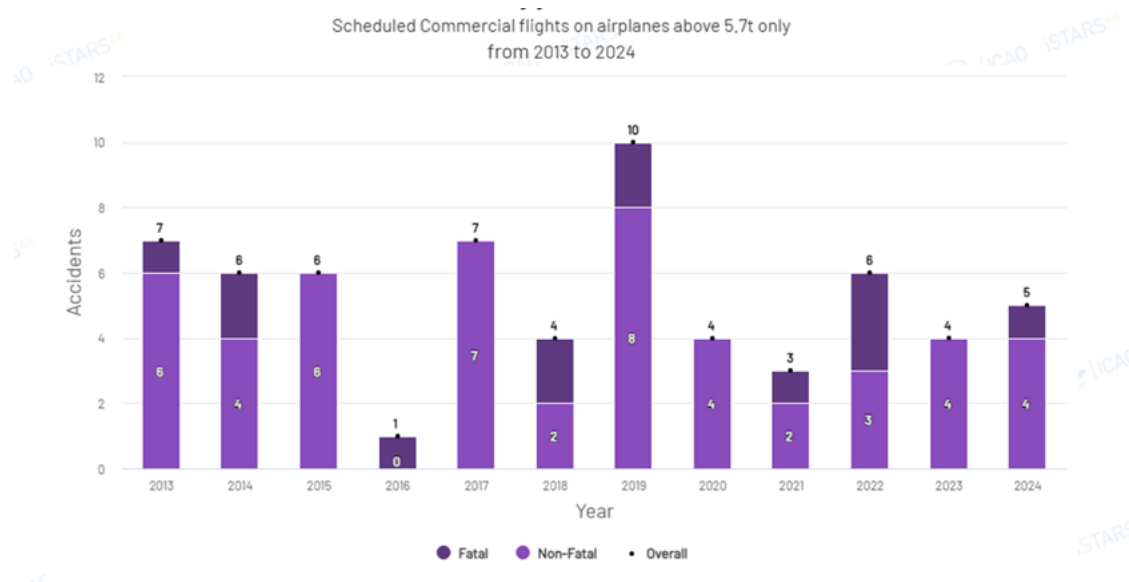


Figure 4: Comparison of Number of Accidents and Fatalities by Year for the AFI Region.

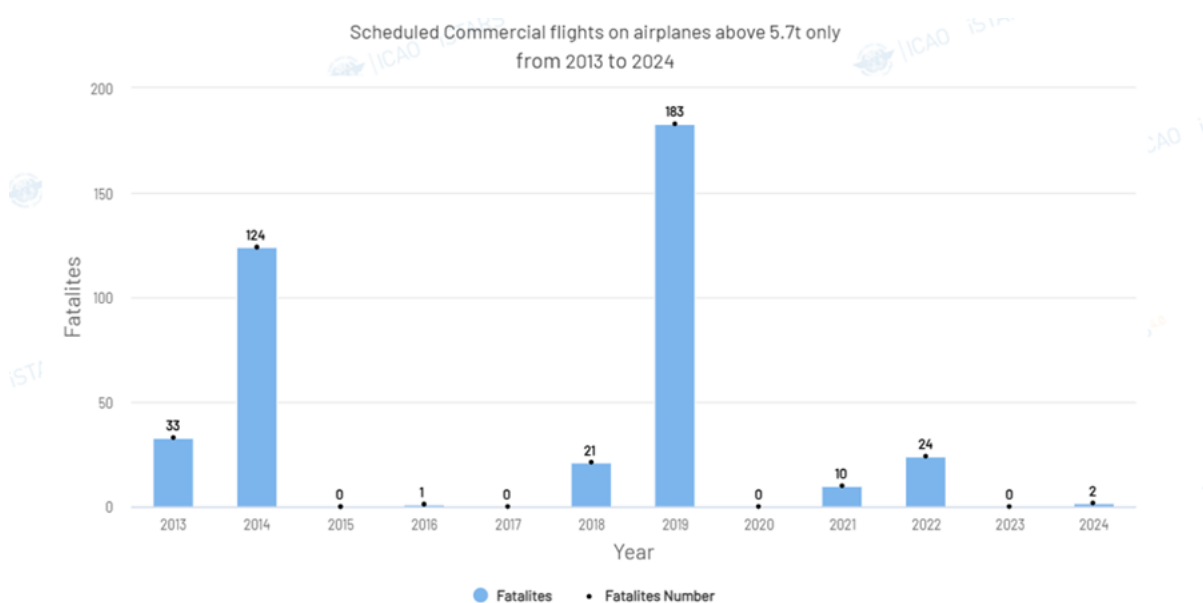


Figure 4a: Fatalities by Year

World Fatal Accident Rate in 2024: **0.27** per Million departure

RASG-AFI fatal Accident Rate in 2024: **0.96** per Million departure

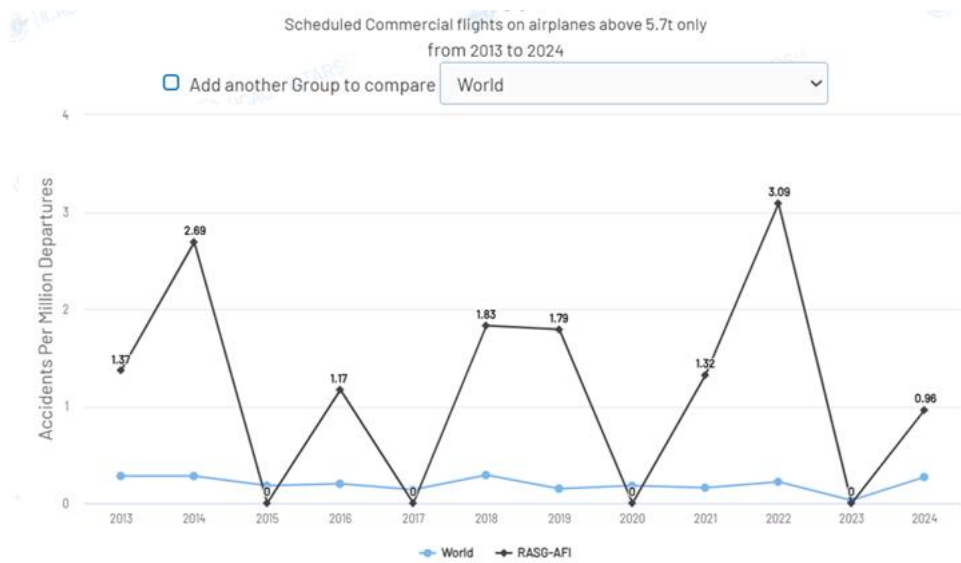


Figure 5: Accidents by Year *Source: ICAO iSTARS*



Figure 6: Fatal Accident Rate by Year for the AFI Region

Source: ICAO iSTARS

The World and Regional Air Traffic Volume and Accident Data for 2024

2.1.7. Table 1 below compares the air traffic volume, number of accidents, accident rates, and fatalities by the world and sub-regions for 2024. The accident rate in the AFI Region has increased from 3.98 per million departures in 2023 to 4.8 in 2024; and the number of accidents increased from 4 in 2023 to 5 in 2024. There was also an increase in the number of fatalities, from 0 in 2023 to 2 in 2024.

- 2.1.8. The traffic volume continues to show upward trend, with an increase from One Million departures in 2023 to 1.04 million departures in 2024 for the Region.

Table 1: The World and Regional Air Traffic Volume and Accident Data for 2024

Sub-Region	Departures	Number of Accidents	Accident Rate (per million departures)	Number of Fatalities
RASG-AFI	1.04 M	5	4.8	2
RASG-APAC	11.96 M	22	1.84	185
RASG-EUR	8.98 M	22	2.45	40
RASG-MID	1.44 M	2	1.39	1
RASG-PA	12.92 M	42	3.25	68
World (ICAO Member States)	36.34 M	93	2.56	296

Source: ICAO iSTARS

Further Analyses of the AFI Region Accidents between 2015 and 2024

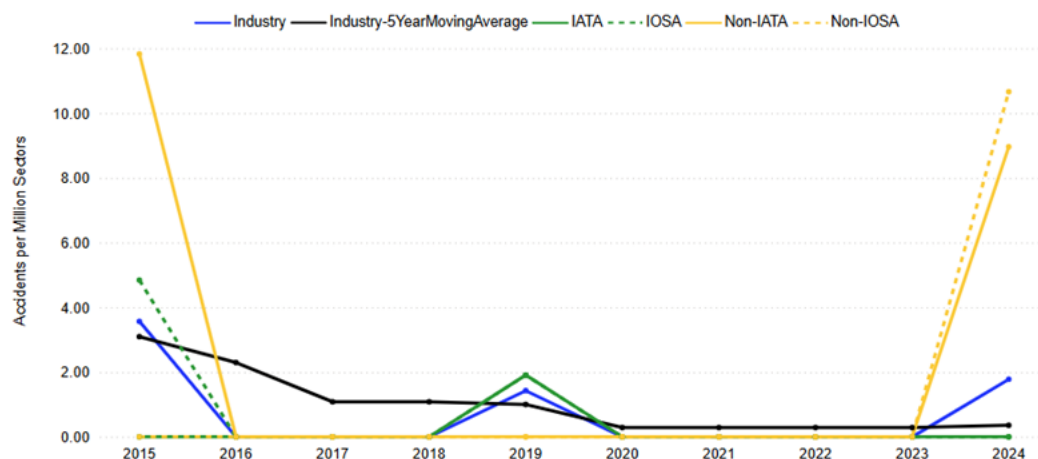
- 2.1.9. The International Air Transport Association (IATA) has analyzed accident data covering the period 2015– 2024, according to Jet damage type (hull loss) and Turboprop damage type (hull loss), as depicted below in Figures 7a and 7b. The AFI Region High-Risk Accident Trend (2015 – 2024) is provided in Figures 8a, 8b and 8c; and the Hull Loss and/or Fatality Risk for the same period is shown in Figure 9.
- 2.1.10. The graph below, Figure 7a, shows the accident rate according to the Jet damage type (hull loss) for AFI for the period 2014- 2024.

Figure 7: Damage Type (Hull Loss) AFI (2015- 2024)

Figure 7a: Jet Damage Type (Hull Loss) AFI (2015- 2024)

Accidents	Fatal Accidents	Fatalities Onboard	Other Fatalities	Jet	Turboprop	Passenger	Cargo	IATA	IOSA
4	1	157	0	4	0	2	2	1	3

Accident Rate (per Million Sectors) by Year * Data source IATA



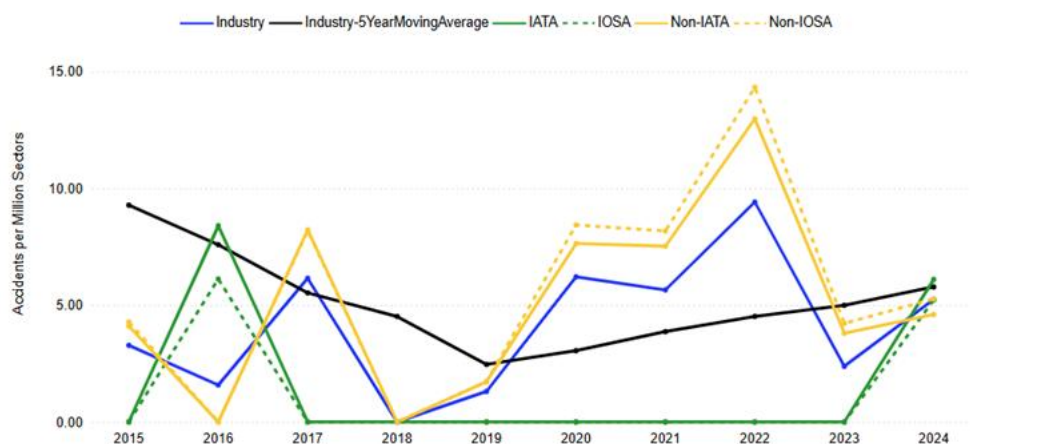
Accidents and Fatalities Onboard by Year * Data source IATA

2.1.11. The graph below shows the accident rate according to the Turboprop damage type (hull loss) for AFI for the period 2015 - 2024.

Figure 7b: Turboprop Damage Type (Hull Loss) AFI (2015-2024)

Accidents	Fatal Accidents	Fatalities Onboard	Other Fatalities	Jet	Turboprop	Passenger	Cargo	IATA	IOSA
19	7	79	7	0	19	9	9	2	2

Accident Rate (per Million Sectors) by Year * Data source IATA



Accidents and Fatalities Onboard by Year * Data source IATA

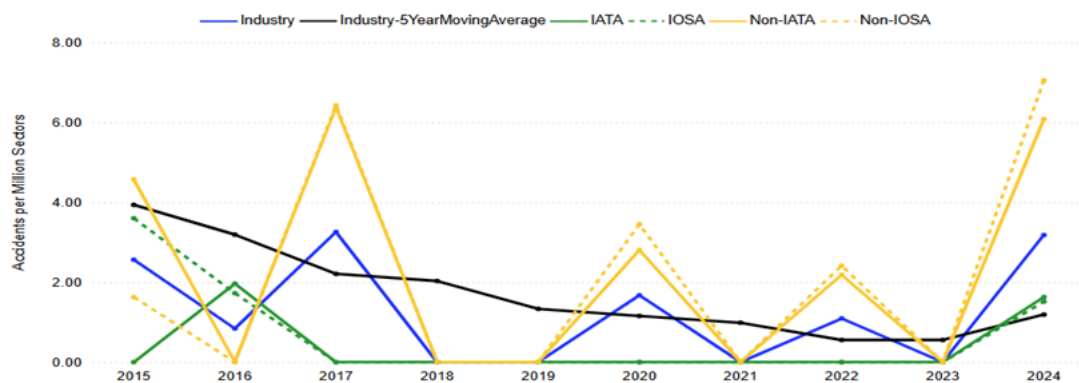
Source: IATA Interactive Safety Report

Figure 8: AFI Region High-Risk Accident Trend (2015 – 2024)

Figure 8a: Runway Safety Related Accidents (Jet & Turboprop, 2015 – 2024)

Accidents	Fatal Accidents	Fatalities Onboard	Other Fatalities	Jet	Turboprop	Passenger	Cargo	IATA	IOSA
13	0	0	0	3	10	6	7	2	4

Accident Rate (per Million Sectors) by Year * Data source IATA



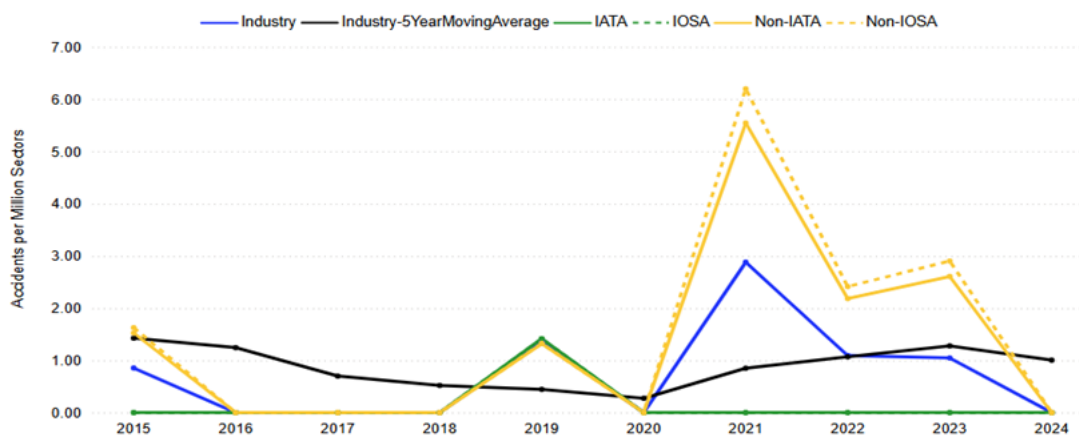
Accidents and Fatalities Onboard by Year * Data source IATA

Source: IATA Interactive Safety Report

Figure 8b: Loss of Control In-flight (LOC-I) Accidents (Jet & Turboprop, 2015 – 2024)

Accidents	Fatal Accidents	Fatalities Onboard	Other Fatalities	Jet	Turboprop	Passenger	Cargo	IATA	IOSA
7	5	226	7	1	6	5	1	1	1

Accident Rate (per Million Sectors) by Year * Data source IATA



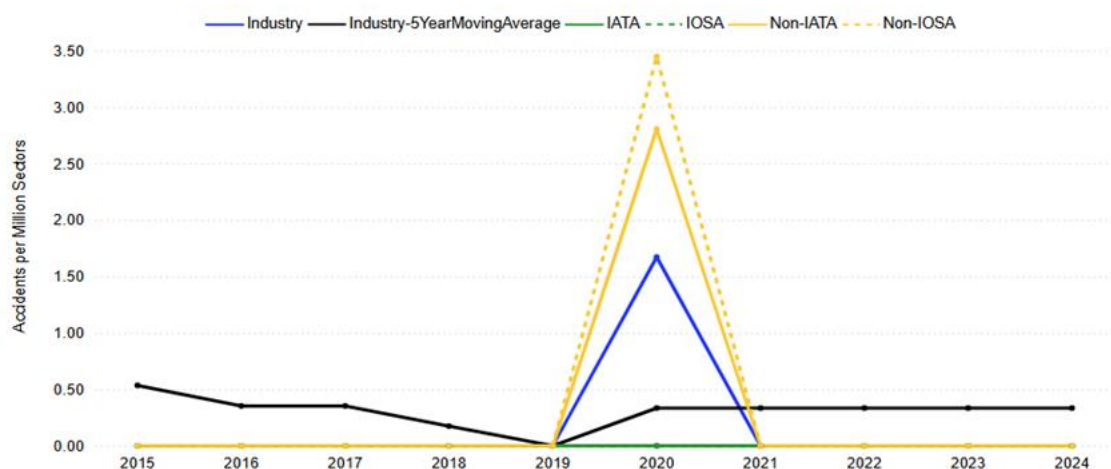
Accidents and Fatalities Onboard by Year * Data source IATA

Source: IATA Interactive Safety Report

Figure 8c: Controlled Flight Into Terrain (CFIT) Accidents (Jet & Turboprop, 2015 – 2024)

Accidents	Fatal Accidents	Fatalities Onboard	Other Fatalities	Jet	Turboprop	Passenger	Cargo	IATA	IOSA
1	1	4	0	0	1	0	1	0	0

Accident Rate (per Million Sectors) by Year * Data source IATA



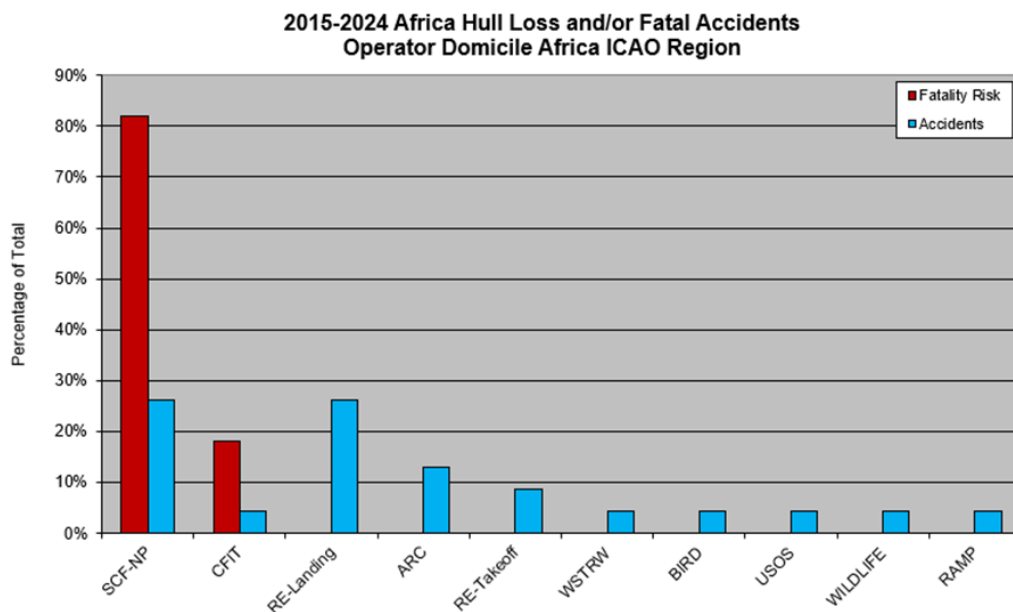
Accidents and Fatalities Onboard by Year * Data source IATA

Source: IATA Interactive Safety Report

2.1.12. The graph below, Figure 9, depicts the distribution of fatality risk and hull loss type accidents by CICTT accident category for the last 10 years, pertaining to operators resident in the AFI States.

2.1.13. System/Component Failure or Malfunction – Non-Powerplant (SCF-NP) and Controlled Flight Into Terrain (CFIT) are the leading accident types in fatality risk, while Runway Excursion on Landing (RE-Landing) is the leading cause for hull losses.

Figure 9: AFI Hull Loss and/or Fatality Risk for the period 2015 – 2024



*Western built airplanes, Part 121 equivalent operations: 23 accidents; 2.44 Full Loss Equivalents
 *Source: Boeing provided for CAST (Commercial Aviation Safety Team)

Key:

LOC-I: Loss of Control In-flight; **SCF-NP:** Systems/Component Failure or malfunction – Non-Power Plant; **CFIT:** Controlled Flight Into Terrain; **RE:** Runway Excursion; **ARC:** Abnormal Runway Contact; **USOS:** Undershoot/Overshoot.

Source: Boeing

2023-2024 AFI ATS Events

2.1.14. The AEAG/1 was jointly conducted by the ICAO WACAF and ESAF Regional Offices in coordination with the AFI RSOOs AAMAC, BAGASOO and CASSOA in application of the APIRG/27 & RASG-AFI/10 Conclusion 6/04. Eighty-five (85) participants including representatives from ESAF and WACAF States, ANSPs, RSOO and airspace users attended the Meeting.

2.1.15. The Meeting aimed at:

- ✓ Reviewing and validating the new methodology for ATS events analysis;
- ✓ Reviewing ATS events reported for 2023 and 2024 in the AFI airspaces and international aerodromes;
- ✓ Identifying safety trends and recurring issues;
- ✓ Formulating data-driven recommendations for the enhancement of ATS safety in the AFI Region;
- ✓ Reviewing and validating the governance framework of AEAG as well as the development of the 2026 roadmap;

2.1.16. A total of 455 ATS-related events were collected, including 321 occurrences in 2023 and 134 in 2024, as submitted by States and ANSPs through their respective RSOOs. The dataset covered incidents and contingencies that occurred both in controlled airspace and at aerodromes within ten (10) Flight Information Regions (FIRs), namely Antananarivo FIR,

Brazzaville FIR, Dakar FIR, Entebbe FIR, Harare FIR, Kano FIR, Kinshasa FIR, Lusaka FIR, Nairobi FIR and Niamey FIR.

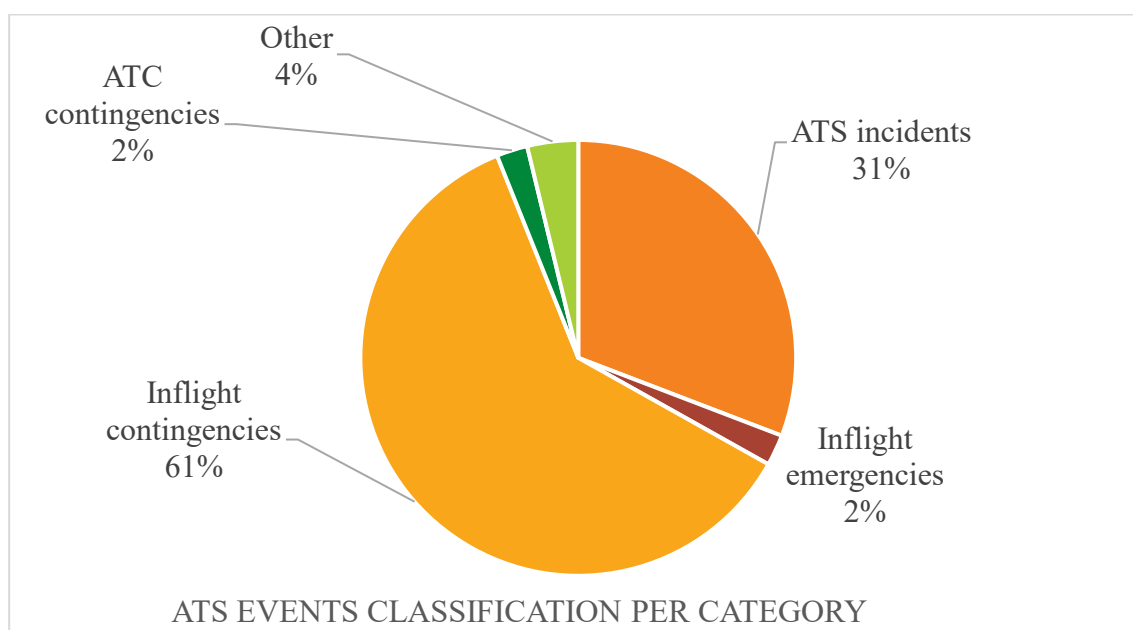
2.1.17. The most frequently reported occurrences in 2023 related to wildlife management, equipment reliability, communication performance, and ATC procedural adherence, with the following specific event types:

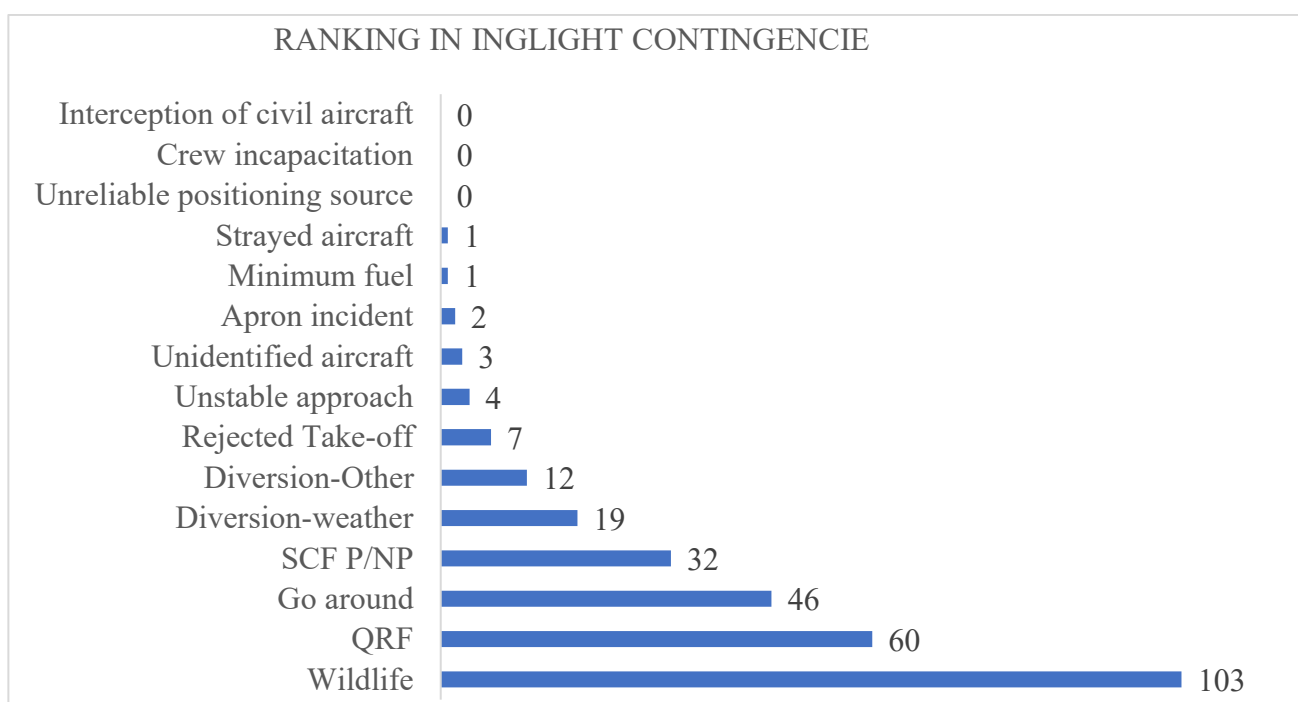
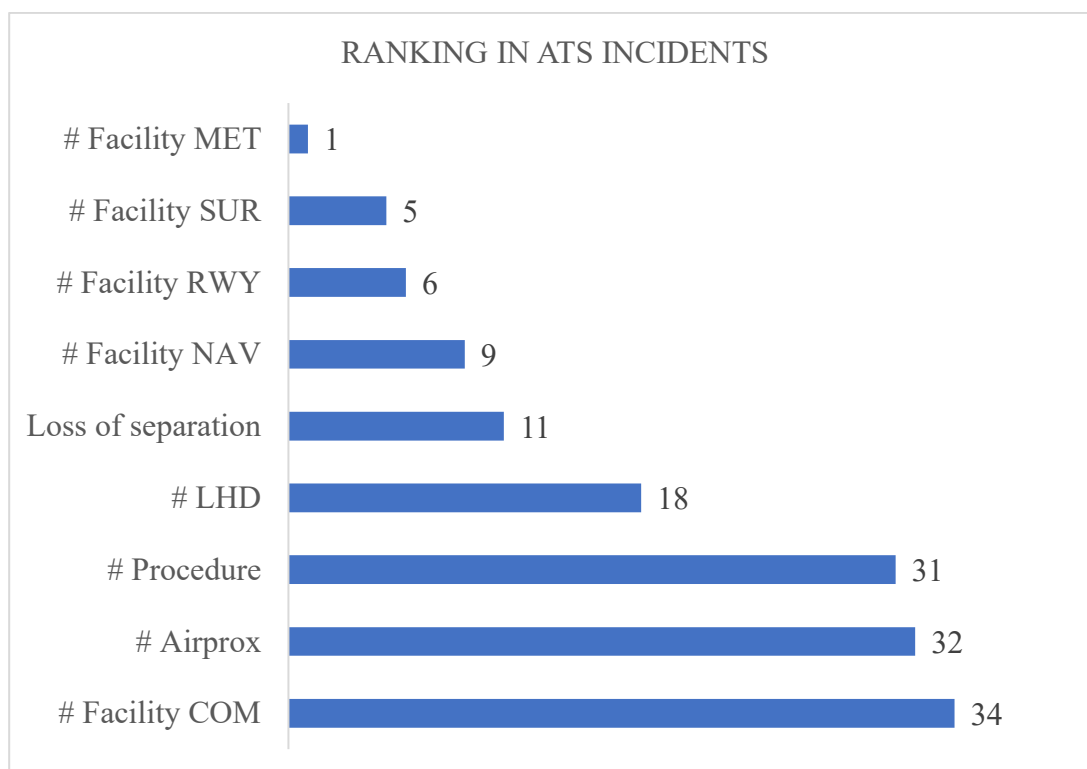
- Bird strikes (38 events) and Wildlife hazards (17 events) — together accounting for 17 percent of all 2023 reports;
- QRF-Onboard malfunctions (33 events) and Facility-COM issues (33 events) — reflecting the growing number of technical and communication reliability concerns;
- Go-around due to weather (17 events), AIRPROX (13 events), and Procedure-ATC issues (11 events);
- Loss of Separation (10 events) and Runway incursion (6 events) events.

2.1.18. In 2024, the reporting pattern changed noticeably. Although the overall volume of reports declined, the proportion of technical, aircraft, and system-related filings increased:

- Bird strikes (38 events), which remained the leading single event type, followed by
- QRF-Onboard malfunctions (17 events) and System/Component Failures (SCF-NP/SCF-P, 18 events combined),
- Procedure-ATC issues (6 events) and Runway excursions or incursions (4 events combined),
- Along with a notable presence of AIRPROX (8 events); Go-around due to weather (7 events) and unstable approaches (3 events), and Loss of Separation (2 events).

2.1.19. Overall, across both years, eight event categories accounted for over 75 percent of all filings: Bird strike, QRF-Onboard malfunction, AIRPROX, Loss of Separation, Facility-COM, Procedure-ATC issues, Go-around due to weather, and Wildlife hazard.





2.1.20. The consolidated analysis of all sub-groups identified the following **main causal categories** affecting ATS events in 2023–2024:

- ❖ **ATC human performance** – Loss of situational awareness, excessive workload, and procedural misapplication were recurrent in AIRPROX, Loss of Separation, and Runway Incursion cases. These events were also linked to inadequate coordination between FIRs or sectors, combined sector operations or insufficient use of available communication tools (HF/VHF/CPDLC).

- ❖ **Communication system deficiencies** – Reports indicated radio-frequency interference, limited range, power outages, and onboard transceiver malfunctions. In several FIRs, ground/air communication unserviceability and inter-ACC coordination issues contributed to loss of separation.
- ❖ **Procedural non-compliance and miscommunication** – ATC/pilot readback-hearback errors, incorrect clearances, and inconsistent application of local procedures were observed, particularly in aerodrome and terminal environments.
- ❖ **Wildlife hazards** – Frequent bird and animal presence near runways, coupled with ineffective or irregular control measures, remained a major factor in runway excursions and rejected take-offs.
- ❖ **Technical and equipment failures** – System/Component Failures (power and non-power) including unreliable navigation, surveillance outages, and onboard equipment failures, accounted for a significant share of inflight contingencies.
- ❖ **Weather and environmental conditions** – Thunderstorms, heavy rain, and wind shear continued to trigger go-arounds, unstable approaches, and turbulence encounters, occasionally compounded by inadequate low-level wind-shear alert systems.
- ❖ **Operational constraints and airspace design** – Dynamic traffic levels, lack of sectorization flexibility, and outdated Letters of Agreement were cited as structural contributors to several coordination-related events.
- ❖ **Data quality limitations** – Roughly one-fifth of the reports were incomplete or inconclusive, reflecting the absence of uniform investigation practices and limited implementation of just-culture reporting in some States.

Revised Abuja Safety Targets

- 2.1.21. The review and alignment of the Abuja Safety Targets were conducted through a series of technical consultations, including:
- Expert Working Group sessions;
 - A validation workshop held from 23 to 25 January 2024 at AFCAC Headquarters;
 - A Stakeholder Validation Workshop held virtually on 28 March 2024.
- 2.1.22. The Revised Abuja Safety Targets are now simpler, measurable, and aligned with the 6 ICAO GASP Goals and performance indicators outlined in regional plans such as the AFI-RASP (2023–2025 Edition), MID-RASP and EURONAT-RASP. The Revised Targets were presented and endorsed at the 35th AFCAC Plenary Session held from 26 to 27 November 2024; and adopted by Ministers during the 3rd Extraordinary Session of the AU STC-TIITE from 3 to 5 December 2024.
- 2.1.23. Next steps for 2025 will include developing a continental Action Plan and Monitoring Mechanism to support implementation and assess progress across Member States. Member States are expected to:
- Establish national Abuja Safety Targets Action Plans;
 - Periodically report implementation status and challenges to AFCAC;
 - Participate in data-sharing and capacity-building initiatives in coordination with AFCAC, RSOOs, ICAO and other partners.

2.2. PROACTIVE SAFETY INFORMATION

ICAO USOAP CMA Activities in the AFI Region in 2024

2.2.1. The ICAO Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA) activities conducted in the AFI region in 2024 showed considerable improvement in the overall EI scores in some States but setbacks in others, as depicted in **Table 2** below.

Table 2: ICAO USOAP CMA Activities conducted in AFI - 2024

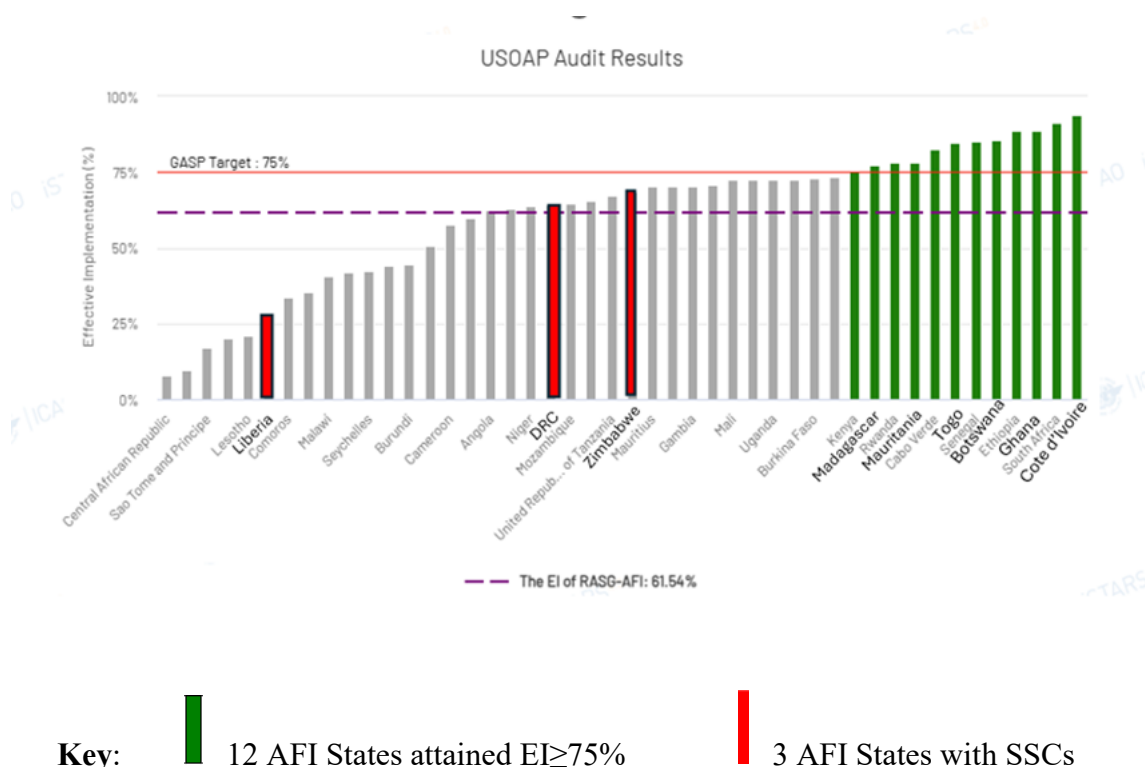
Eastern and Southern African (ESAF) Region			
Botswana	Audit	From 18 to 27 Jun 2024	%EI increased: 80,1% to 85,78%
Namibia	Audit	From 6 to 18 Mar 2024	%EI increased: 57,39% to 72,62%
Rwanda	OSVA-MIR	6 Aug 2024	%EI decreased: 79.29% to 77.95%
Zambia	Audit	From 21 Aug to 2 Sep 2024	%EI increased: 60,04% to 72,94%
Western and Central African (WACAF) Region			
Benin	Audit ^[1]	From 17 to 29 Jul 2024; and From 28 Aug to 6 Sep 2024	%EI increased: 60,71% to 62,91%
Côte d'Ivoire	ICVM	From 23 to 28 Oct 2024	%EI increased: 79,84% to 93,89%
Guinea	Audit	From 9 to 21 Oct 2024	%EI increased: 24,65% to 41,96% <i>Preliminary results</i>
Senegal	ICVM	From 17 to 24 Apr 2024	%EI increased: 63,26% to 84,89%

ICAO USOAP CMA Overall Results

2.2.2. The AFI Member States have achieved an overall Effective Implementation level of **61.54** per cent in 2024 (compared to 59.49 percent in 2023) for the 46 of 48 States audited between 2007 and 2024, which was below the world average EI score of 70.59% (the States of Somalia and South Sudan, are yet to receive USOAP-CMA activities). This corresponds to an increase of 2.05 percentage points on the level of Effective Implementation compared to 2023 (2.38 percentage point). **26 per cent** of the States in AFI (12 States) have achieved the target of 75 per cent Overall EI score by end of 2024, as suggested by the Regional Aviation Safety Plan (AFI-RASP) and the Global Aviation Safety Plan (GASP), Goal 2, Target 2.1. This showed an increment of 3.08 percentage points from the score in 2023 (i.e. from 22.92 percent in 2023 to 26 percent in 2024).

2.2.3. A Significant Safety Concern (SSC) indicates that a State is not providing sufficient safety oversight to ensure the effective implementation of applicable ICAO Standards. SSCs may be issued in personnel licensing (PEL), aircraft operations (OPS), airworthiness of aircraft (AIR), air navigation services (ANS), or aerodromes and ground aids (AGA), or. At the end of 2024, the SSCs identified in the area of Air Navigation Services (ANS), relating to non-calibration of Navigational Aids and non-validation of Instrument Flight Procedures, in the three States in AFI (Democratic Republic of Congo, Liberia and Zimbabwe) remained unresolved. The ICAO Regional Offices are working with the States to address these concerns.

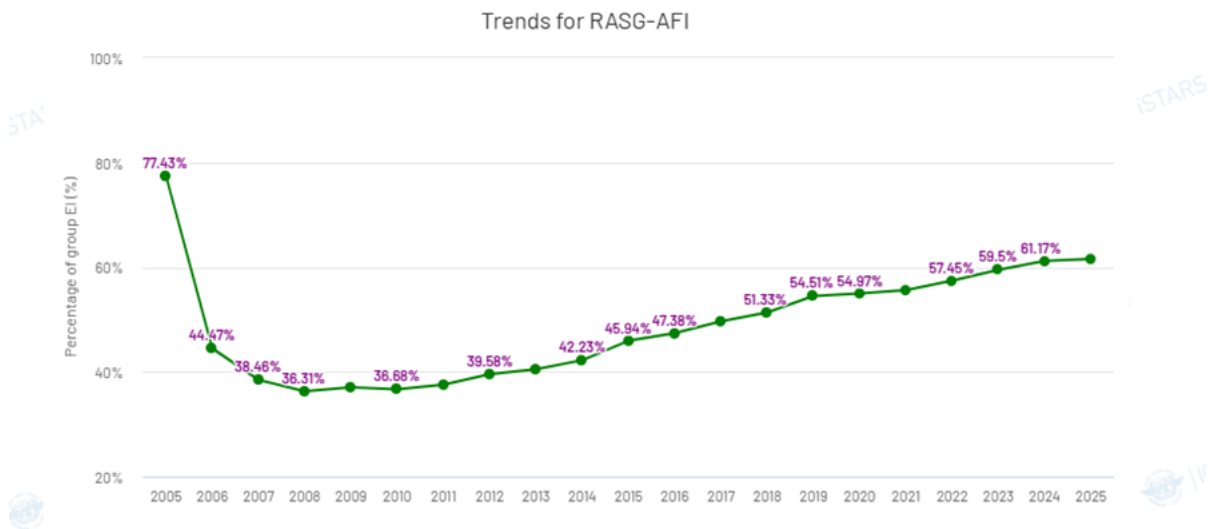
Figure 10: USOAP CMA Results of AFI States – EI at the end of 2024



Source: ICAO

iSTARS

Figure 11: USOAP CMA Results Trends for AFI States



Source: ICAO Istars

Table 3: Significant Safety Concerns (SSCs) in AFI in 2024

RASG-AFI has 3 States with a total of 5 SSCs.						
State	SSCs	SSC Areas				
		Airworthiness	Operations	Licensing	Aerodromes	Air Navigation
Democratic Republic of the Congo	2					✗
Liberia	2					✗
Zimbabwe	1					✗

Source: ICAO iSTARS

- 2.2.4. The USOAP-CMA results for the AFI States in 2024 did not indicate much change from those of 2023. That is, an EI score above 75 per cent in two audit areas: LEG and AIR (same as in 2023); and an EI score above 75 per cent in two Critical Elements (compared to one in 2023): CE-1 and CE-2. For the region, the audit areas with the low EI scores (less than 75%) were: ORG, PEL, OPS, AIG, ANS, AGA; and the Critical Elements with the low EI scores were: CE-3, CE-4, CE-5, CE-6, CE-7, CE-8, as shown in Figure 12 below.

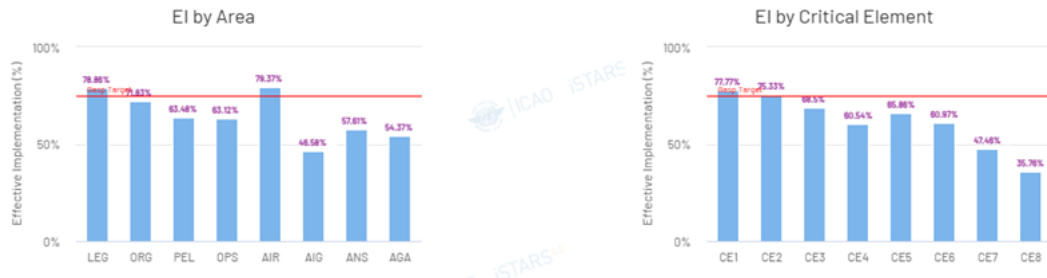
Figure 12: ICAO USOAP CMA Results by Audit Areas and Critical Elements

2 Audit Areas and 2 Critical Elements were above the target of 75% EI

USOAP Results by Area and Critical Element



2 areas and 2 critical elements are above the target of 75% EI.



Source: ICAO iSTARS

Figure 13: ICAO USOAP CMA Protocol Findings by Area and Critical Element Intersection (Heat Map)

RASG-AFI currently has 10,513 open USOAP protocol findings. The highest number of protocol findings (1,049) concern Licensing, Certification, Authorization and Approval Obligations (CE-6) in the area of Aerodromes (AGA).

	LEG	ORG	PEL	OPS	AIR	AIG	ANS	AGA
CE-1	87			18		132	25	23
CE-2	88		103	141	176	177	92	133
CE-3		94	60	102	52	234	196	75
CE-4		19	118	76	69	123	226	90
CE-5	29	7	96	188	159	901	22	163
CE-6			504	719	216		350	1,049
CE-7			203	256	107		983	665
CE-8			180	173	87	244	178	248

Protocol findings by Area and Critical Element Intersection

Source: ICAO iSTARS

Table 4: Overall safety performance dashboard**Performance Dashboard**

Indicator	Value
State Safety Oversight - Group EI <i>Group Satisfactory/(Group Satisfactory + Group Unsatisfactory)(%)</i>	61.54%
State Safety Oversight - State Levels <i>Percentage of States with USOAP Overall EI above 75%</i>	25%
Significant Safety Concerns (SSCs) <i>Number of SSCs</i>	5
Accident Rate <i>Number of accidents per mil. departures over preceding 5 years</i>	4.93
IOSA - Airlines <i>Number of IOSA certified airlines in the region</i>	31
IOSA - State Levels <i>Percentage of States with IOSA certified airlines</i>	43.75%
EU Safety List <i>Number of States with restrictions</i>	8
FAA IASA <i>Number of States rated as Category 2</i>	0
PBN Implementation - Runways <i>Percentage of instrument runways with PBN approaches</i>	92.63%
PBN Implementation - State Levels <i>Percentage of States having PBN approaches on all instrument runways</i>	80.85%

Source: ICAO iSTARS

Safety Partner Programmes

Collaborative Aviation Safety Improvement Programme (CASIP)

2.2.5. The Collaborative Aviation Safety Improvement Program (CASIP) was established in October 2023 as the pillar responsible for safety from the IATA FOCUS Africa Event. Including IATA, there are thirteen partners involved in the CASIP and these are namely ICAO, AFCAC, FAA, EASA, Airbus, Boeing, AASA, AFRAA, CANSO, IFALPA, FSF and WFP. The aim of CASIP is to bring together the expertise of global aviation specialists invested in working under a framework of trust, cooperation and collaboration to deliver safety improvement across the continent of Africa.

2.2.6. There are currently three (3) workstreams under CASIP as follows:

- Operational Safety Workstream
- Training, Capacity Building & Monitoring Workstream
- Safety Issue Review Meeting (SIRM Africa)

2.2.7. The main CASIP body oversees all three (3) streams while SIRM feeds into the first two streams back and forth. Currently there are about eight focus areas which have been identified under operational safety since its launch as follows:

- Runway Safety
- Aeronautical Information
- Communication Deficiency
- Safety Leadership & Safety Culture Development
- Loss of Separation
- Ground Damage to Aircraft
- Wildlife Hazard Management
- Rescue and Fire Fighting Services (RFFS)
- Operations in SSCs' Environment

2.2.8. Three SIRM sessions have been conducted so far, the first one in Nairobi in October, 2023, second in Dakar in April 2024 and the third in Kigali in December 2024. Outcomes and the calls to action from these sessions can be accessed at:

<https://www.iata.org/en/programs/safety/safety-risk/sirm/sirm-insights/topic/ground-ops/>

<https://www.iata.org/en/programs/safety/safety-risk/sirm/sirm-insights/audience/afi-sirm>

<https://www.iata.org/en/programs/safety/safety-risk/sirm/sirm-insights/audience/afi-srim-33/>

Link to CASIP can be found here: <https://www.iata.org/en/about/worldwide/ame/blog/casip/>

Championing Africa aviation safety together

2.2.9. The African Airlines Association (AFRAA) and Flight Safety Foundation (FSF) jointly organized the inaugural African Aviation Safety & Operations Summit on May 15, 2024, in Addis-Ababa, Ethiopia.

2.2.10. The one-day summit, themed "*Championing Africa Aviation Safety Together*," aimed to promote and improve safety standards within the African aviation sector. It brought together aviation stakeholders to discuss, strategize, and collaborate on shaping a safer future for African aviation. The summit addressed various aviation safety and operations facets, offering stakeholders a forum to discuss and exchange best practices.

2.2.11. The summit commenced with a snapshot of the region's aviation safety landscape and focused on the strides made, challenges addressed, and roadmap for sustaining and advancing safety in African skies. While the African aviation industry's safety performance has improved in recent years, more progress is needed to achieve global safety targets. Indeed, the absence of accidents does not necessarily mean the presence of safety.

2.2.12. Participants were presented with data on accidents and serious incidents highlighting high-risk categories in the region, prompting panellists to collectively explore and address underlying factors driving safety trends in African aviation. The ICAO Global and Regional High-Risk Categories remain a significant concern for Africa, especially regarding runway excursions, with **eight occurrences** reported since the start of 2024.

- 2.2.13. The summit focused on safety culture and organizational leadership, examining the role of leadership in fostering a robust safety culture within aviation organizations. This included promoting open reporting systems, learning from incidents, training, and encouraging continuous improvement. Participants expressed the importance of a safety culture in ensuring safe operations in any organization, emphasizing the need to prioritize safety as a core value throughout an organization, from leadership to frontline workers.
- 2.2.14. Throughout the one-day summit, participants exchanged numerous insights on the day's topics, issues, and challenges. They discussed how brainstorming could improve safety and bolster resilience in addressing ICAO Global and Regional high-risk areas.
- 2.2.15. Participants called for more collaboration and cooperation among stakeholders to effectively implement safety requirements and best practices, including *using technology and automation*, which are crucial for ensuring safety, efficiency, and growth in the aviation industry.
- 2.2.16. Some other predominant challenges highlighted were in the following areas:
- Air Navigation Infrastructure Safety & Airports Infrastructure safety
 - Capacity/Capability of Safety Oversight Bodies
 - Lack of Effective Safety Data Collection/Information Sharing, Data-Driven Safety Management to be used only for Safety enhancement, and
 - Investigation of all accidents and serious incidents not implemented.
- 2.2.17. The Inaugural Safety & Operations Summit ended up with a strong need for the establishment of priority actions: **Commitment on Safety**

Commitment on Safety

- 2.2.18. A strong commitment to safety is essential for creating a positive safety culture within the Organization. This commitment should be demonstrated at all levels of the organization, from top-level management to individual employees.
- 2.2.19. This involves actively participating in safety discussions, voicing concerns, and empowering colleagues to prioritize safety.
- 2.2.20. Individuals can demonstrate their commitment to safety by using the appropriate personal protective equipment, following safety procedures, and maintaining a vigilant attitude towards hazards.
- 2.2.21. Employers can further reinforce this commitment by establishing clear safety policies, providing regular training, and investing in safety-enhancing technology and resources

Operationalization of the existing initiatives – Runway Excursion (RE)

- 2.2.22. An assessment of the current situation is needed to effectively operationalize existing safety initiatives, like Runway Safety Teams.
- 2.2.23. Analyse the contributing factors to the increasing runway excursions and set measurable goals and key performance indicators (KPIs) to track progress on RE reduction.

- 2.2.24. Utilize robust methods for identifying new and existing risks, such as reviewing processes and procedures, redesigning workflows, and implementing educational measures.
- 2.2.25. Develop a framework for selecting and disseminating new safe practices, ensuring effective implementation and sustainability of improvement programs.

Establishment of collaborative safety enhancement groups

- 2.2.26. Establishing collaborative safety enhancement groups is a valuable strategy for safety improvement, as commercial competition must never prevent safety collaboration. These groups, bring together diverse stakeholders to collectively identify, prioritize, and monitor safety risks.
- 2.2.27. This collaborative approach allows for the sharing of safety information and the development of targeted safety enhancement initiatives that are tailored to specific needs.
- 2.2.28. As a matter of urgency, AFRAA is required to establish a Safety Group as part of its Technical, Operations, and Training Committee that will meet quarterly to exchange safety data and address identified trends.

More specific Training

- 2.2.29. Training in safety matters, awareness creation, and workshops [a Minimum of one per quarter on various safety topics] are essential.
- 2.2.30. Cultivate a robust foundation in management and leadership, focusing on the influence of cultural education. This involves reconciling differences between words and actions, treating blame as a systemic reaction, and comprehending the misconceptions surrounding safety management systems.
- 2.2.31. Provide Fatigue Management training for Pilots, Maintenance Engineers, Traffic Controllers, Ground Handling Agents, and others.
- 2.2.32. Provide training on recognizing typical human reactions, such as the startle effect, to improve reaction recognition.

Second African Aviation and Operations Summit Recommendations

Safety Culture and Leadership Commitment

- 2.2.33. To improve operational safety within aviation organizations, it is vital to promote leadership involvement with safety culture at all levels. Compliance with standard operating procedures (SOPs) must be maintained as a core value for safe operations. Creating non-punitive reporting systems is crucial for encouraging learning and ongoing improvement. Additionally, implementing awareness initiatives—such as workshops and customized safety culture programs in local languages and cultural settings—supports these efforts. Lastly, fostering collaboration and interaction between Regional Safety Oversight Organizations

(RSOOs) and industry stakeholders ensures comprehensive oversight and joint progress in safety standards.

Collaborative Safety Enhancement

- 2.2.34. To strengthen aviation safety initiatives, it is essential to hold regular meetings and promote greater collaboration within safety groups. Encouraging SMS peer reviews and facilitating knowledge sharing among airlines and stakeholders can further improve these efforts. Coordinating safety activities across different groups helps prevent redundant efforts and encourages synergy. Additionally, involving all relevant stakeholders—including cabin safety managers, ground handlers, and subject matter experts—in safety programs ensures a comprehensive approach to risk management.

Recommendations for Enhancing Runway Safety

- 2.2.35. Implement all GAPRI (Global Action Plan for the Prevention of Runway Incursions) recommendations across all stakeholders involved in runway operations.
- 2.2.36. Update procedures, improve infrastructure like signage, lighting, and markings, and strengthen communication among all parties to enhance runway safety.
- 2.2.37. Implement real-time crew alerting systems and situational awareness technologies to enhance safe and efficient runway operations.
- 2.2.38. Identify and manage risks related to aerodromes that support various aviation activities.
- 2.2.39. Focus on improving airport and runway design to reduce hazards and further boost safety.

Training, Human Factors & Fatigue Management

- 2.2.40. Enhance training programs to focus on key operational areas such as weight and balance, recognition and management of unstable approaches, proper execution of go-arounds, and effective identification of operational hazards. Incorporate evidence-based training methods, Team Resource Management (TRM), and comprehensive fatigue management strategies. Implement the EU 5-step Safety Risk Management model and the BIS framework to address fatigue and human factors within aviation operations systematically.

Regulatory Oversight and Capacity Building

- 2.2.41. To improve regulatory oversight and capacity building, it is vital to encourage active participation from civil aviation authorities (CAAs) to implement Abuja Safety Targets among all stakeholders. Efforts should involve all aviation professionals at the state level, not just operators and pilots, ensuring broad participation in safety initiatives. Additionally, strengthening capacity for accident investigation and safety oversight—especially in states that

need improvement—is essential. Rigorous license validation processes must also be enhanced to ensure the competence of foreign pilots.

Predictive Safety and Use of Data & Technology

- 2.2.42. The approach emphasizes using industry-wide, anonymized safety data to proactively identify risks and develop predictive safety systems that assist human decision-making. It promotes continuous feedback among crews, analysts, and safety teams, fostering a safety culture that prioritizes learning over blame and integrates early-warning mechanisms directly into operational workflows.

Infrastructure and Operational Resilience

- 2.2.43. Efforts to enhance infrastructure and operational resilience include closing identified gaps in runways and air navigation infrastructures, investing in equipment for disabled aircraft recovery, and acting on the AUC aircraft equipage gap analysis recommendations.

Wildlife Hazard Management

- 2.2.44. Efforts to manage wildlife hazards at airports include engaging local communities, running awareness campaigns to lower bird strike risks, hosting peer review meetings for collaboration, and investing in Bird Collision Avoidance Systems (BCAS) and other preventive technologies.

Regional Safety Initiatives

Comprehensive Regional Implementation Plan for Aviation Safety in Africa (AFI Plan) Activities 2024

The Regional Office Safety Teams (ROST) activities

- 2.2.45. The Regional Office Safety Teams (ROST) conducted activities aimed at assisting States in improving their safety oversight capabilities including the implementation of their USOAP Corrective Action Plans (CAPs). Assistance have been provided to 15 States (Benin, Botswana, Congo, Cote d'Ivoire, Gabon, Guinea, Liberia, Lesotho, Mauritius, Namibia, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone and Zambia). The increased assistance and engagement with States over the years resulted in a corresponding improvement in effective implementation (EI) of the critical elements of a State's safety oversight system in Africa. Accordingly, the EI increased for all the 7 States where USOAP CMA activities were conducted ((Benin (60.71% to 62.91%), Botswana (80.1% to 85.78%), Côte d'Ivoire (79.84% to 93.89%), Guinea (24,65% to 41,96%), Namibia (57.39% to 72.62%), Senegal (63.26% to 84.89%) and Zambia (60.04% to 72.94%).

Aerodrome certification project

2.2.46. In 2024, the following activities were conducted geared towards the achievement of the objectives of the aerodrome certification project:

- An Aerodrome Certification workshop for ESAF States was conducted by ICAO ESAF Office in Luanda, Angola, in February 2024;
- Aerodrome certification workshops were organized in Bangui, Central African Republic; N'Djamena, Chad and Malabo, Equatorial Guinea, from 5 to 9 August 2024 to engage aerodrome certification assistance activities;
- One airport was certified in the WACAF region: Cap Skirring, Senegal in April 2024;
- Two Airports were Certified in ESAF namely: Maun in Botswana and Augustino Neto Angola,.
- Assistance activities are ongoing for Conakry airport, Guinea; and Douala Airport, Cameroon, Kassiane in Botswana and King Mswati III in Eswatini.

2.2.47. The current percentage of certified aerodromes in the RASG-AFI region is 42 per cent (4% increase from 2023).

Runway Safety Teams (RSTs)

2.2.48. A Runway Safety Go-team activity took place in Maputo in Mozambique, and Manzini in Eswatini IATA and ICAO. The current percentage of established RSTs in the ESAF and WACAF regions is 33 percent.

Implementation of the new Global Reporting Format (GRF) for Runway Surface Condition

2.2.49. In 2024, GRF assistance activities including follow up on implementation plans were conducted with States that did not yet implement the GRF methodology

2.2.50. By December 2024, 46% of States in the WACAF region reported full implementation of the GRF while 40.3% of States in ESAF reported full implementation of GRF.

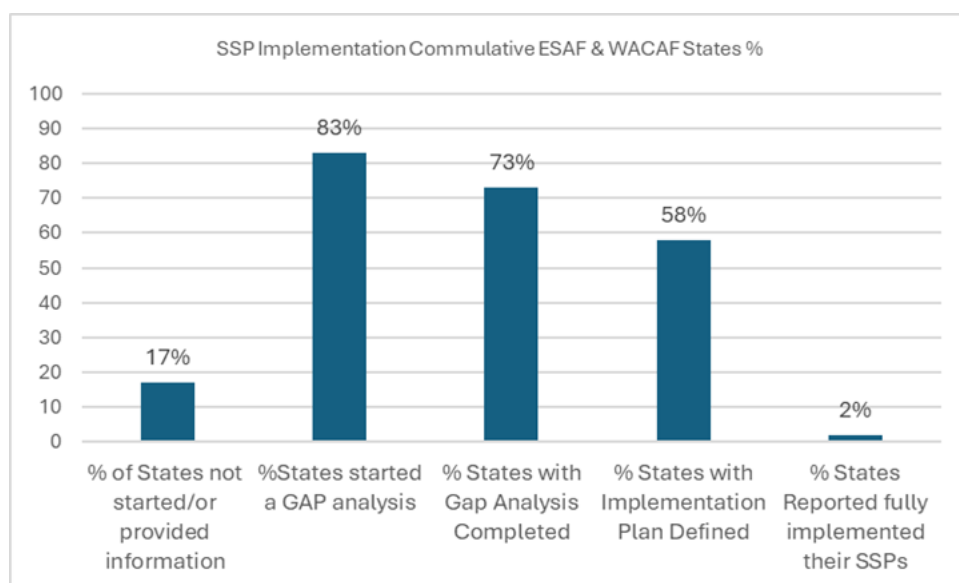
State Safety Programme (SSP) implementation project

2.2.51. The Global Aviation Safety Plan (GASP) and the AFI Regional Aviation Safety Plan (AFI-RASP) outline three key targets under Goal 3, which focuses on achieving effective implementation of State Safety Programmes (SSPs). Target 3.1 calls for all States to implement SSP Foundation Protocol Questions (FPQs) by 2023 (AFI-RASP by 2024); Target 3.2 calls for all States to publish their National Aviation Safety Plan by 2024, and Target 3.3 calls States to progress towards an effective SSP, reaching a level of maturity as "Present" by 2025 and "Present and effective" by 2028.

2.2.52. By the end of 2024, the overall implementation of SSP foundation Protocol Questions (FPQs) in the RASG-AFI Region was 69.22 per cent. Notably, twelve States have achieved over 85 per cent completion of the SSP Foundation PQs, indicating considerable progress.

2.2.53. For Target 3.2, only 29% (14) of States published their NASP in the NASP community, which is 29% (7) of ESAF and 29% (7) of WACAF States. Regarding Target 3.3, based on the information provided by States on the iSTARs SSP GAP-Analysis app, in 2024, over half of the States (58%) in the ESAF and WACAF regions have developed SSP implementation plans, indicating a strong commitment to progressing toward full implementation. As of 2024, 16.66% of States were at Level 0 (L0) – GAP analysis not yet started; 10.4% at Level 1 (L1) – GAP analysis started; 14.58% at Level 2 (L2) – GAP analysis completed; 56.25% at Level 3 (L3) – Implementation plan defined; and 2% at Level 4 (L4) – SSP fully implemented.

Figure 14: AFI States' Safety Programme Implementation (SSP) Progress.



2.2.54. To support States in the establishment and implementation of State Safety Programmes (SSPs) in the RASG-AFI Region, the WACAF and ESAF Regional Offices have continued to provide assistance. Under the AFI Plan and regular work programme, and in collaboration with regional and global aviation stakeholders, a number of technical assistance and capacity-building activities were carried out to support States' SSP implementation efforts.

2.2.55. Technical assistance on the State Safety Programme (SSP) was provided to Burundi, Botswana, Seychelles, Gabon, Togo, Ghana, Mauritania, Senegal, Cabo Verde focusing on the following key areas: conducting SSP Gap Analysis using the iSTARs tool; development of the SSP Implementation Plan, incorporating: Gaps identified through the gap analysis questionnaire, and Unresolved SSP Foundation Protocol Questions (PQs); formulation of Corrective Action Plans (CAPs) for unsatisfactory SSP Foundation PQs; review of SSP-Related Regulatory Requirements, including : an overview of the proposed amendments to Annex 19; risk-Based Surveillance methodologies; overview of the SSP Framework and its components; development and monitoring of the National Aviation Safety Plan (NASP) and

stakeholder management strategies; and utilization of the available ICAO Tools and Documents relevant to SSP implementation.

- 2.2.56. The Regional Offices conducted a virtual SSP Project Launch Meeting and Workshop from 16 to 17 January 2024 to introduce the revised AFI-Plan SSP Project and the generic SSP documentation developed by the group of experts. Additionally in collaboration with EASA, CAAS and the RSOOs, workshops were organized on State Safety Programme (SSP) Safety management systems and National safety plans.

African Air Navigation Service Providers (ANSPs) Peer Review Programme

- 2.2.57. The Peer Review Manual was ready and refresher training to conduct the peer review in collaboration with CANSO scheduled for 2025.

Aeronautical Information Management (AIM) Result Based Implementation Support (RBIS) for AFI States

- 2.2.58. Assistance in QMS implementation provided to Guinea, Liberia, Sierra Leone and Democratic Republic of Congo. The supported States were in the process of certification.
- 2.2.59. Assistance in AIXM-eAIP implementation provided to Benin, Guinea, Liberia, Sierra Leone and Democratic Republic of Congo. Guinea, Liberia, Sierra Leone were in the process of selecting a vendor.
- 2.2.60. Assistance in Terrain and Obstacle Data implementation provided to Guinea, Liberia, Sierra Leone, Democratic Republic of Congo, Mauritania, Cote d'Ivoire and Togo. Assisted States submitted action plan for the oversight.

AFI Regional Safety Oversight Organization (RSOO) Strategic Plan and Implementation Roadmap

- 2.2.61. A Validation Workshop on the follow-up to the Study for the Development and Implementation of a Strategic Plan for Supporting and Strengthening RSOOs/RAIO in the AFI Region was scheduled to be held in Kampala, Uganda, from 28 to 30 April 2025.

APIRG/27 and RASG-AFI/10 Meetings

- 2.2.62. The Twenty-seventh Meeting of the AFI Planning and Implementation Regional Group (APIRG/27) and the Tenth Meeting of the AFI Regional Aviation Safety Group (RASG-AFI/10) were held from 4 to 8 November 2024 at the Premier Hotel International Convention Centre, East London, Eastern Cape, South Africa.
- 2.2.63. Two APIRG/RASG-AFI joint sessions were convened on 4 and 8 November 2024; and the meetings of the two Groups were held back-to-back between the joint sessions. The meetings were attended by Two hundred-forty-two (242) participants from States, the ICAO

Headquarters and Regional Offices, international and regional Organizations, industry and other partners and stakeholders.

- 2.2.64. The Joint sessions of the APIRG/27 and RASG-AFI/10 meetings were co-chaired by Ms. Paule Assoumou-Koki, Director General of the Cameroon Civil Aviation Authority and Chairperson of the APIRG; and Mr. Fred Bamwesigye, Director General of the Uganda Civil Aviation Authority and Chairperson of the RASG-AFI, respectively.
- 2.2.65. Five (5) Conclusions and Six (6) Decisions were formulated by the joint sessions. Three (3) Conclusions and Two (2) Decisions were formulated by the RASG-AFI/10 Meeting.

Extraordinary Meeting of the APIRG and the RASG-AFI

- 2.2.66. The Extraordinary Meeting of the APIRG and the RASG-AFI was held on 19 July 2024 in Libreville, Gabon; and adopted Two (2) Decisions related to the enhancement of the APIRG and RASG structure.
- 2.2.67. The meeting reviewed the results presented by the Secretariat and endorsed the organizational structure of the merged Entity named the “Africa – Indian Ocean Aviation System Planning and Implementation Group (AASPG)”. The Secretariat had been requested, through the APIRG & RASG-AFI/EO - Decision EO/02, to circulate the draft Procedural Handbook of the AASPG to States and stakeholders, collect their additional contributions by 30 September 2024, and finalize it, for consideration by the next APIRG & RASG-AFI meeting.
- 2.2.68. The meeting reviewed the transitional arrangements from the current APIRG and RASG-AFI groups to the new AASPG and upon discussions, agreed on the following: the establishment of the new group AASPG replacing APIRG and RASGAFI to be submitted to the ICAO Council for consideration; key principles of transitional arrangements between the APIRG and RASG-AFI groups and the new AASPG. These arrangements would enable the APIRG and RASG-AFI, and their contributory bodies, to continue their activities until the operationalization of the AASPG.

Loss of Control In-flight (LOC-I) and Upset Prevention and Recovery Training (UPRT) Workshop.

- 2.2.69. The annual Loss of Control In-Flight (LOC-I) and Upset Prevention and Recovery Training (UPRT) Workshop, which was coordinated by the ESAF Regional Office, was held from 11 to 12 December 2024, in Addis Ababa, Ethiopia, alongside the celebrations of the 80th anniversary of the signature of the Chicago Convention. The event was conducted in the framework of the RASG-AFI agenda and RASG-AFI 5-year implementation plan for LOC-I.
- 2.2.70. The Workshop was attended by more than 180 participants and sessions included:
- UPRT: Theory and Standards (ICAO, FAA, EASA)
 - LOC- I and Threat and Error management
 - CASSOA LOC-I and UPRT Advisory Circular
 - UPRT for airlines in Türkiye and associated Safety Oversight System
 - UPRT Instructors
 - Airplanes for On-Airplane Training
 - IDT Perspective
 - LOC-I 5-year Plan, Survey and Online Reporting and Monitoring Tool
 - Tool for Safety Oversight System

- Simulators UPRT Training – Preparation / Execution and techniques and demonstrations.

2.2.71. The Workshop imparted to participants relevant knowledge and best practices that are key enablers for the implementation of the RASG-AFI 5-year LOC-I Plan.

2.2.72. The Workshop contributed to the consolidation of the safety enhancement initiatives for NASPs and AFI-RASP as per the ICAO GASP

2.2.73. As a way forward, States and industry are recommended to:

- expedite the efforts to implement the 5-year LOC-I Plan of Action with the support of the AASPG Champion State and ICAO.
- make use of the AASPG Model guidance material and CASSOA Advisory Circular to implement necessary processes
- complete the survey on LOC-I for reporting on progress made so far.
- develop competency-based training for UPRT.

2.2.74. ICAO Regional Offices, on their side, will:

- continue to provide guidance to Kenya as AFI Champion State on LOC-I and UPRT issues
- monitor the updating and implementation of the related AFI 5-year Plan of Action.
- continue to provide guidance and support for the development and operationalization of the Online Reporting and Monitoring Tool
- provide feedback on the survey and the progress made by States

2.2.75. The Workshop documentation is available at: <https://www.icao.int/ESAF/Pages/loc-i-and-uprt-2024.aspx>

Controlled Flight Into Terrain (CFIT) Workshop

2.2.76. The CFIT Workshop is one of the RASG-AFI annual events intended to review the status of implementation of the Safety Enhancement Initiatives (SEIs) identified for the region to avoid/mitigate CFIT related risks, among others.

2.2.77. The event was held at the Cameroon Civil Aviation Authority Training School, in Yaounde, Cameroon, from 7 to 9 October 2024. The workshop was supported by resource persons from the WACAF Regional Office and IATA. The workshop was attended by **20** participants from ESAF and WACAF States, air operators and other aviation stakeholders.

2.2.78. The following presentations were delivered at the workshop:

- ICAO regulatory provisions on CFIT, and the identified Safety Enhancement Initiatives (SEIs) to mitigate risks related to CFIT;
- CFIT Detailed Implementation Plan and related accident analyses;
- Performance-Based Navigation (PBN): Regulatory approval process, its impact on safety and prevention of CFIT-related occurrences; and
- Air operator certification process as it relates to mitigation of risks associated with CFIT occurrences.

2.2.79. The Workshop also reviewed the status of implementation of the eight Safety Enhancement Initiatives (SEIs) identified in the regional aviation safety plan to mitigate CFIT-related risks (GPWS; SOPs, CDFA, FDA, CRM/TEM, ALAR, MSAW, PBN). The AFI region has registered **3.59%** improvement rate in the implementation of the related PQs (i.e. from 69.36% in 2023 to 72.95% in 2024). The workshop recognized this improvement and encouraged States and stakeholders to continue prioritizing the implementation of the Safety Enhancement Initiatives (SEIs).

2.2.80. The Workshop documentation is available at:
<https://www.icao.int/WACAF/Pages/Workshop-CFIT-2024.aspx>

Regional Aviation Safety Plan for Africa-Indian Ocean (AFI-RASP 2023-2025 Edition)/National Aviation Safety Plan (NASP) Workshop

2.2.81. Two Regional Aviation Safety Plan (AFI-RASP 2023-2025 Edition)/National Aviation Safety Plan (NASP) Workshops were held in Nairobi, Kenya, and Banjul, The Gambia, in September 2024, as called by the RASG-AFI/9 – Conclusion 9/05, to familiarize States and stakeholders with the Regional Aviation Safety Plan and support States in developing their National Aviation Safety Plans (NASPs).

2.2.82. Two workshops were attended by over 80 participants from States, industry, Regional and International Organizations. The workshops delved into the different parts of the AFI-RASP, goals, targets, operational Safety risks, organizational challenges, and the regional High-Risk Categories of occurrences (R-HRCs). They also provided an overview of the Global Aviation Safety Plan.

2.2.83. To better equip participants for the development of a national aviation safety plan, breakout groups were formed and facilitated exercise assigned to groups on the following:

- *Development of a list of prioritized national safety issues;*
- *Setting national goals, targets and indicators;*
- *Development of a list of prioritized SEIs; and*
- *Definition of safety performance measurement.*

2.2.84. Most States expressed their appreciation of the workshop and advocated for its annual conduct. After the workshops in 2024, four States (Botswana, Chad, Senegal and Tanzania) were able to develop, publish and register their NASPs with the ICAO NASP Online Community; and One State (Cabo Verde) was able to revise its NASP in alignment with the AFI-RASP 2023-2025 Edition. Several other States are at different stages of the development/revision of their NASPs, with the support from the Regional Offices.

2.2.85. As at 31 December 2024, Seven WACAF States (Benin, Cabo Verde, Cote d'Ivoire, Ghana, Senegal, Sierra Leone, Togo) and Seven ESAF States (Botswana, Ethiopia, Kenya, Namibia, Rwanda, Tanzania, Uganda) had developed their NASPs and registered them with the ICAO NASP Online Community.

Performance Based Navigation (PBN) Operations Approval

- 2.2.86. Through the African Flight Procedure Programme (AFPP), African States continue to receive technical assistance in the implementation of PBN flight procedures at both international and domestic airports. This includes support to Civil Aviation Authorities in understanding and applying PBN concepts and products, enhancing oversight capabilities, ensuring quality assurance, and managing both regulatory and operational approvals in accordance with ICAO's PANS-OPS provisions.
- 2.2.87. This initiative is designed to significantly reduce the risk of Controlled Flight Into Terrain (CFIT) accidents and serious incidents, enhance operational efficiency, increase airport accessibility, and contribute to environmental sustainability by reducing CO₂ emissions from aviation operations.
- 2.2.88. However, challenges persist in several States. In some cases, the critical importance of instrument flight procedures in ensuring safe operations remains underappreciated. Key deficiencies include:
- Absence or underdevelopment of PANS-OPS oversight entities,
 - Inadequate calibration of navigational aids as per ICAO standards,
 - PBN procedures not being properly flight validated or approved by the designated authorities.
- 2.2.89. To address these gaps, a series of awareness and capacity-building initiatives were recommended during the APIRG/27 Meeting, aiming to establish more robust and effective oversight systems.
- 2.2.90. AFPP Key Results in the AFI Region (As of December 2024) The implementation of activities under the AFPP yielded the following results across the AFI Region:
- RNP Approach (LNAV only): Implemented at 84.1% of applicable locations
 - RNP Approach (with baro-VNAV): Implemented at 61.6%
 - National PBN Implementation Plans (NPIPs): Developed in 83.3% of African States
 - Capacity Building: Eight (8) training sessions/workshops held, benefiting 223 participants from 30 States and organizations

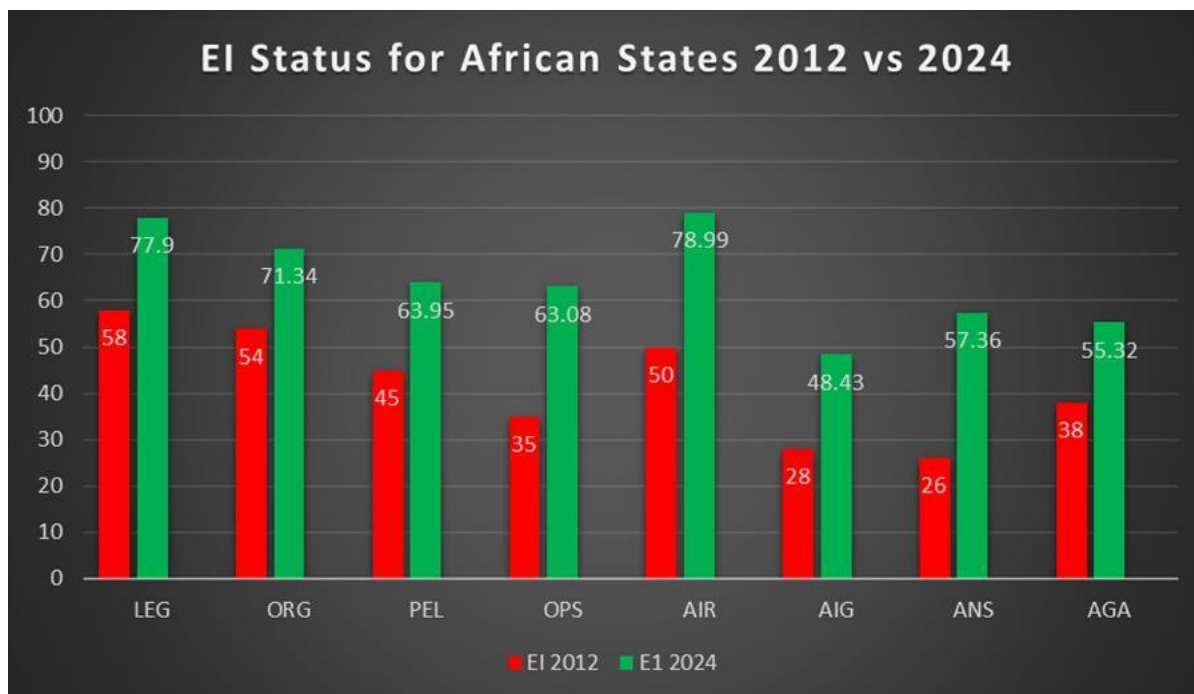
The Cooperative Inspectorate Scheme for Africa (AFI-CIS)

AFI CIS - 2024 Performance

- 2.2.91. From January to December 2024, AFCAC facilitated 11 AFI-CIS missions across 8 States. These missions were structured using a project-based approach, with each guided by High-Level Action Plans. Positive outcomes included increased EI scores in Senegal, Namibia, Zambia and Zimbabwe.
- 2.2.92. Together with other initiatives such as the AFI Plan and RSOOs assistance programs, the AFI CIS contributes to:
- the resolution of SSCs;
 - development and implementation of Corrective Action Plans (CAPs) following USOAP CMA Audits; and Performance by Audit Area

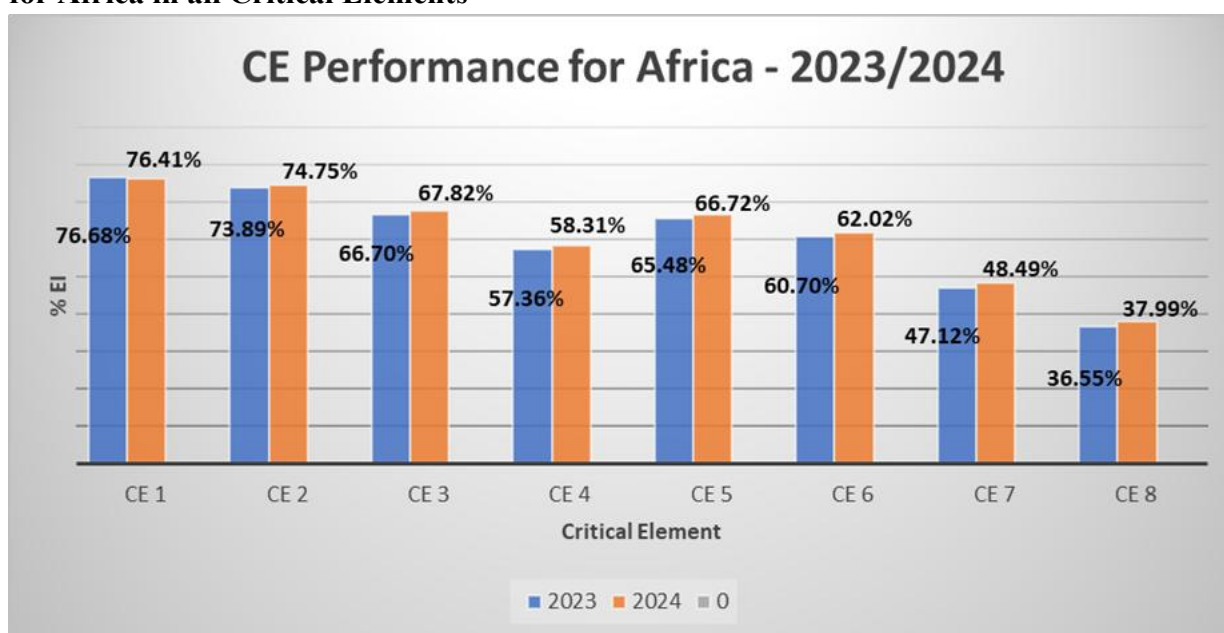
2.2.93. EI in Africa was at 61.79% as of December 2024. The graph below summarizes the general increase of EI status in all audit areas for Africa since 2012:

Figure 15: EI Status for African States 2012 vs 2024.



Source: ICAO ISTARS.

Figure 16: Performance by Critical Element: Comparison between 2023 and 2024 EI status for Africa in all Critical Elements -



2.2.94. Performance in CE1 (Primary Aviation Legislation) and CE2 (Specific Operating Regulations) slightly declined, indicating a need for renewed focus on regulatory frameworks. The lowest scores remain in CE7 (Surveillance Obligations) and CE8 (Resolution of Safety Concerns), though slight progress in 2025 suggests growing momentum toward strengthening State oversight capabilities. Targeted capacity-building efforts and increased technical support in these areas will be critical to sustaining and accelerating improvement.

Table 5: Technical Assistance Missions and Outcomes:

2.2.95. Following the adoption of the project approach to technical assistance missions, AFCAC planned and executed a significant number of technical assistance missions for the period January to December 2024. Availability of funds and CIS inspector resources, made it possible for AFCAC to facilitate a total of 11 AFI CIS technical assistance missions for 8 States.

State	Mission Objective(s)	Missions conducted 2024	Mission Output
Eswatini	Assist State to develop legislation, specific operating regulations, procedures and technical guidance material for certification, licensing, and surveillance.	12-16 April 2024 (1 mission)	Amendment text for the specific operating regulations; Promulgated AGA regulations; Updated Human Resources Manual: - organizational structure; - inspector training program; - inspector recruitment and retention policy Amendment text to the Rulemaking Process. Revised AGA organogram in line with ICAO Doc 9774 guidance; and draft Airworthiness Surveillance Manual under development.
Central African Republic	Assist State to develop legislation procedures and technical guidance material for certification, licensing, and surveillance.	Apr-10 May 2024 (1 mission)	Finalized the draft amendment to Order No. 125/2007/MTAC. DIRCAB/DGACM; drafted amendment text to regulations; established minimum qualification requirements for examiners who prepare questions or evaluate exams; procedure showing methods to ensure the control and distribution of technical documents necessary for inspection and other technical licensing personnel; and mechanism allowing OPS inspectors to have greater access to operational information from manufacturers aircraft (MMEL, TCDS, AFM, etc.)
Zimbabwe	Assist State to prepare for the ICAO audit and to resolve SSC	11-15 Mar 2024 8-12 Jul 2024 (2 missions)	finalized technical guidance material in all audit areas except AIG; Inspectors' handbooks in all domains except AIG; SSC resolution and support; and

			validation of flight procedures calibration to remove SSC.
Burundi	Assist State according to specific requests on ANS, AGA and AIR	12 -23 Feb 2024 (1 mission)	Amendment text to: - Legislation, - specific operating regulations – all audit areas, - Inspectors’ handbooks for ANS, AGA and AIR audit areas; - the personnel qualification and training program for ANS, AGA and AIR audit areas.
Benin	Assist State to prepare for the ICAO audit	5-16 Feb 2024 20-31 May 2024 (2 missions)	Amendment text to: - Législation: - specific operating regulations in all audit areas; - Inspectors’ handbooks for all audit areas; Completed checklists and reports after surveillance of airlines in Benin – OPS only.
Namibia	Support in undertaking Phase 4 certification of the Air Navigation Services Provider and preparation for USOAP CMA Audit.	15-26 Jan 2024 20 Jan – 10 Feb 2024 (2 missions)	Phase 4 of the ANSP Certification in the following service delivery areas: Air Traffic Services (ATS); Aeronautical Information Services (AIS)/ Aeronautical Information Management (AIM) ; Communication, Navigation and Surveillance (CNS) ; Procedures for Air Navigation Services- Aircraft Operations (PANS-OPS); Search & Rescue Services (SAR); and Aeronautical Cartography
Senegal	Support the State in Aircraft Accident and Incident Investigation though it was not covered during the recent ICVM.	March 2024 (1 mission)	Provided expert advice from CE1 to CE8 for AIG.
Sierra Leone	Assist State to conduct an AOC Certification project	9 – 13 Dec 2024 (1 mission)	Conducted Phase 1, Phase 2 and Phase 3 certification of the prospective airline operator

Source: AFCAC Annual Report 2024.

Table 6: AFI CIS Technical Assistance Missions 2024 - Key Challenges

2.2.96. AFI CIS technical assistance missions provide insights into key issues affecting Member States as they progress towards improvement of their safety oversight systems. Top 5 issues affecting Member States include the following –

Audit Area	Critical Element	Identified Weaknesses	Recommended Interventions
ALL	ALL	Lack of capacity to establish and implement SSP/SMS requirements	Resources for Capacity Building towards SSP/ SMS Implementation
ALL	CE - 4	Insufficient training including OJT	Commit sufficient financial resources for inspector training, including OJT
Air Navigation Services	CE6 to CE 8	Lack of resources to conduct Instrument Flight Procedures (IFP) design and validation	Commit sufficient resources to conduct capacity building for IFP design, validation, and implementation (CE 6 – CE 8)
Aircraft Accident Investigations (AAI)	ALL	Establishment and implementation of an independent Aircraft Accident Investigations Organization (AAIO)	Establishment and Implementation of independent AAI.
ALL	CE 6 to CE 8	Uncoordinated safety oversight functions resulting in inconsistent implementation of CE 6 to CE 8.	Identify suitable IT tools and Integrate Safety Oversight Systems, particularly CE 6 to CE 8

Source: AFCAC Annual Report

2024

Conclusion

2.2.97. As at December 2024, Africa's average Effective Implementation (EI) stood at 61.79%, remaining below the global target of 75%. The AFI-CIS Programme continues to serve as a critical mechanism in supporting States to strengthen their safety oversight capabilities and close this gap. The expansion of its scope and the enhancement of training modules have provided a robust foundation for further progress.

2.2.98. To ensure sustained improvement, it is essential that more Member States formalize their engagement through the signing of Memoranda of Understanding (MoUs), and that long-term, predictable funding mechanisms are secured. Member States are strongly encouraged to take full advantage of the technical support and capacity-building opportunities offered under the AFI-CIS Program to enhance their oversight systems and increase their EI scores in alignment with global benchmarks.

IATA Operational Safety Audit (IOSA)

2.2.99. The IATA Operational Safety Audit (IOSA) is the benchmark for global safety management in airlines and is an internationally recognized and accepted evaluation system designed to assess the operational management and control systems of an airline. IOSA scope covers eight (8) areas, which include: Organization and Management (ORG), Maintenance (MNT), Cargo (CGO), Security (SEC), Flight Operations (FLT), Dispatch (DSP), Cabin Safety (CAB) and Ground Handling Operations (GRH).

2.2.100. The IATA Operational Safety Audit (IOSA) is a global industry standard for airline operational safety auditing. For two decades, IOSA has become the industry benchmark in safety auditing, contributing to improving safety performance and providing extensive cost-saving measures for IOSA participating airlines. The program is a condition for IATA membership.

2.2.101. To keep up with today's dynamic environment, the IOSA Program has shifted to a risk-based approach. Focusing on pertinent safety risks, while maintaining a baseline of safety, the current IOSA Program increases the effectiveness of the audit and contributes to the overall industry goal of reducing the accident rate.

2.2.102. Additionally, IATA continually develops the IOSA Standards and Recommended Practices (ISARPs), in cooperation with industry partners.

Features of the Risk-Based Approach

2.2.103. Audit scoping is based on a combination of industry standards and operator-specific elements such as operational profile, safety events, and the operator's IOSA audit history. The below example illustrates how different factors will be considered in the audit scoping and how this practice differs from today's process.

Table 7: Example of audit scoping under a risk-based approach to IOSA

Audit Scoping	Previously	Today - Risk-based approach
Worldwide runway excursion rate has been increasing	All ISARPs are audited regardless of their universal criticality	ISARPs are prioritized in regular intervals. In this example ISARPs related to runway excursions are identified as high

		priority and audited in-depth
An operator has been demonstrating conformity with a non-critical ISARP for several consecutive audits	All ISARPs are audited regardless of their criticality for the operator	The scope is tailored to the Operator's operating profile and audit history. ISARPs with low criticality may be audited at lower frequency to allow focus on high-criticality ISARP

Maturity Assessment

2.2.104. The maturity assessment introduces a more structured and comprehensive way of providing the airline with an evaluation of its relevant safety systems and programs. This further assists in determining the next steps in improving its operational safety.

2.2.105. In addition to the introduction of the maturity assessment, Risk-based IOSA continues to require a baseline of conformity with IOSA Standards and Recommended Practices (ISARPs). The example below shows the difference between the conventional conformity assessment and the maturity assessment that has been introduced.

Table 8: Example of maturity assessment under a risk-based approach to IOSA

Maturity assessment	Previously	Today - Risk-based approach
FLT 2.2.14 "The Operator shall ensure flight crew members complete Operator familiarization training prior..."	Assessment Method (on each ISARP) Conformity ☒ Nonconformity ☐	Assessment Method (on selected ISARPs and Programs) 

Source: IOSA Program Office

IATA Safety Audit for Ground Operations (ISAGO)

2.2.106. IATA Safety Audit for Ground Operations (ISAGO) is the industry program for the global oversight of ground handling service providers (GHSPs). There are 226 GHSPs in the ISAGO Registry providing services at 401 accredited stations at 239 airports worldwide. As of 31st Dec 2024, 267 audits were completed, and 370 audits are expected in the year 2025. Currently, 169 airlines (145 in FEB 24) have access to the ISAGO audit reports repository, which contains over 500 reports. Asia is the fastest-growing region, with 15 new airline members. ISAGO Airlines utilize these audit reports to enhance their risk-based oversight programs for outsourced ground operations services. Data collected from 29 ISAGO airline groups (out of 71 ISAGO airline groups) show how the airlines benefit from the access to the ISAGO reports and what actions they take: ▪ Cancelled their own audit for 545 stations (446 in JUN24) ▪ Reduced oversight cost for 218 stations (110 in JUN24) ▪ Reduced training cost at 170 stations (118 in JUN24) ▪ Reduced # of auditor-days for 350 stations (335 in JUN24) ▪ Used ISAGO reports during their procurement process for 359 stations (271 in JUN24) ▪ Used data from the reports to complement their own SMS for 541 stations (396 in JUN24) ISAGO audit model is being revamped to meet the industry requests for enhancements, driving even more standardization, adoption of industry requirements for ground operations, and safety risk reduction. Read more about the changes at www.iata.org/isago

Source: IATA Annual Safety Report

2.3. PREDICTIVE SAFETY INFORMATION

Status of Implementation of State Safety Programmes (SSPs)

- 2.3.1. The GASP and AFI–RASP outline three targets within Goal 3 aimed at achieving effective State Safety Programmes (SSPs). Target 3.1 mandates States to implement SSP Foundation Protocol Questions (FPQs) by 2023; Target 3.2 requires States to publish their National Aviation Safety Plan by 2024, and Target 3.3 expects States to progress towards an effective SSP, reaching a level of maturity as "Present" by 2025 and "Present and effective" by 2028.
- 2.3.2. The ICAO ESAF and WACAF Regional Offices provided technical assistance to Botswana, Burundi, Cabo Verde, Djibouti, Eswatini, Ethiopia, Gabon, Ghana, Malawi, Mauritania, Mozambique, Madagascar, Mauritius, Seychelles, Togo, Senegal and Zimbabwe under the AFI Plan SSP project and regular programme, to support the States' efforts in the establishment and implementation of their State Safety Programmes (SSP).
- 2.3.3. The overall level of SSP implementation in the WACAF Region in 2024 was 66.85% with 9.1% CAP completed. With regards to SSP implementation, the information reported by WACAF States in the iSTARS, indicated that 16.67% of States did not provide any report, 8.33% of States were at L1 (Started the GAP Analysis), 8.33% of States were at L2 (GAP-Analysis completed) and 66.67 % of States were at L3 (Implementation Plan defined).
- 2.3.4. The overall level of SSP foundation PQ in the ESAF Region was 69.9% with 14.1% of CAPs completed. With regards to SSP implementation, the information reported by ESAF States in the iSTARS and Regional Office data indicate that 12.5% of States did not provide any report, 4.1% of States were at **Level 1** (Started the GAP Analysis), 16.67% of States were at **Level 2** (GAP-Analysis completed) and 62.5 % of States were at **Level 3** (Implementation Plan defined) and 4.17% were at **Level 4** (completed SSP implementation).
- 2.3.5. According to the information reported by ESAF and WACAF States in the iSTARS and Regional Office data, the overall weighted average of State Safety Programme (SSP) Implementation was 58.5% and 56.3%, respectively.
- 2.3.6. Two training on SSP were conducted in Nairobi by ICAO using HRDF fund and in collaboration with Boeing.
- 2.3.7. In coordination with CAAS and EASA, five workshops were organised focusing on Safety Management Implementation, the State Safety Programme (in both English and French), and the National Aviation Safety Plan (NASP).

3. CONCLUSIONS AND RECOMMENDATIONS PART 1

3.1. CONCLUSION

3.1.1. Based on the analyses of the available data for 2024, the following conclusions are drawn:

A. Achievements registered:

3.1.2. Twelve States out of the 46 audited States have attained 75% EI or greater in 2024, compared to 11 in 2023.

3.1.3. The AFI Region had attained an overall Effective Implementation (EI) level of **61.54%** in 2024, compared to 59.49 percent in 2023. However, this was still below the world average of 70.59% EI.

3.1.4. Seven WACAF States (Benin, Cabo Verde, Cote d'Ivoire, Ghana, Senegal, Sierra Leone, Togo) and Seven ESAF States (Botswana, Ethiopia, Kenya, Namibia, Rwanda, Tanzania, Uganda) had developed their NASPs and registered them with the ICAO NASP Online Community.

B. Challenges encountered:

3.1.5. The five existing SSCs identified in three States (Democratic Republic of Congo (2), Liberia (2), Zimbabwe (1)) in the area of ANS, relating to non-calibration of Navigational Aids and non-validation of Instrument Flight Procedures were unresolved.

3.1.6. Runway Excursion (RE) remained the most predominant High Risk Category of Occurrence and continues to be one of the main priorities for Safety Enhancement Initiatives (SEI) in the AFI Region;

3.1.7. The pace of SSP implementation remains slow, with only one State having reported full implementation of SSP (Rwanda).

3.2. RECOMMENDATIONS:

3.2.1. ICAO should continue pursuing high-level intervention in the States identified with SSCs in a bid to sensitise the appropriate State authorities on the importance of resolving the SSCs and recognising aviation amongst the priorities of the States. The ICAO Regional Offices should continue providing necessary support to the States to resolve the SSCs, in addition to addressing the safety deficiencies identified by the USOAP CMA activities.

- 3.2.2. The Safety Management and Oversight Sub-Group (SMO/SG) of the AFI Aviation System Planning and implementation Group (AASPG) should pursue the revision of the AFI-RASP 2023-2025 Edition for alignment with the GASP 2026-2028 Edition, by June 2026.
- 3.2.3. States should prioritize the development of their National Aviation Safety Plans (NASPs), to be aligned with the GASP 2026-2028 Edition. States that have already published their NASPs should revise them for alignment with the GASP 2026-2028 Edition; and implement them accordingly.

APPENDICES

Appendix – 1: List of Permanent Partners of AFI

Airports Council International (ACI)

African Civil Aviation Commission (AFCAC)

African Airlines Association (AFRAA)

Airbus Aircraft Manufacturer (AIRBUS)

Agence pour la Sécurité de la Navigation Aérienne en Afrique et à Madagascar (ASECNA)

Boeing Commercial Airplane Company (BOEING)

Civil Air Navigation Services Organization (CANSO)

Cooperative Development of Operational Safety and Continuing Airworthiness Programmes (COSCAPs)

European Aviation Safety Agency (EASA)

Federal Aviation Administration – United States of America (FAA-USA)

Flight Safety Foundation (FSF)

International Air Transport Association (IATA)

International Federation of Airline Pilots Association (IFALPA)

International Federation of Air Traffic Controllers Association (IFATCA)

Regional Safety Oversight Organizations (RSOOs)

Regional Aircraft Accident and Incident Investigation Organizations (RAIOs)

World Food Programme - United Nations (WFP-UN)

Appendix – 2: List of Twelve (12) AFI States that had an Effective Implementation (EI) of the Critical Elements of a State’s Safety Oversight System of 75% and greater under the ICAO USOAP CMA by 31 December 2024.

Cote d’Ivoire (**93.89%**)
South Africa (**91.23%**)
Ghana (**88.62%**)
Ethiopia (**88.59%**)
Botswana (**85.78%**)
Senegal (**85.26%**)
Togo (**84.67%**)
Cabo Verde (**82.43%**)
Mauritania (**78.30%**)
Rwanda (**77.9529%**)
Madagascar (**77.35%**)
Kenya (**75.41%**)

Appendix - 3: Acknowledgement

The AFI acknowledges the invaluable works of the following Annual Safety Report Team (ASRT) Members who contributed to the productions of the AFI Annual Safety Reports; and all those who in one way or the other, contributed inputs to the Reports:



Kebba L. Jammeh,
ICAO



James Danga,
AFCAC



Maury Seck,
AIRBUS



Nancy Vachon
BOEING



Jennifer Aisha Yeates
IATA



The Annual Safety Report Team (ASRT) Members hereby pay tribute to our former colleague, **Mr. Blessing Kawai**, the former Chairperson of the ASRT; and former Assistant Director, Africa and Indian Ocean, Safety & Flight Operations, IATA, who passed-on on 14 April 2025. He shall ever be remembered for the great works and contributions towards enhancing aviation safety not only in Africa but the world at large. May his soul rest in perfect peace!

Civil Aviation Safety Partners



ICAO



AIRBUS

PART 2 – AIR NAVIGATION REPORT

1. INTRODUCTION

1.1. Background

- 1.1.1. ICAO Member States in adopting the convention on international civil aviation in 1944, also known as the Chicago convention, committed through its article 28 to provide aerodrome and air navigation facilities and services.
- 1.1.2. In addition, ICAO council decided in 1997 to publish regional air navigation plans that contain current to medium term mandatory regional requirements related to aerodrome and air navigation facilities and services to be implemented by States in accordance with regional air navigation agreements and requirements specific to the region which are not covered in the ICAO Standards and Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS).
- 1.1.3. In order to ensure a harmonized global development of air navigation system, ICAO issued the Global Air Navigation Plan (GANP), which throughout its improvement process, provided in its 6th Edition a four-layer structure including the technical framework made of the essential services and facilities, also known as the Basic Building Blocks (BBB), and the modernization methodology and its technology roadmap, named as the Aviation System Block Upgrades (ASBU). ICAO Member States are expected to provide the BBBs and ensure their continuous improvement and modernization through the ASBU elements.
- 1.1.4. APIRG/20 called for AFI State to provide information on the status of implementation of ASBU modules using the Air Navigation Reporting Forms (ANRFs) or other reporting tools as may be provided, at least twice a year. APIRG/20 further recommended the development of annual air navigation reports reflecting the status of implementation of essential services and facilities as well as the ASBU modules.
- 1.1.5. This annual AFI air navigation report focuses on the status of implementation of BBBs and ASBU elements in the AFI region. It also presents the impact of regional air navigation system performance on other ICAO strategic objectives such as the reduction of environmental impact of aviation activities.

1.2. Collection of data

- 1.2.1. Information provided in this report contain generic data collected from sources such as the GANP portal, the AFI Regional air navigation plan, the AANDD platform.
- 1.2.2. Information provided on States' ASBU implementation status were collected through regional surveys, regional office mission to the States and contributions from ANSPs, Airport operators, airspaces users, manufacturers and other Stakeholders.
- 1.2.3. It is anticipated with optimism that the operationalization of the AFI ASBU online reporting tool under the AANDD will incentivize more reporting from the States and therefore enable for a more consistent annual air navigation report in the future.

2. BASIC BUILDING BLOC FRAMEWORK

- 2.0.1. The Basic Building Block (BBB) framework outlines the foundation of any robust air navigation system. It represents the identification of the essential services to be provided for international civil aviation in accordance with ICAO Standards. These essential services are defined in the areas of aerodromes (AOP), air traffic management (ATM), search and rescue (SAR), meteorology (MET) and information management (AIM). In addition to essential services, the BBB framework identifies the end users of these services as well as the assets (communications, navigation, and surveillance (CNS) infrastructure) that are necessary to provide them.
- 2.0.2. The BBB is considered an independent framework and not a block of the ASBU framework as they represent a baseline rather than an evolutionary step. This baseline is defined by essential services recognized by ICAO Member States as necessary for international civil aviation to develop in a safe and orderly manner. Once these essential services are provided, they constitute the baseline for any operational improvement.
- 2.0.3. The BBB framework in the AFI region is governed by the Chicago convention, the global air navigation as well as requirements of the regional air navigation plan, the regional supplementary procedures as well as national specific legislation and policies.

2.1. AERODROME OPERATIONS (AOP)

BBB Framework in AOP

Basic modules and elements

- 2.1.1 Services related to the management and operation of the physical aerodrome, including safety, vehicle management, and landside operations.

Support and end users

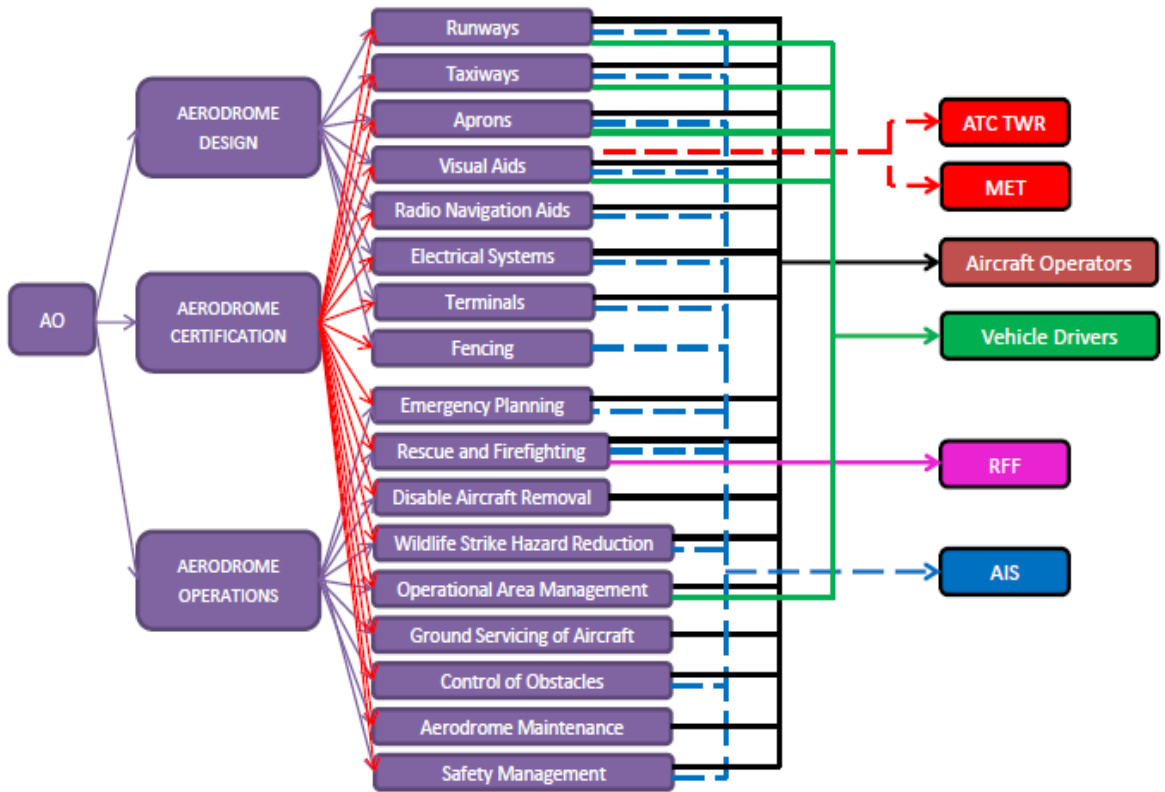


Figure 1-BBB Aerodrome -support and end users' architecture

Status of BBBs in AOP.

Essential aerodrome operations services

2.1.2 Aerodrome operators, aircraft operators, air traffic controllers, ground handling agents, pilots and air traffic flow managers share live information that may be dynamic, in order to make better and coordinated decisions.

2.1.3 This applies notably in day-to-day operations and also in case of severe weather conditions or in case of emergencies of all kinds; for these cases A-CDM procedures are referred to in the reporting of Runway Surface Conditions (GRF), the aerodrome emergency response plan and the aerodrome manual. In some cases, aerodromes are connected to the ATM network via the ATFM function or to ATC through data exchange

Required aerodrome facilities

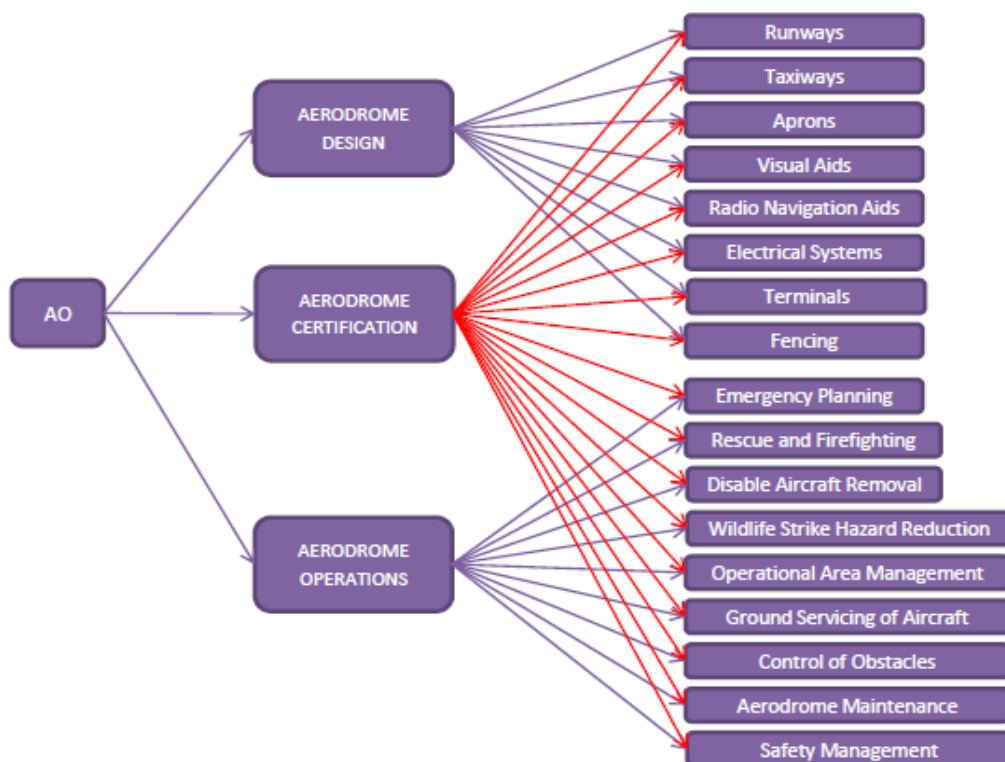


Figure 2-BBB Aerodrome -facilities architecture

2.2. AIR TRAFFIC MANAGEMENT (ATM)

2.2.1 Air Traffic Management (ATM) is the dynamic, integrated management of air traffic and airspace including air traffic services (ATS), airspace management (ASM) and air traffic flow management (ATFM) — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

2.2.2 The effective and safe provision of ATS requires the planning, organization and coordinated management of the airspace. ATS and ASM are therefore essential ATM services that AFI States are mandated to make available to international civil aviation to facilitate the movement of the people and goods in the continent.

BBB Framework in ATM

2.2.3 Under the Global Air Navigation Plan framework, these foundational services (ASM and ATS) are described through the identification of the end users of these services as well as the enablers mainly in communication, navigation as surveillance infrastructure that are necessary to provide them.

Basic modules and elements

2.2.4 Basic ATM modules are the services that each State must make available to international civil aviation to fulfil its obligations under Article 28 of the Chicago convention. BBB ATM modules are made of ATS and ASM.

2.2.5 Basic ATM elements are the units and their related deliverables in each module that are made available to the international civil aviation community. These units include:

Table 1-BBB ATM-Services and deliverable

BBB Module	BBB element	Service provided	Deliverable
ATS	Aerodrome Flight Information Service unit (AFIS)	Aerodrome flight information	Aerodrome Traffic information MET information Operational information Coordination of traffic Alert
	Aerodrome Control Tower (TWR)	Aerodrome air traffic control	Ground clearance Departure clearance Landing clearance Aerodrome separation Traffic information MET information Operational information Coordination of traffic Alert
	Approach control unit (APP)	Approach air traffic control	Arrival clearance Approach clearance Separation Traffic information MET information Operational information

			Coordination of traffic Alert
	Flight Information Center (FIC)	Flight information service	En route Traffic information MET information Operational information Coordination of traffic Alert
	Area Control Center (ACC)	Area air traffic control	En route clearance Separation En route Traffic information MET information Operational information Coordination of traffic Alert
ASM	The Airspace Design Unit (ADU)	Procedure design	Instrument flight procedure (IFP) VFR chart
		Route design	ATS route network
		Airspace segregation	Design of Special Use Airspace (SUA)

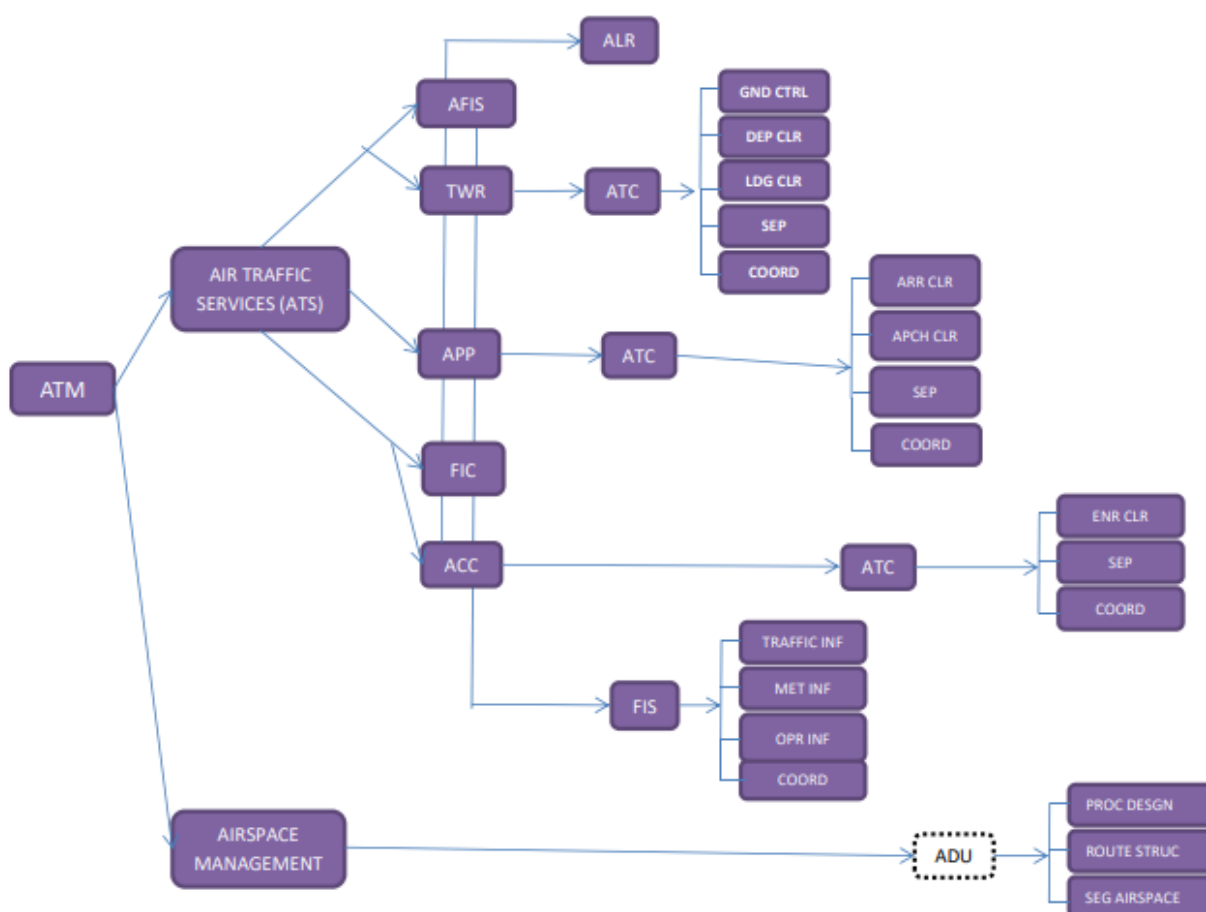


Figure 3-BBB ATM -modules and elements

Support and end users

2.2.6 The provision of essential ATM is supported by essential infrastructures and services in air-ground, ground-ground communication, aeronautical meteorology, maintenance service, as well as procedure and route design. The provision of the essential ATM is effective through the identification of the end users and their activities and products.

Table 2-BBB ATM-Support and end users

BBB Module	BBB element	Support	End Users
ATS	AFIS	VHF/HF: Mobile communication (CNS) AFTN/Telephone: Ground communication (CNS) Aeronautical maps (ADU)	Flight Operations RCC/RSC MET Offices ATS Units Aerodrome Operators
	TWR	VHF/HF : Mobile communication (CNS) AFTN/Telephone: Ground communication (CNS)	Flight Operations RCC/RSC MET Offices ATS Units

BBB Module	BBB element	Support	End Users
		Aeronautical maps and instrument flight procedures (ADU)	Aerodrome Operators
	APP	VHF/HF: Mobile communication (CNS) AFTN/Telephone: Ground communication (CNS) Aeronautical maps, instrument flight procedures (ADU)	Flight Operations RCC/RSC MET Offices ATS Units Aerodrome Operators
	FIC	HF: Mobile communication (CNS) AFTN/Telephone: Ground communication (CNS) Aeronautical maps (ADU)	Flight Operations RCC/RSC MET Offices ATS Units
	ACC	VHF/HF: Mobile communication (CNS) AFTN/Telephone: Ground communication (CNS) Aeronautical maps (ADU)	Flight Operations RCC/RSC MET Offices ATS Units
ASM	ADU	Airspace design software	Flight operations ATS RCC/RSC

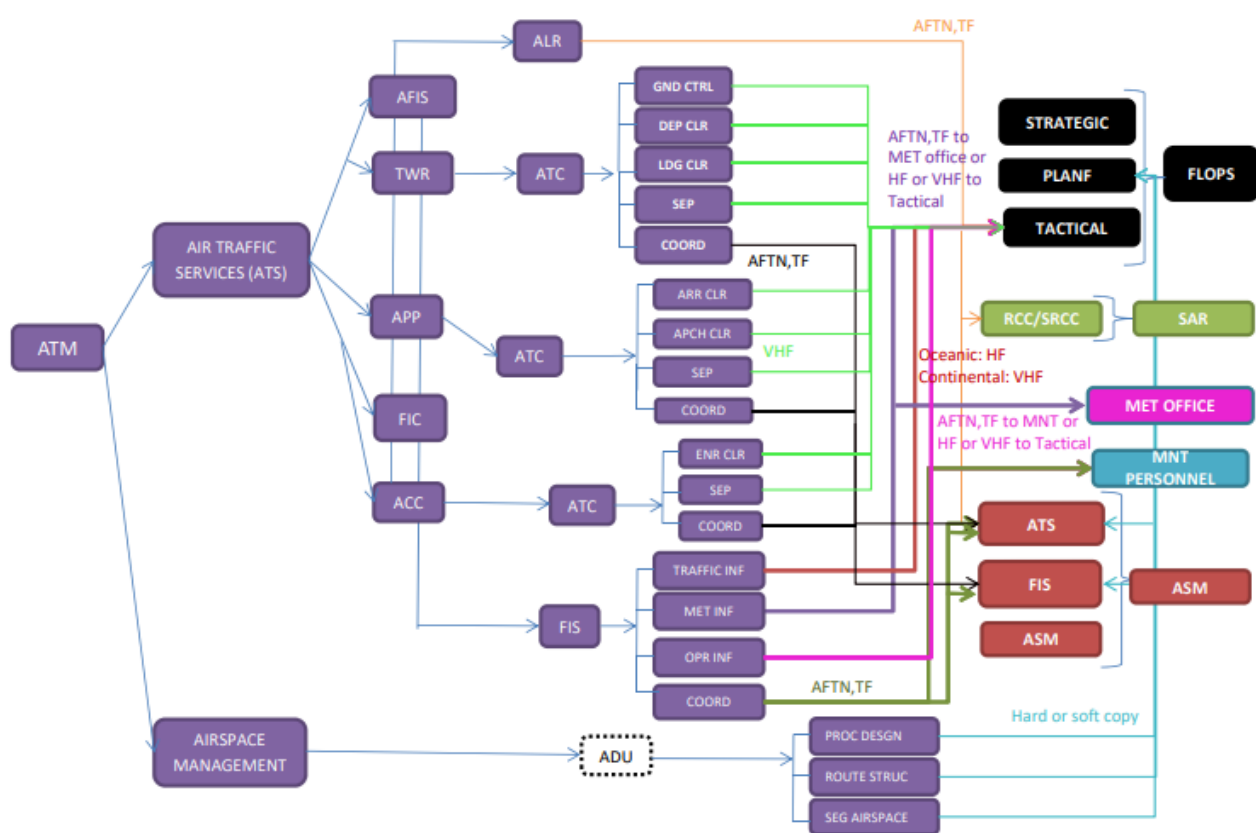


Figure 4-BBB ATM -support and end users

Status of BBBs in ATM.

Airspace organization in AFI

2.2.7 AFI airspace is organized in accordance with ICAO Annex 11 and based on regional agreements or bilateral agreements between States. The airspace layout in AFI is made of Flight information regions within which specific airspace sectorization is established. Airspace organization in AFI is not necessarily constraint to national boundaries but is rather based on the type of air traffic services provided and operational constraints.

AFI Flight Information Regions

2.2.8 AFI airspace is divided into thirty-one (31) Flight Information Region (FIR) which mostly spread above the territory of several States and over the high seas in the Atlantic and Pacific Oceans. These FIRs including twenty (22) in ESAF and nine (9) in WACAF as described in Table 3.

Table 3-BBB ATM-AFI Flight Information Regions

#	FIR	ICAO Area of accreditation	States covered	High sea covered
1.	Accra	WACAF	Benin Ghana Togo	South Atlantic Ocean
2.	Addis Ababa	ESAF	Djibouti Ethiopia	None
3.	Antananarivo	ESAF	Comoros Madagascar Reunion	Pacific Ocean
4.	Asmara	ESAF	Eritrea	Pacific Ocean
5.	Beira	ESAF	Mozambique	Pacific Ocean
6.	Brazzaville	WACAF	Cameroon Central African Republic Congo Equatorial Guinea Gabon Sao Tome and Principe	None
7.	Bujumbura	ESAF	Burundi	None
8.	Cape Town	ESAF	South Africa	South Atlantic Ocean

#	FIR	ICAO Area of accreditation	States covered	High sea covered
9.	Dakar	WACAF	Burkina Faso Cote D'Ivoire Gambia Guinea Bissau Mali Mauritania Senegal	South Atlantic Ocean
10.	Dar Es Salaam	ESAF	United Republic of Tanzania	Pacific Ocean
11.	Entebbe	ESAF	Uganda	None
12.	Gaborone	ESAF	Botswana	None
13.	Harare	ESAF	Zimbabwe	None
14.	Johannesburg	ESAF	Lesotho South Africa Eswatini	None
15.	Johannesburg Oceanic	ESAF	South Africa	South Atlantic Ocean
16.	Kano	WACAF	Nigeria	None
17.	Khartoum	ESAF	South Sudan	None
18.	Kigali	ESAF	Rwanda	None
19.	Kinshasa	WACAF	Democratic Republic of Congo	None
20.	Lilongwe	ESAF	Malawi	None
21.	Luanda	ESAF	Angola	South Atlantic Ocean
22.	Lusaka	ESAF	Zambia	None
23.	Mauritius	ESAF	Mauritius	Pacific Ocean
24.	Mogadishu	ESAF	Somalia	Pacific Ocean
25.	Nairobi	ESAF	Kenya	Pacific Ocean
26.	N'Djamena	WACAF	Cameroon Central African Republic Chad Niger	None
27.	Niamey	WACAF	Benin Burkina Faso Mali Niger	None
28.	Roberts	WACAF	Guinea Liberia Sierra Leone	None

#	FIR	ICAO Area of accreditation	States covered	High sea covered
29.	Sal	WACAF	Cabo Verde	South Atlantic Ocean
30.	Seychelles	ESAF	Seychelles	Pacific Ocean
31.	Windhoek	ESAF	Namibia	South Atlantic Ocean

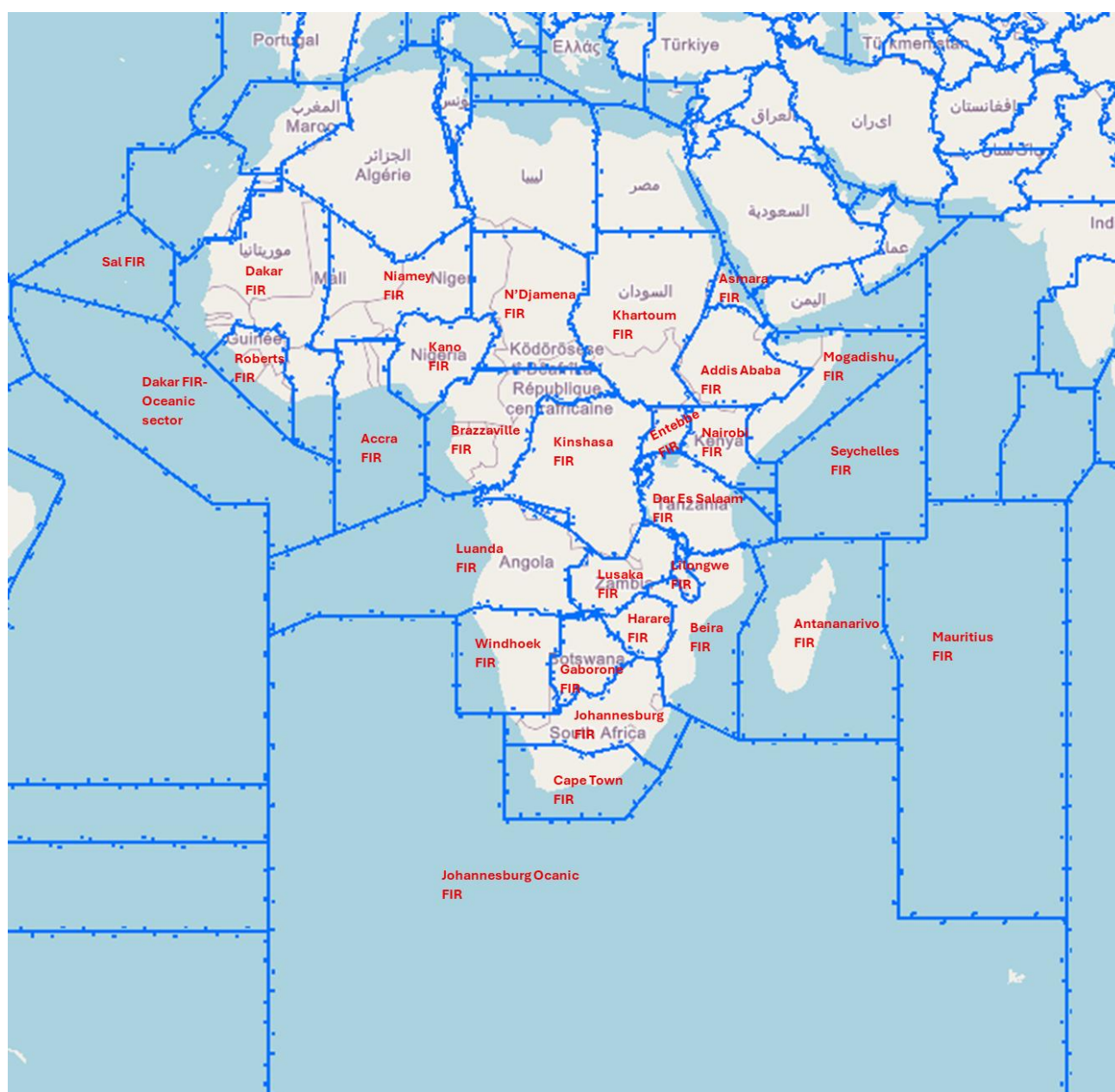


Figure 5-AFI Flight Information Regions

AFI FIR sectorization and classification

2.2.9 The classification of airspaces in the AFI is conducted as per ICAO Annex 11 based on type of air traffic services provided therein.

Status of Air Traffic services in AFI

2.2.10 The Air traffic services (ATS) is provided through three types of services namely the air traffic control service (ATC), the flight information service (FIS) and the alert service (ALR). However, the provision of ATC is dependent on the airspace classification in accordance with ICAO Annex 11(section 2.6) as described in Table 4

Table 4-BBB ATM-AFI Airspace classification

Class of airspace	Flights permitted (IFR/VFR)	Type of ATS provided
Class A	IFR flights only	ATC (IFR/IFR are Separated)
Class B	IFR and VFR flights	ATC (IFR/IFR, IFR/VFR, VFR/VFR are separated)
Class C	IFR and VFR flights	ATC (IFR/IFR and IFR/VFR are separated, traffic information for VFR/VFR)
Class D	IFR and VFR flights	ATC (IFR/IFR are separated, traffic information for IFR/VFR and VFR/VFR)
Class E (control zones excluded)	IFR and VFR flights	ATC (IFR/IFR are separated, traffic information for IFR/VFR and VFR/VFR)
Class F	IFR and VFR flights	Air Traffic Advisory Service for IFR/IFR Traffic information for IFR/VFR and VFR/VFR
Class G	IFR and VFR flights	Traffic information for IFR/IFR, IFR/VFR and VFR/VFR

2.2.11 As per the flight rules provisions of Annex 2, VFR flights are not allowed above FL195. However, in accordance with the AFI regional Supplementary Procedure (Doc7030, AFI-Part I) VFR flights must be operated up to FL145 in the AFI airspace.

2.2.12 Based on this classification, AFI FIR/UIR are sectorized and classified based on the type of ATS provided and the operational constraints such as air-ground communication limitations and NAVAIDS coverages and the need for efficient service. An FIR may contain at the same time

- ✓ The Terminal control Area (TMA): From minimum 700ft AMSL up to FL245; TMA can be of class A, B, C or D.
- ✓ The Upper control Area (UTA): From FL245 to unlimited. UTA are of class A only.
- ✓ The Control Area (CTA): TMA/UTA + ATS routes serving designated aerodromes under the TMA. CTA can be of class A, B, C or D.

- ✓ The Control zone (CTR): expands at least 5NM laterally from the concerned aerodrome center point and from surface contact up to the lower limit of the TMA or as defined by the ATS authority. can be of class A, B, C or D
- ✓ The Uncontrolled airspace: any portion of the FIR outside CTR, TMA, CTA or UTA. They are usually of class F or G.

2.2.13 Table 5 presents the status of airspace classification and the type of ATS provided in the AFI FIRs. The report covers only CTR established around main international aerodromes published in the AFI Air Navigation Plan.

Table 5-BBB ATM-AFI Airspace organization

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
1.	Accra	Ghana	Accra CTR	C	Aerodrome control	DGAA
2.			Accra TMA	A/B	Approach control	
3.			Tamale TMA	C	Approach control	
4.		Benin-Ghana-Togo	Accra UTA	A	Area control	
5.			Outside CTR and TMA below FL245 over Ghana	G	Flight information	
6.		Benin	Cotonou CTR	C	Aerodrome control	DBBB
7.		Benin & Togo	Cotonou TMA	C	Approach control	
8.		Togo	Lome CTR	C	Aerodrome control	DXXX
9.		Benin & Togo	Lome UTA	A	Area control	
10.	Addis Ababa	Ethiopia	Bole CTR	C	Aerodrome control	HAAB
11.			Dir Dawa CTR	D	Aerodrome control	HADR
12.			Addis Ababa TMA	C	Approach control	
13.		Ethiopia & Djibouti	Addis Ababa FIR Above FL245	A	Area control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
14.		Ethiopia & Djibouti	Outside CTRs, TMAs and ATS routes below FL245 over Ethiopia & Djibouti	G	Flight information	
15.		Djibouti	Djibouti CTR	D	Aerodrome control	HDAM
16.	Antananarivo	Madagascar	Antananarivo CTR	C	Aerodrome control	FMMI
17.			Antananarivo TMA	A & C	Approach control	
18.			Tomasina TMA	C	Approach control	
19.			Mahajanga TMA	A & C	Approach control	
20.			Antananarivo UTA	A	Area control	
21.		Madagascar & Comoros & Seychelles	Antananarivo FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
22.		Comoros Islands	Moroni CTR	C	Aerodrome control	FMCH
23.			Moroni TMA	A & C	Approach control	
24.		La Reunion	La Reunion CTR	C	Aerodrome control	FMEE
25.			La Reunion TMA	A & D	Approach control	
26.	Asmara	Eritrea	Asmara CTR	D	Aerodrome control	HHAS
27.			Asmara TMA	A/D	Approach control	
28.			Asmara UTA	A	Area control	
29.			Asmara FIR-Outside CTRs, TMAs and	G	Flight information	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
			ATS routes below FL245			
30.	Beira	Mozambique	Maputo CTR	D	Aerodrome control	FQMA
31.			Maputo TMA	A/D	Approach control	
32.			Beira TMA	A/D	Approach control	
33.			Chingodzi TMA	D	Approach control	
34.			Pemba TMA	D	Approach control	
35.			Nacala TMA	D	Approach control	
36.			Nampula TMA	D	Approach control	
37.			Quelimane TMA	D	Approach control	
38.			Vilankulo TMA	D	Approach control	
39.			Beira UTA	A	Area control	
40.			Beira FIR-Outside CTRs, TMA's and ATS routes below FL245	G	Flight information	
41.	Brazzaville	Congo Rep.	Brazzaville CTR	C	Aerodrome control	FCBB
42.			Pointe Noire CTR	C	Aerodrome control	FCPP
43.			Brazzaville TMA	C	Approach control	
44.			Pointe Noire TMA	C	Approach control	
45.		Cameroon-CAR-Congo-Gabon-Equatorial Guinea	Brazzaville UTA	A	Area control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
46.		Cameroon-CAR-Congo-Gabon-Equatorial Guinea	Brazzaville FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
47.		Cameroon	Douala CTR	C	Aerodrome control	FKKD
48.			Yaounde CTR	C	Aerodrome control	FKYS
49.			Douala TMA	A/C	Approach control	
50.			Ngaoundere TMA	D	Approach control	
51.			Yaounde TMA	A/C	Approach control	
52.			Douala UTA	A	Area control	
53.			Central African Republic	Bangui CTR	C	Aerodrome control
54.		Bangui TMA		A/C	Approach control	
55.		Equatorial Guinea	Malabo CTR	C	Aerodrome control	FGSL
56.		Gabon	Libreville CTR	C	Aerodrome control	FOOL
57.			Port Gentil CTR	C	Aerodrome control	FOOG
58.			Libreville TMA	A/C	Approach control	
59.			Franceville TMA	D	Approach control	
60.			Port Gentil TMA	C	Approach control	
61.		Congo-Gabon-Equatorial Guinea	Libreville UTA	A	Area control	
62.	Bujumbura	Burundi	Bujumbura CTR	D	Aerodrome control	HBBA
63.			Bujumbura TMA	A/D	Aerodrome control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
64.	Cape Town	South Africa	Cape Town CTR	B	Aerodrome control	FACT
65.			Cape Town TMA	C	Approach control	
66.			East London TMA	C	Approach control	
67.			Port Elisabeth TMA	C	Approach control	
68.			George TMA	C	Approach control	
69.			Overberg TMA	C	Approach control	
70.			Langebaanweg TMA	C	Approach control	
71.			Cape Town UTA	A	Area control	
72.			Cape Town FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
73.	Dakar	Senegal	Diass CTR	C	Aerodrome control	GOBD
74.			Dakar TMA	C	Approach control	
75.			Dakar UTA			
76.			Dakar FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
77.		Mauritania	Nouakchott CTR	C	Aerodrome control	GQNO
78.			Nouakchott TMA	C	Approach control	
79.			Nouadhibou TMA	D	Approach control	
80.			Nouakchott UTA	A		

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
81.		Mali	Bamako CTR	C	Aerodrome control	GABS
82.			Bamako TMA	C	Approach control	
83.			Bamako UTA	A	Area control	
84.		Cote d'Ivoire	Abidjan CTR	C	Aerodrome control	DIAP
85.			Abidjan TMA	C	Approach control	
86.			Bouake TMA	D	Approach control	
87.			Abidjan UTA	A	Area control	
88.		Guinea Bissau	Bissau CTR	C	Aerodrome control	GGOV
89.			Bissau TMA	C	Approach control	
90.		The Gambia	Banjul CTR	D	Approach control	GBYD
91.	Dar Es Salaam	Tanzania	Dar Es Salem CTR	D	Aerodrome control	HTDA
92.			Dar Es Salem TMA	A/D	Approach control	
93.			Sengwe TMA	D	Approach control	
94.			Mwanza TMA	D	Approach control	
95.			Kilimanjaro TMA	A/D	Approach control	
96.			Arusha TMA	D	Approach control	
97.			Tabora TMA	D	Approach control	
98.			Dodoma TMA	D	Approach control	
99.			Iringa TMA	D	Approach control	
100.			Dar Es Salem UTA	A	Area control	
101.			Dar Es Salam FIR-Outside	G	Flight information	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
			CTRs, TMAs and ATS routes below FL245			
102	Entebbe	Uganda	Entebbe CTR	D	Aerodrome control	HUEN
103			Entebbe TMA	A/D	Approach control	
104			Soroti TMA	D	Approach control	
105			Entebbe UTA	A	Area control	
106			Entebbe FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
107	Gaborone	Botswana	Gaborone CTR	D	Aerodrome control	FBSK
108			Gaborone TMA	A/D	Approach control	
109			Maun TMA	A/D	Approach control	
110			Kasane TMA	A/D	Approach control	
111			Francistown TMA	A/D	Approach control	
112			Gaborone UTA	A	Area control	
113			Gaborone FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
114	Harare	Zimbabwe	Harare CTR	D	Aerodrome control	FVRG
115			Victoria Falls CTR	D	Aerodrome control	FVFA
116			Harare TMA	A/D	Approach control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
117			Chiredzi TMA	D	Approach control	
118			Masvingo TMA	D	Approach control	
119			Bulawayo TMA	D	Approach control	
120			Thornhill TMA	D	Approach control	
121			Mwange TMA	D	Approach control	
122			Victoria Falls TMA	A/D	Approach control	
123			Kariba TMA	D	Approach control	
124			Harare UTA	A	Area control	
125			Harare FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
126	Johannesburg	South Africa	Johannesburg CTR	B	Aerodrome control	FAOR
127			Johannesburg TMA	C	Approach control	
128			Durban TMA	C	Approach control	
129			Richard Bay TMA	C	Approach control	
130			Bloemfontein TMA	C	Approach control	
131			Kinberly TMA	C	Approach control	
132			Polokwane TMA	C	Approach control	
133			Makhado TMA	C	Approach control	
134			Hoedspruit TMA	C	Approach control	
135			Kruger Mpumalanga TMA	C	Approach control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
136			Waterkloff TMA	C	Approach control	
137		Eswatini-Lesotho-South Africa	Johannesburg UTA	A	Area control	
138						
139		Eswatini	Sikhuphe CTR	D	Aerodrome control	FDSK
140			Sikhuphe TMA	A/D	Approach control	
141			Johannesburg UTA	A	Area control	
142		Lesotho	Maseru CTR	D	Aerodrome control	FXMM
143			Maseru TMA	D	Approach control	
144		Eswatini-Lesotho-South Africa	Johannesburg FIR-Outside CTRs, TMAs and ATS routes below FL200 and above FL460	G	Flight information	
145	Johannesburg Oceanic	High seas	Johannesburg Oceanic FL245-FL460	A	Area control	
146			Johannesburg Oceanic below FL245	G	Flight information	
147	Kano	Nigeria	Lagos CTR	C	Aerodrome control	DNMM
148			Abuja CTR	C	Aerodrome control	DNAA
149			Lagos TMA	C	Approach control	
150			Abuja TMA	C	Approach control	
151			Benin TMA	C	Approach control	
152			Yola TMA	C	Approach control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
153			Enugu TMA	C	Approach control	
154			Kaduna TMA	C	Approach control	
155			Kano TMA	C	Approach control	
156			Lagos UTA	A	Area control	
157			Kano UTA	A	Area control	
158			Kano FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
159	Khartoum	South Sudan	Juba CTR	D	Aerodrome control	HJJJ
160			Juba TMA	A/D	Approach control	
161			Khartoum UIR Over South Sudan above FL245	G	Flight information	
162	Kigali	Rwanda	Kigali CTR	C	Aerodrome control	HRYY
163			Kigali TMA	A/C	Approach control	
164			Kigali UTA	A	Area control	
165			Kigali FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
166	Kinshasa	Democratic Republic of The Congo	Kinshasa CTR	D	Aerodrome control	FZAA
167			Kinshasa TMA	A/D	Approach control	
168			Lubumbashi TMA	A/D	Approach control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
169			Kisangani TMA	A/D	Approach control	
170			Kindu TMA	A/D	Approach control	
171			Mbuji Mayi TMA	A/D	Approach control	
172			Kalemi TMA	A/D	Approach control	
173			Bukavu TMA	A/D	Approach control	
174			Goma TMA	A/D	Approach control	
175			Bunia TMA	A/D	Approach control	
176			Gbadolite TMA	A/D	Approach control	
177			Mbandaka TMA	A/D	Approach control	
178			Kinshasa UTA	A	Area control	
179			Lubumbashi UTA	A	Area control	
180			Kinshasa FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
181	Lilongwe	Malawi	Lilongwe CTR	D	Aerodrome control	FWKI
182			Lilongwe TMA	A/D	Approach control	
183			Blantyre TMA	A/D	Approach control	
184			Lilongwe UTA	A	Area control	
185			Lilongwe FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
186	Luanda	Angola	Luanda CTR	C	Aerodrome control	FNLU
187			Luanda TMA	A/D	Approach control	
188			Saurino TMA	D	Approach control	
189			Luená TMA	D	Approach control	
190			Huambo TMA	D	Approach control	
191			Menongue TMA	D	Approach control	
192			Ondjiva TMA	D	Approach control	
193			Lubango TMA	D	Approach control	
194			Mirabilis TMA	D	Approach control	
195			Benguela TMA	D	Approach control	
196			Luanda UTA	A	Area control	
197			Luanda FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
198	Lusaka	Zambia	Lusaka CTR	C	Aerodrome control	FLKK
199			Lusaka TMA	C	Approach control	
200			Livingstone TMA	C	Approach control	
201			Mfuwe TMA	C	Approach control	
202			Ndola TMA	C	Approach control	
203			Solwezi TMA	C	Approach control	
204			Lusaka UTA	A	Area control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
205			Lusaka FIR-Outside CTRs, TMA and ATS routes below FL245	G	Flight information	
206	Mauritius	Mauritius	Mauritius CTR	C	Aerodrome control	FIMP
207			Mauritius TMA	C	Approach control	
208			Mauritius UTA	A	Area control	
209			Mauritius FIR-Outside CTRs, TMA and ATS routes below FL245	G	Flight information	
210	Mogadishu	Somalia	Mogadishu CTR	D	Aerodrome control	HCMM
211			Mogadishu TMA	D	Approach control	
212			Ugas Khalif TMA	A/D	Approach control	
213			Hargeisa TMA	D	Approach control	
214			Mogadishu UTA	A	Area control	
215			Mogadishu FIR-Outside CTRs, TMA and ATS routes below FL245	G	Flight information	
216	Nairobi	Kenya	Nairobi CTR	C	Aerodrome control	HKJK
217			Nairobi TMA	C	Approach control	
218			Mombasa TMA	C	Approach control	
219			Eldoret TMA	C	Approach control	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
220			Wajir TMA	C	Approach control	
221			Nairobi UTA	A	Area control	
222			Nairobi FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
223	N'Djamena	Cameroon	Garoua CTR	C	Aerodrome control	FKKR
224			Garoua TMA	C	Approach control	
225		Chad	N'Djamena CTR	C	Aerodrome control	FTTJ
226			N'Djamena TMA	C	Approach control	
227		Cameroon-CAR- Chad	N'Djamena UTA	A	Area control	
228		Cameroon-CAR- Chad	N'Djamena FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
229	Niamey	Niger	Niamey CTR	C	Aerodrome control	DRRN
230			Niamey TMA	C	Approach control	
231			Niamey UTA	A	Area control	
232		Burkina Faso	Ouagadougou CTR	C	Aerodrome control	DFFD
233			Ouagadougou TMA	C	Approach control	
234		Burkina Faso-Mali-Niger	Ouagadougou UTA	A	Area control	
235		Burkina Faso-Mali-Niger	Niamey FIR-Outside CTRs, TMAs and	G	Flight information	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
			ATS routes below FL245			
236	Roberts	Guinea	Conakry CTR	D	Aerodrome control	GUCY
237			Conakry TMA	D	Approach control	
238		Sierra Leone	Freetown CTR	D	Aerodrome control	GFLI
239			Freetown TMA	D	Approach control	
240		Liberia	Monrovia CTR	D	Aerodrome control	GLRB
241			Roberts TMA	A/D	Approach control	
242			Robert UTA	A	Area control	
243		Guinea-Liberia-Sierra Leone	Roberts FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	
244	Sal	Cabo Verde	Sal CTR	C	Aerodrome control	GVAC
245			Pria CTR	C	Aerodrome control	GVNP
246			Sal TMA	C	Approach control	
247			Sal UTA	A	Area control	
248	Seychelles	Seychelles	Seychelles CTR	D	Aerodrome control	FSIA
249			Seychelles TMA	A & D	Approach control	
250			Seychelles UTA	A	Area control	
251			Seychelles FIR-Outside CTRs, TMAs and ATS	G	Flight information	

#	FIR	States	Sectors	Airspace classification	Type of ATS Provided	Major International aerodrome supported (ICAO Code)
			routes below FL245			
252	Windhoek	Namibia	Windhoek CTR	D	Aerodrome control	FYWH
253			Windhoek TMA	C	Approach control	
254			Walvis Bay TMA	C	Approach control	
255			Windhoek UTA	A	Area control	
256			Namibia FIR-Outside CTRs, TMAs and ATS routes below FL245	G	Flight information	

2.2.14 Table 5 provides data on the numbers of CTR, TMA, UTA and uncontrolled airspace established in the AFI region. It is noted that:

- ✓ The whole AFI Upper airspace (FL245 – FL460) is of class A except the portion of the airspace over South Sudan above FL245 which has been downgraded to class G due to the ongoing contingency situation in Khartoum FIR.
- ✓ The TMA are established around all international aerodromes and some national aerodromes and classified as B, C or D as shown in chart 1 below.

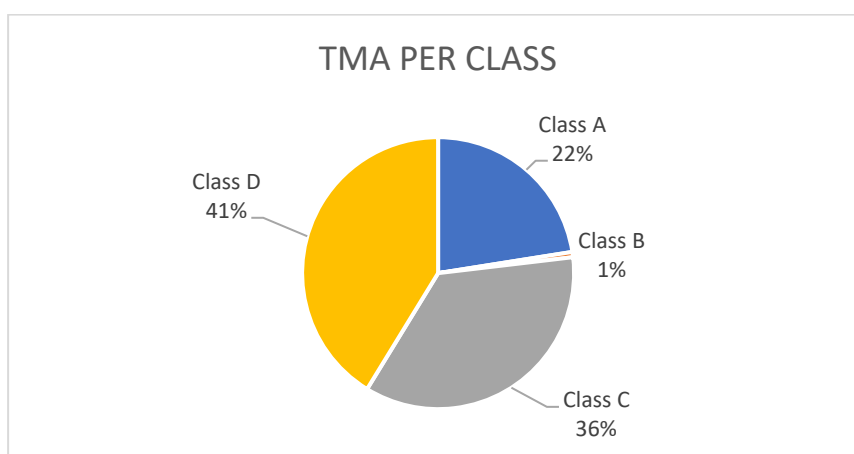


Chart 1-AFI TMA classification distribution

- ✓ The CTR are established around all international aerodromes and some national aerodromes and classified as B, C or D as show in the Chart 2 below

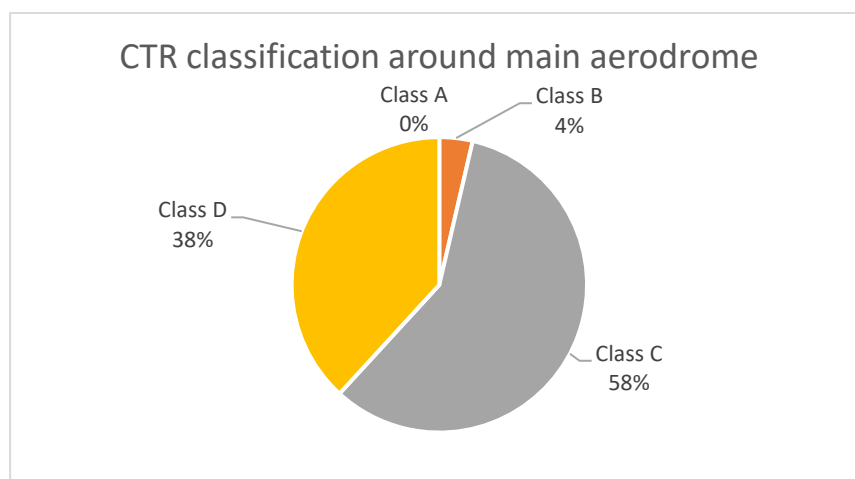


Chart 2-AFI CTR classification distribution

- ✓ The uncontrolled airspaces are mainly portions of FIRs outside CTRs, TMAs and ATS routes below FL245 or the upper airspace above FL460. Most city pairs within the same FIRs are linked by ATS routes in which air traffic control service is provided.

Required facilities

Routes & Procedures

- 2.2.15 Routes and procedures considered in the scope of this report include ATS routes, arrival routes (STAR), departure routes (SID) and approach procedures that are implemented at all major international aerodromes in the AFI region.
- 2.2.16 The focus is placed on the types of ATS routes available (regional conventional, regional PBN), the type of arrival/departure routes (conventional, PBN, CCO/CDO) and the type of approach procedures (ILS, VOR/DME, RNP with LNAV, RNP with APV).
- 2.2.17 Table 6 summarizes the status of routes types and procedures servicing major international aerodromes.

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Angola	FNLU	0	0	0	0	2	0	1	2	None	None	ILS, LOC, VOR/DME, RNP
Benin	DBBB	1	0	0	0	0	1	0	3	Conventional arrival, RNP Arrival	None	ILS, LOC, VOR, RNP
Botswana	FBSK	0	0	0	0	0	2	1	0	Conventional arrival, RNP STAR	RNP SID	ILS, LOC, VOR, RNP
Burkina Faso	DFFD	0	0	0	0	0	0	3	3	Conventional arrival, RNP STAR with CDO	RNP SID with CCO	ILS, VOR, NDB, RNP
Burundi	HBBA	1	1	0	0	2	1	0	0	None	None	ILS, VOR/DME
Cabo Verde	GVAC	0	0	0	0	1	1	0	1	Conventional arrival, RNP STAR with CDO	Conventional SID, RNP SID with CCO	ILS, LOC, VOR, RNP
	GVNP	0	0	0	0	0	0	0	0	Conventional arrival, RNP STAR with CDO	Conventional SID, RNP SID with CCO	VOR, NDB, RNP
Cameroon	FKKD	0	0	0	0	1	1	1	3	Conventional arrival, RNP STAR	Conventional SID	ILS, LOC, VOR, RNP
	FKYS	0	0	0	0	0	0	0	1	Conventional arrival, RNP STAR	Conventional SID	ILS, LOC, VOR, NDB, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
	FKKR	0	0	0	0	0	0	1	0	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Central African Republic	FEFF	1	0	0	0	2	0	0	1	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Chad	FTTJ	0	0	0	0	2	0	3	0	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Comoros Islands	FMCH	0	0	0	0	0	0	0	0	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Congo Rep.	FCBB	0	0	0	0	3	1	1	0	Conventional arrival	Conventional SID	ILS, LOC, VOR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
	FCPP	0	0	0	0	0	1	0	2	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Cote d’Ivoire	DIAP	0	0	0	0	1	1	2	0	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Democratic Republic of The Congo	FZAA	0	0	0	0	2	2	1	0	Conventional arrival, RNP STAR	Conventional SID, RNP SID	ILS, LOC, VOR, RNP
	FZQA	0	0	0	0	1	1	0	0	RNP STAR	RNP SID	ILS, LOC, VOR, RNP
Djibouti	HDAM	0	1	0	0	0	1	0	1	Conventional arrival, RNP STAR with CDO	Conventional SID, RNP SID with CCO	ILS, VOR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Equatorial Guinea	FGSL	0	0	0	0	0	1	0	0	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Eritrea	HHAS	0	0	0	0	1	1	1	1	None	None	ILS, VOR, NDB, RNP
Eswatini	FDSK	0	0	0	0	0	1	3	0	None	None	ILS, LOC, VOR,
Ethiopia	HAAB	1	1	1	0	0	2	0	0	Conventional arrival, RNP STAR with CDO	Conventional SID, RNP SID with CCO	ILS, VOR, NDB, RNP
	HADR	0	1	1	0	0	0	0	0	RNP STAR	RNP SID	VOR, LCTR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Gabon	FOOL	0	0	0	0	1	1	2	2	Conventional arrival, RNP STAR with CDO	RNP SID with CCO	ILS, LOC, VOR, NDB, RNP
	FOOG	0	0	0	0	0	1	1	0	None	None	ILS, LOC, VOR, RNP
Gambia	GBYD	0	0	0	0	1	1	0	0	None	None	ILS, VOR-ILS, VOR, RNP
Ghana	DGAA	1	0	0	1	0	2	0	1	RNP STAR with CDO	RNP SID with CCO	ILS, VOR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Guinea	GUCY	0	0	0	0	1	4	1	0	RNP STAR with CDO	Conventional SID, RNP SID with CCO	ILS, VOR, NDB, RNP
Guinea Bissau	GGOV	0	0	0	0	1	1	0	0	Conventional arrival, RNP STAR with CDO	None	ILS, LOC, VOR, RNP
Kenya	HKJK	2	2	0	1	0	0	0	0	Conventional arrival, RNP STAR with CDO	Conventional SID, RNP SID with CCO	ILS, VOR-DME, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
	HKMO	1	0	0	0	0	0	0	0	RNP STAR with CDO	RNP SID with CCO	ILS, VOR-DME, RNP
La Reunion	FMEE	0	0	0	0	1	0	0	0	Conventional arrival, RNP STAR with CDO	Conventional SID, RNP SID with CCO	ILS, VOR, NDB, RNP
Lesotho	FXMM	0	0	0	0	0	0	1	0	None	None	ILS, VOR-DME, NDB-DME, RNP
Liberia	GLRB	0	0	0	0	0	2	0	0	RNP STAR with CDO	RNP SID with CCO	ILS, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Madagascar	FMMI	0	0	0	0	1	0	0	0	Conventional arrival, RNP STAR	Conventional SID, RNP SID	ILS, LOC, VOR, NDB, RNP
Malawi	FWKI	1	1	1	0	1	0	1	2	Conventional arrival, RNP STAR	Conventional SID, RNP SID with CCO	ILS, LOC, VOR-DME, RNP
Mali	GABS	0	0	0	0	3	1	2	0	Conventional arrival, RNP STAR	None	ILS, LOC, VOR, RNP
Mauritania	GQNO	0	0	0	0	1	0	0	1	Conventional arrival	None	ILS, LOC, VOR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Mauritius	FIMP	0	0	0	0	1	0	0	0	RNP STAR with CDO	RNP SID with CCO	ILS, LOC, VOR-DME, RNP
Mozambique	FQMA	0	1	0	0	0	1	3	0	RNP STAR	RNP SID with CCO	ILS, VOR-DME, RNP
Namibia	FYWH	0	0	0	0	0	0	1	1	RNP STAR	RNP SID with CCO	ILS, LOC, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
		0	0	0	0	1	1	2	1	Conventional arrival, RNP STAR with CDO	RNP SID	ILS, LOC, VOR, RNP
Niger	DRRN											
Nigeria	DNMM	1	0	0	0	0	1	0	3	RNP STAR with CDO	RNP SID with CCO	ILS, VOR-DME, RNP
	DNAA	0	0	0	0	0	0	0	0	RNP STAR with CDO	RNP SID with CCO	ILS, VOR-DME, RNP
Rwanda	HRYR	2	0	0	0	0	2	0	0	RNP STAR	RNP SID	ILS, VOR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Senegal	GOBD	0	0	0	0	1	1	0	2	Conventional arrival, RNP STAR with CDO	RNP SID with CCO	ILS, VOR, RNP
Seychelles	FSIA	3	4	3	0	0	0	0	1	RNP STAR with CDO	RNP SID with CCO	ILS, RNP
Sierra Leone	GFLI	0	0	0	0	0	3	0	0	RNP STAR	None	ILS, VOR, RNP
Somalia	HCMM	2	2	1	0	0	0	0	1	RNP STAR with CDO	RNP SID with CCO	RNP
South Africa	FACT	0	0	0	0	2	0	0	1	Conventional arrival	Conventional SID	ILS, VOR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
	FAOR	0	0	0	0	1	1	6	0	Conventional arrival, RNP STAR with CDO	Conventional SID, RNP SID with CCO	ILS, LOC, VOR, RNP
South Sudan	HJJJ	0	0	0	0	0	2	1	0	RNP STAR with CDO	RNP SID with CCO	ILS, LOC, VOR-DME, RNP
Tanzania	HTDA	0	0	1	0	1	1	0	0	RNP STAR with CDO	Conventional SID, RNP SID	ILS, LOC, VOR, NDB, RNP
	HTZA	0	0	0	0	0	0	0	0	None	None	ILS, LOC, VOR, RNP

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
Togo	DXXX	1	0	0	0	0	0	0	1	Conventional arrival, RNP STAR	RNP SID	ILS, LOC, VOR, RNP
Uganda	HUEN	2	1	0	0	1	0	1	0	RNP STAR with CDO	RNP SID with CCO	ILS, LOC, VOR, RNP
Zambia	FLKK	0	0	0	0	2	0	2	2	RNP STAR with CDO	RNP SID with CCO	ILS, VOR, NDB, RNP
Zimbabwe	FVRG	0	1	0	0	2	1	0	0	None	None	ILS, VOR, VOR-DME, NDB

Table 6-BBB ATM-AFI ATS Routes network distribution

Table 6-BBB ATM-AFI ATS Routes network distribution												
States	Major International aerodromes	Number of Regional ATS Routes								STAR Types	SID types	IFP Types
		RNAV Type				Non-RNAV Type						
		L	M	N	P	A	B	G	R			
	FVFA	0	0	0	0	0	0	0	1	None	None	ILS, VOR-DME, NDB

Chart 3-ATS ROUTES IMPLEMENTATION AT MAJOR AFI AIRPORTS

■ Regional RNAV Routes ■ Regional non-RNAV Routes

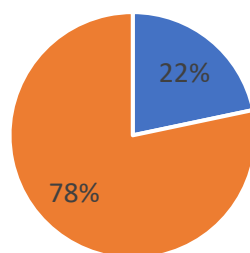
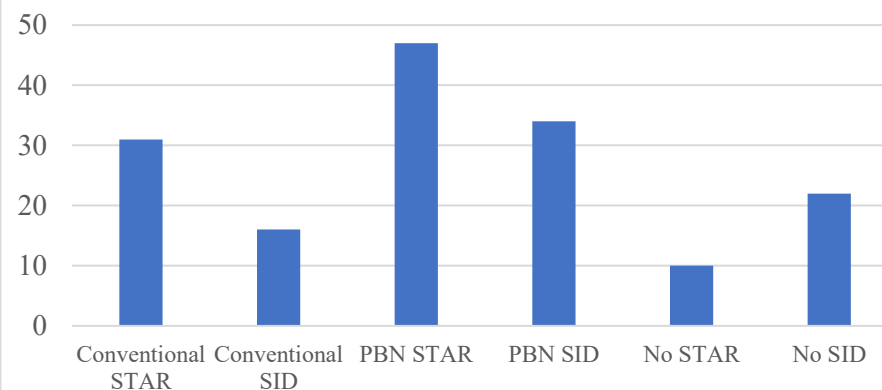


Chart 4-STATUS OF ARRIVAL/DEPARTURE ROUTES AT MAJOR AFI AERODROMES



- 2.2.18 Chart 3 shows that approximately 80% of major international aerodromes are connected through regional non-RNAV routes while 90% of the fleets servicing those aerodromes are RNAV capable.
- 2.2.19 Chart 4 indicates that at least 75% of major international aerodromes are connected through arrival routes among which 70% are PBN STARs. PBN SID represents 75% of routes.
- 2.2.20 It is observed that ten international aerodromes have no STAR and more than 20 has not established SIDs.

Table 7-Status of ATS Communication

FIR	ATS Air-Ground communication		ATS ground-ground communication	
	VHF	HF	ATS/DS	AFTN
Accra	Implemented	Implemented	Implemented	Implemented
Addis Ababa	Implemented	Implemented	Implemented	Implemented
Antananarivo	Implemented	Implemented	Implemented	Implemented
Asmara	Implemented	Implemented	Implemented	Implemented
Beira	Implemented	Implemented	Implemented	Implemented
Brazzaville	Implemented	Implemented	Implemented	Implemented
Bujumbura	Implemented	Implemented	Implemented	Implemented
Cape Town	Implemented	Implemented	Implemented	Implemented
Dakar	Implemented	Implemented	Implemented	Implemented
Dar Es Salaam	Implemented	Implemented	Implemented	Implemented
Entebbe	Implemented	Implemented	Implemented	Implemented
Gaborone	Implemented	Implemented	Implemented	Implemented
Harare	Implemented	Implemented	Implemented	Implemented
Johannesburg	Implemented	Implemented	Implemented	Implemented
Johannesburg Oceanic	Implemented	Implemented	Implemented	Implemented
Kano	Implemented	Implemented	Implemented	Implemented
Khartoum	Implemented	Implemented	Implemented	Implemented
Kigali	Implemented	Implemented	Implemented	Implemented
Kinshasa	Implemented	Implemented	Implemented	Implemented
Lilongwe	Implemented	Implemented	Implemented	Implemented
Luanda	Implemented	Implemented	Implemented	Implemented
Lusaka	Implemented	Implemented	Implemented	Implemented
Mauritius	Implemented	Implemented	Implemented	Implemented
Mogadishu	Implemented	Implemented	Implemented	Implemented
Nairobi	Implemented	Implemented	Implemented	Implemented
N'Djamena	Implemented	Implemented	Implemented	Implemented
Niamey	Implemented	Implemented	Implemented	Implemented
Roberts	Implemented	Implemented	Implemented	Implemented
Sal	Implemented	Implemented	Implemented	Implemented
Seychelles	Implemented	Implemented	Implemented	Implemented
Windhoek	Implemented	Implemented	Implemented	Implemented

2.3. AERONAUTICAL METEOROLOGY (MET)

Framework in MET

Basic modules and elements

- 2.3.1 In the domain of Aeronautical Meteorology (MET), the BBB Framework outlines core services such as meteorological observations, forecasts, warnings, climatological information, meteorological watch services (SIGMETs, AIRMETs, GAMET and AIREP) and WAFS data. These services are delivered through designated entities including Aerodrome Meteorological Offices, Meteorological Watch Offices, and global/regional centres. The framework emphasizes the integration of MET services with other air navigation components—such as ATM and aerodrome operations—supported by adequate CNS infrastructure.
- 2.3.2 The BBB Framework provides a baseline to assess and enhance MET service provision, ensuring alignment with ICAO Standards and Recommended Practices (SARPs), and enabling regional planning through the AFI Air Navigation Plan. This approach supports harmonized implementation, performance monitoring, and future upgrades under the Global Air Navigation Plan (GANP), thereby strengthening aviation safety and operational efficiency across the continent.

Table 8-BBB MET-Services and Deliverables

BBB Modules	BBB elements	Service provided	Deliverable
	Aerodrome Meteorological Office	Flight briefing services	Updated weather information provided and recorded
		Meteorological observations and reports services	Routine and special reports, local routine and special reports provided
		Aerodrome meteorological forecast services	Aerodrome forecasts, Trend forecasts, take-off forecasts and on-request forecasts provided
		Aerodrome meteorological warning services	Alerts, aerodrome warnings, wind shear warnings provided
		Aerodrome climatological information services	Aerodrome climatological tables, Aerodrome climatological summaries, meteorological observational data, and Exchange of aeronautical climatological information
	Meteorological Watch Office	SIGMET Services	Information on enroute hazardous weather
		AIRMET Services	Information on enroute hazardous weather in low level layers (if applicable)
		GAMET Services	Low level area forecast provided (if applicable)

		AIREP	ARS, PIREPs and AIREPs provided
	Global/Regional Centres	WAFS Services	SADIS API and WIFS API data sets provided
		IAVW Services	Reliable information on volcanic activities provided
		TCAC Services	Tropical cyclone advisories provided
		RMM Services	Technical and administrative support services provided

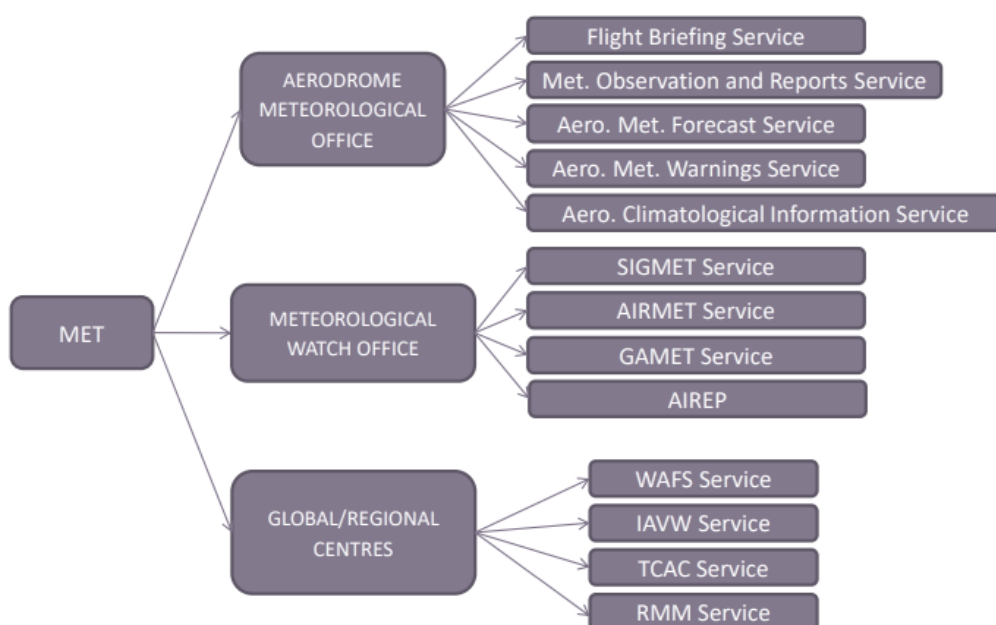


Figure 6-BBB MET-Modules and Elements

Support and end users

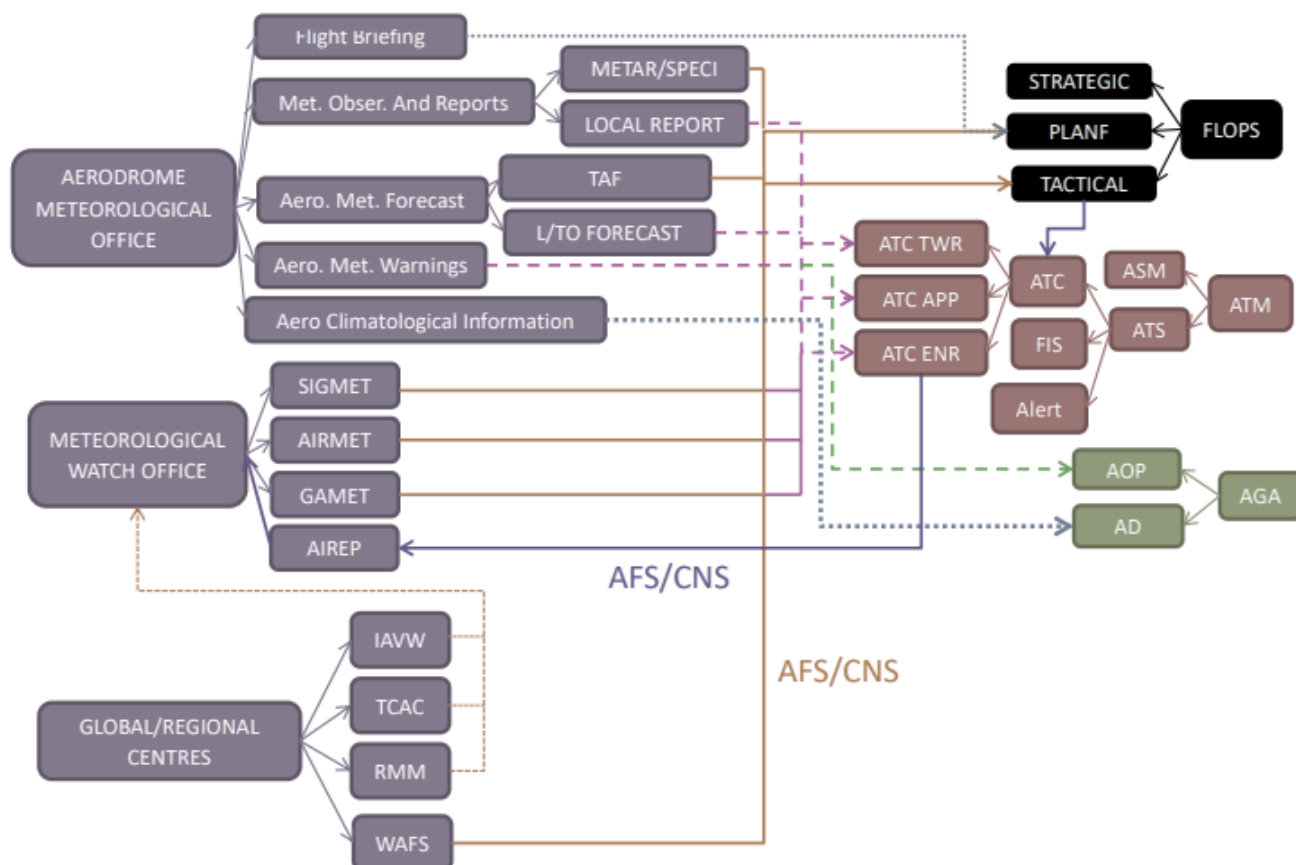


Figure 7-BBB MET-support and End users

Status of BBBs in MET.

2.3.3 The status of these BBBs extracted from the OLF in July 2025 is provided below for ESAF and WACAF Regions.

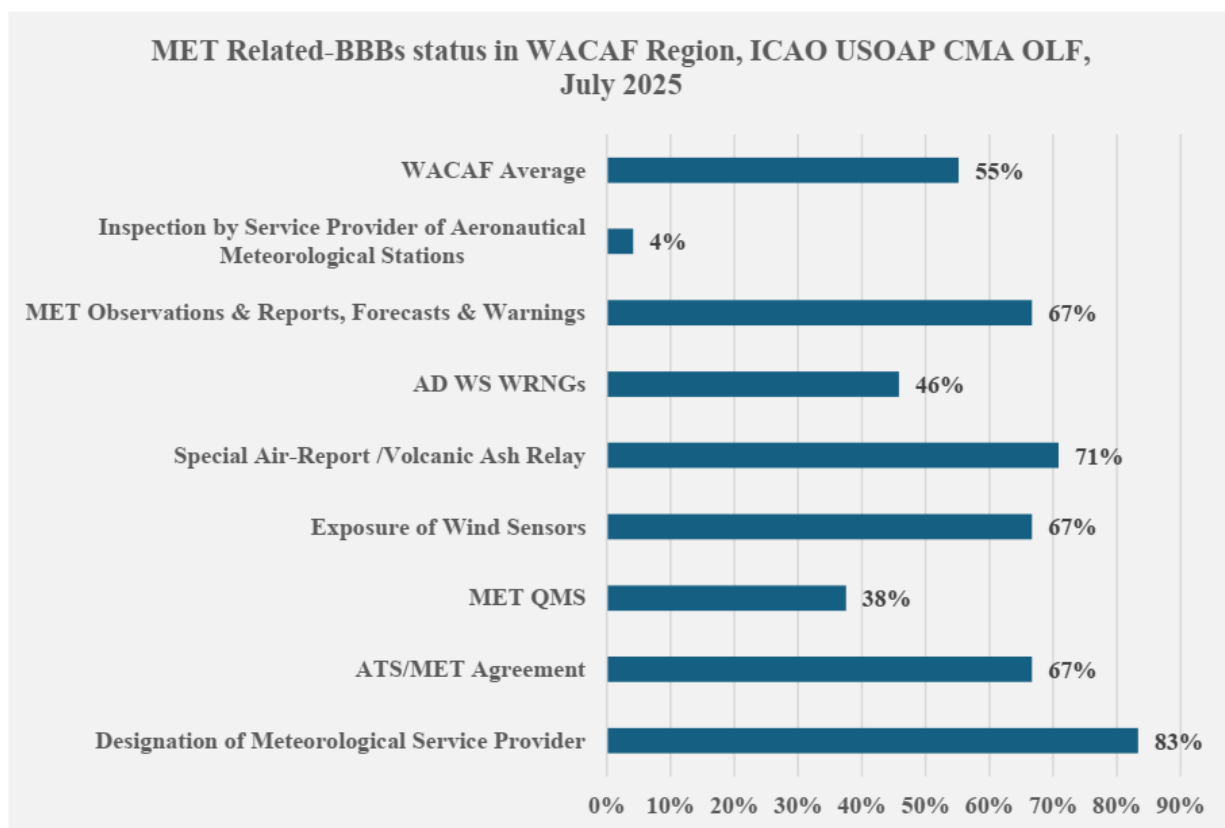
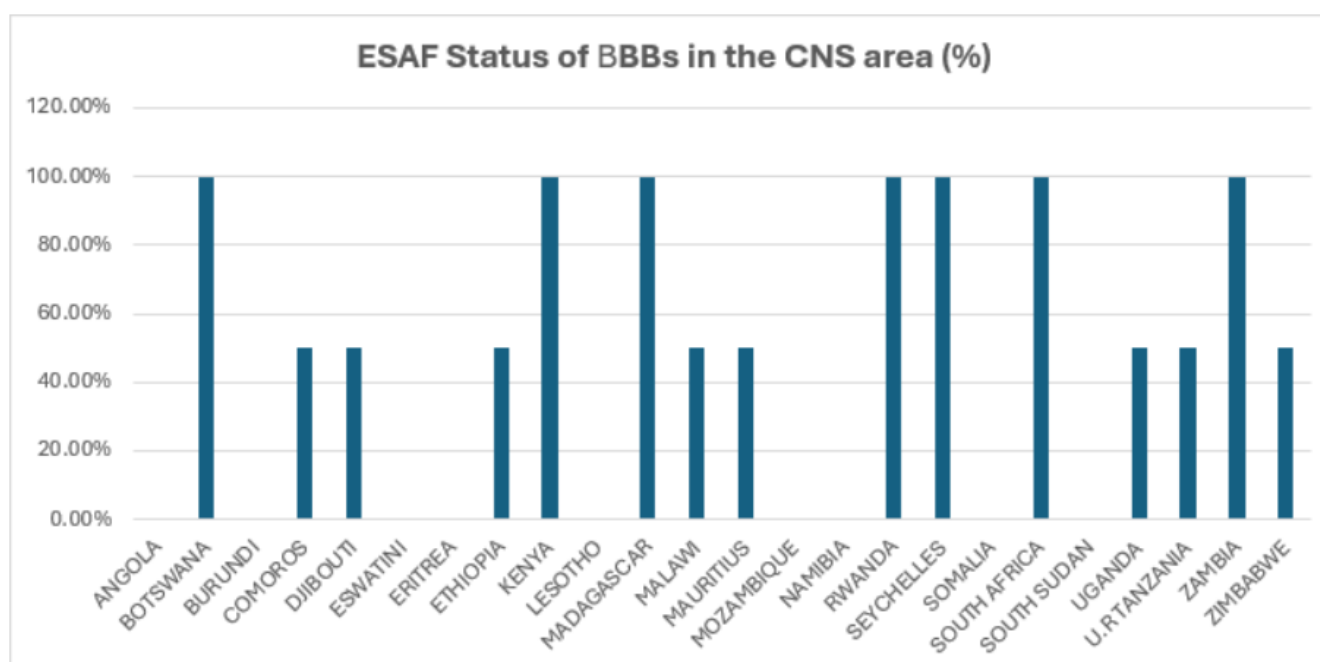


Chart 5-Status of MET BBBs



Essential MET services

2.3.4 The MET essential services include:

- Establishment of the Meteorological Service Provider for the provision of meteorological service for international air navigation
- Implementation of ATS/MET Agreement
- Implementation of MET QMS
- Exposure of Wind Sensors
- Special Air-Report /Volcanic Ash Relay
- AD WS WRNGs
- MET Observations & Reports, Forecasts & Warnings
- Technical inspection by Service Provider of Aeronautical Meteorological Stations

2.3.5 The status of MET BBBs ranges from 4% to 83%. The main challenges that might hamper the effective implementation of BBBs in the region are among others the lack of funding, inappropriate prioritization of MET projects at national level, low level of training, high turnover in State's technical expertise, low regional collaboration in the planning and reporting on ANS-MET projects. States need to strengthen their strategies for planning and implementing MET services and infrastructure. This can be achieved by adopting a collaborative project management approach that promotes the sharing of information and experience at the sub-regional or regional level.

Required MET facilities

AMHS Implementation status

2.3.6 The status of the AMHS Implementation Status in the AFI Region as discussed at the Eighth Meeting of the AASPG IIM Subgroup is provided in the table below.

Implementation of SADIS FTP and SADIS API by States

2.3.7 Table 2 provides the status of the implementation of SADIS FTP and SADIS API as reported by SADIS Provider Services. The implementation of SADIS FTP and SADIS API is provided in the table below. Information is from the results of SADIS surveys published at <https://www.icao.int/airnavigation/aeronautical-meteorological-service/documents> and the AASPG/1 Report. From that survey, it appears that 22 of the 24 ESAF States have implemented SADIS FTP, while 2 States have implemented SADIS API. For WACAF Region, 21 of the 24 WACAF States have implemented SADIS FTP, while 1 State has implemented the SADIS API.

Table 9- AMHS Implementation Status in the AFI Region

COUNTRY	Site	Corresponding	Circuit	Implemented and reported at the CMA level	Current CMA Statement	Ongoing IOT/POT testing	IOT/POT tests to be scheduled and/or pending from the neighboring center's AMHS system	Waiting for IP migration	IOT/POT tests to schedule	IOT/POT tests to be scheduled while waiting for the upgrade of the JNB AFISNET station
BENIN	COTONOU	ACCRA	RSFTA				X			
		NIAMEY	AMHS	18/10/2016						
		LOME	AMHS	30/06/2016						
		BRAZZAVILLE	AMHS	01/11/2021						
		LAKES	RSFTA				X			
BURKINA	OUAGA	NIAMEY	AMHS	18/10/2016						
		MY MOTHER	AMHS	27/04/2016						
		ACCRA	RSFTA				X			
CAMEROON	DUALA	BRAZZAVILLE	AMHS	March 2023						
		LIBREVILLE	AMHS	Dec 2022						
		KANO	RSFTA				X			
		LAKES	RSFTA				X			
		LOME	AMHS	Jan 2023						
		NDJAMENA	AMHS	Dec 2022						
		MALABO	AMHS	Dec 2022						
		BANGUI	AMHS	Jan 2023						
RCA	BANGUI	BRAZZAVILLE	AMHS	Feb. 2023						
		DUALA	AMHS	Jan 2023						
		NDJAMENA	AMHS	Jan 2022						
COMOROS	MORONI	ANTANANARIVO	RSFTA			X				
		BRAZZAVILLE	RSFTA			X				

COUNTRY	Site	Corresponding	Circuit	Implemented and reported at the CMA level	Current CMA Statement	Ongoing IOT/POT testing	IOT/POT tests to be scheduled and/or pending from the neighboring center's AMHS system	Waiting for IP migration	IOT/POT tests to schedule	IOT/POT tests to be scheduled while waiting for the upgrade of the JNB AFISNET station
CONGO	BRAZZA	BANGUI	AMHS	Feb. 2023						
		DAKAR	AMHS	03/07/2018						
		DUALA	AMHS	March 2023						
		KINSHASA	RSFTA							X
		JOHANNESBURG	RSFTA				X			
		LIBREVILLE	AMHS	March 2023						
		LUANDA	AMHS	March 2023						
		NAIROBI	AMHS	May 2022						
		N'DJAMENA	AMHS	07/07/2017						
		NIAMEY	AMHS	10/07/2017						
		SAOTOME	RSFTA						X	
		MALABO	AMHS	March 2023						
		KANO	RSFTA				X			
		ACCRA	RSFTA				X			
		HIS	AMHS	11/07/2017						
		COTONOU	AMHS	01/11/2021						
		MORONI	RSFTA			X				
		LOME	AMHS	05/07/2017						
COTE D'IVOIRE	ABIDJAN	DAKAR	AMHS	May 2023						
		NIAMEY	AFTN						X	
		LOME	AMHS	April 2023						
		MY MOTHER	AMHS	June 2023						
		ACCRA	RSFTA						X	
		NOUAKCHOTT	AMHS	July 2023						

COUNTRY	Site	Corresponding	Circuit	Implemented and reported at the CMA level	Current CMA Statement	Ongoing IOT/POT testing	IOT/POT tests to be scheduled and/or pending from the neighboring center's AMHS system	Waiting for IP migration	IOT/POT tests to schedule	IOT/POT tests to be scheduled while waiting for the upgrade of the JNB AFISNET station
		BISSAU	AMHS	March 2023						
		BANJUL	AMHS	August 2023						
		ROBERTS	RSFTA						X	
GABON	LIVREVILLE	BRAZZAVILLE	AMHS	March 2023						
		DUALA	AMHS	Dec 2022						
		ACCRA	RSFTA				X			
		DAKAR	RSFTA						X	
		LOME	RSFTA						X	
		KANO	RSFTA				X			
		LAKES	RSFTA				X			
		MALABO	AMHS	Dec 2022						
GUINEA BISSAU	BISSAU	DAKAR	RSFTA		X					
		ABIDJAN	AMHS	X						
EQUATORIAL GUINEA	MALABO	BRAZZAVILLE	AMHS	Mar 2023						
		DUALA	AMHS	Dec 2022						
		LIBREVILLE	AMHS	Dec 2022						
MADAGASCAR	HIS	JOHANNESBURG	RSFTA							X
		MORONI	RSFTA			X				
		MAURICE	RSFTA		X					
		ST DENIS	AMHS	August 2022						
		BRAZZA	AMHS	11/07/2017						
		DAKAR	AMHS	04/07/2018						
MALI	MY MOTHER	DAKAR	AMHS	03/07/2018						
		OUAGA	AMHS	27/04/2016						

COUNTRY	Site	Corresponding	Circuit	Implemented and reported at the CMA level	Current CMA Statement	Ongoing IOT/POT testing	IOT/POT tests to be scheduled and/or pending from the neighboring center's AMHS system	Waiting for IP migration	IOT/POT tests to schedule	IOT/POT tests to be scheduled while waiting for the upgrade of the JNB AFISNET station
		ABIDJAN	AMHS	June 2023						
		NOUAKCHOTT	AMHS	15/10/2015						
MAURITANIA	NOUAKCHOTT	DAKAR	AMHS	04/07/2018						
		MY MOTHER	AMHS	15/10/2015						
		CASABLANCA	RSFTA					X		
		ABIDJAN	AMHS	X						
		NIAMEY	AMHS	23/06/2016						
NIGER	NIAMEY	ALGIERS	RSFTA				X			
		ADDIS	RSFTA					X		
		N'DJAMENA	AMHS	17/03/1995						
		KANO	RSFTA				X			
		BRAZZA	AMHS	10/07/2017						
		ACCRA	RSFTA				X			
		OUAGA	AMHS	18/10/2016						
		DAKAR	AMHS	03/07/2018						
		COTONOU	AMHS	18/10/2016						
		LOME	AMHS	X						
		ABIDJAN	RSFTA						X	
		NOUAKCHOTT	AMHS	23/06/2016						
		TRIPOLI	RSFTA	X				X		
SENEGAL	DAKAR	HOUSE	RSFTA					X		
		NOUAKCHOTT	AMHS	04/07/2018						
		SAL	RSFTA					X		
		BANJUL	AMHS	25/09/2018						

COUNTRY	Site	Corresponding	Circuit	Implemented and reported at the CMA level	Current CMA Statement	Ongoing IOT/POT testing	IOT/POT tests to be scheduled and/or pending from the neighboring center's AMHS system	Waiting for IP migration	IOT/POT tests to schedule	IOT/POT tests to be scheduled while waiting for the upgrade of the JNB AFISNET station
		BISSAU	RSFTA		25/09/2018					
		ROBERTS	RSFTA					X		
		BRAZZA	AMHS	03/07/2018						
		ABIDJAN	AMHS	05/05/2023						
		MY MOTHER	AMHS	03/07/2018						
		NIAMEY	AMHS	03/07/2018						
		BRASILIA	AMHS	04/07/2018						
		JOHANNESBURG	RSFTA							X
		MADRID	RSFTA					X		
		HIS	AMHS	04/07/2018						
		LIBREVILLE	RSFTA			X				
CHAD	N'DJAMENA	NIAMEY	AMHS	17/03/1995						
		BRAZZA	AMHS	07/07/2017						
		MAIDUGURI	RSFTA				X			
		KANO	RSFTA				X			
		BANGUI	AMHS	Jan 2022						
		DUALA	AMHS	Dec 2022						
		KHARTOUM	RSFTA						X	
		TRIPOLI	RSFTA					X		
		LOME	AMHS	01/12/2015						
TOGO	LOME	ACCRA	RSFTA				X			
		COTONOU	AMHS	30/06/2016						
		NIAMEY	AMHS	1982						
		ABIDJAN	AMHS	April 2023						

COUNTRY	Site	Corresponding	Circuit	Implemented and reported at the CMA level	Current CMA Statement	Ongoing IOT/POT testing	IOT/POT tests to be scheduled and/or pending from the neighboring center's AMHS system	Waiting for IP migration	IOT/POT tests to schedule	IOT/POT tests to be scheduled while waiting for the upgrade of the JNB AFISNET station
		LIBREVILLE	RSFTA						X	
		LAKES	RSFTA				X			
		KANO	RSFTA				X			
		DUALA	AMHS	Jan 2023						
		BRAZZAVILLE	AMHS	05/07/2017						
		NDJAMENA	AMHS	01/12/2015						

STATUS OF IMPLEMENTATION OF SADIS FTP (LISTED BY ICAO REGIONS)

(28 February 2025)

Note. — Non-operational approved users, and those who no longer take the service (for whatever reason) or who have not used SADIS for a period of at least two years are indicated in italics

Key:

SADIS FTP = operational user ('X') of SADIS FTP service

* = approved SADIS hardware and/or software supplier

ICAO Contracting State		User		Location	SADIS FTP	SADIS API
No	Name	No	Name	Name		
AFI REGION						
1.	Angola	1.	INAMET	Luanda Airport	X	
2.	Benin	2.	National Meteorological Service (ASECNA)	Cotonou International Airport	X	
3.	Botswana	3.	National Meteorological Service	Gaborone Airport	X	
4.	Burkina Faso	4.	National Meteorological Service (ASECNA)	Ouagadougou Airport	X	
5.	Burundi	5.	Institute Geographique	Bujumbura	X	
6.	Cabo Verde	6.	National Meteorological Service (INMG)	Espargos	X	
7.	Cameroon	7.	National Meteorological Service (ASECNA)	Douala Airport	X	
8.	Central African Republic	8.	National Meteorological Service (ASECNA)	Bangui	X	
9.	Chad	9.	National Meteorological Service (ASECNA)	N'Djamena Airport	X	
10.	Comoros	10.	National Meteorological Service (ASECNA)	Moroni Airport	X	
11.	Congo	11.	National Meteorological Service (ASECNA)	Brazzaville Airport	X	
12.	Côte d'Ivoire	12.	National Meteorological Service (ASECNA)	Abidjan Airport	X	
13.	Democratic Republic of the Congo	13.	METTELSAT	Kinshasa Airport	X	
14.	Djibouti	14.	Service Météorologique	Djibouti Airport	X	
15.	Equatorial Guinea	15.	National Meteorological Service (ASECNA)	Malabo Airport	X	
16.	Ethiopia	16.	National Meteorological Agency	Addis Ababa Airport	X	
17.	Gabon	17.	National Meteorological Service (ASECNA)	Libreville Airport	X	
18.	Ghana	18.	National Meteorological Agency	Accra Airport	X	
19.	Guinea-Bissau	19.	Administration Météorologique	Bissau Intl. Airport	X	
20.	Kenya	20.	National Meteorological Service	Eldoret Airport	X	
	Kenya	21.	National Meteorological Service	Mombasa Airport	X	
	Kenya	22.	National Meteorological Service	Nairobi Airport	X	
21.	Lesotho	23.	National Meteorological Service	Moshoeshoe Airport	X	
22.	Liberia (Republic of)	24.	Roberts Flight Information Region	Monrovia	X	
23.	Madagascar	25.	National Meteorological Service (ASECNA)	Antananarivo/Ivato	X	
	Madagascar	26.	Meteo Madagascar	Antananarivo	X	
24.	Malawi	27.	Department of Climate Change and Meteorology	Lilongwe	X	
25.	Mali	28.	National Meteorological Service (ASECNA)	Bamako Airport	X	
26.	Mauritania	29.	National Meteorological Service (ASECNA)	Nouadhibou Airport	X	
27.	Mauritius	30.	National Meteorological Service	Vacoas	X	

ICAO Contracting State		User		Location	SADIS FTP	SADIS API
No	Name	No	Name	Name		
28.	Mozambique	31.	Instituto Nacional de Meteorologia	Maputo	X	
29.	Namibia	32.	National Meteorological Service	Windhoek	X	
30.	Niger	33.	National Meteorological Service (ASECNA)	Niamey Airport	X	
	Niger	34.	National Meteorological Service (ASECNA)	EAMAC Training School	X	
31.	Nigeria	35.	NIMET	Lagos Airport	X	
	Nigeria	36.	NIMET	Mallam Aminu Kano Airport	X	
	Nigeria	37.	NIMET	Abuja Airport	X	X
	Nigeria	38.	NIMET	Port Harcourt Airport	X	
	Nigeria	39.	NIMET	Sam Mbakwe Airport, Owerri	X	
	Nigeria	40.	NIMET	Maiduguri Airport	X	
	Nigeria	41.	NIMET	Sokoto Airport	X	
	Nigeria	42.	NIMET	Ilorin Airport	X	
	Nigeria	43.	NIMET	Akanu Ibiam Airport, Enugu	X	
	Nigeria	44.	NIMET	Umuaru Musa Yardua Airport, Kasina	X	
32.	Rwanda	45.	National Meteorological Service (ASECNA)	Kigali Airport	X	
33.	Senegal	46.	National Meteorological Service (ASECNA)	Dakar Airport	X	
	Senegal	47.	ASECNA – DTI Maintenance 1	Headquarters, Dakar	X	X
	Senegal	48.	ASECNA	Blaise Diagne Int Airport, Dakar	X	
34.	Seychelles	49.	Seychelles Meteorological Authority	Victoria, Mahá	X	
35.	Somalia	50.	Flight Information Services for Somalia	United Nations, Nairobi	X	
	Somalia	51.	Somali Civil Aviation Authority (SCAA)	Mogadishu		X
36.	South Africa	52.	South Africa Weather Services (SAWS)	Pretoria	X	
	South Africa	53.	Netsys*	Pretoria	X	X
	South Africa	54.	FlightDeck Software and Support	St Francis Bay	X	
37.	Swaziland	55.	National Meteorological Service	Mbabane	X	
38.	Togo	56.	National Meteorological Service (ASECNA)	Lomé	X	
39.	Uganda	57.	National Meteorological Authority	Entebbe Airport	X	
	Uganda	58.	National Met Authority	Soroti Aerodrome	X	
40.	United Republic of Tanzania	59.	National Meteorological Agency	Dar Es Salaam	X	
41.	Zambia	60.	Zambia Meteorological Department	Lusaka International Airport	X	
	Zambia	61.	Zambia Meteorological Department	Livingstone	X	
42.	Zimbabwe	62.	Meteorological Services Department	Harare International Airport	X	

Table 10-Status of implementation of SADIS FTP

2.4. AERONAUTICAL INFORMATION SERVICE (AIS)

2.4.1 The object of the aeronautical information service (AIS) is to ensure the flow of aeronautical data and aeronautical information necessary for global air traffic management (ATM) system safety, regularity, economy and efficiency in an environmentally sustainable manner.

BBB Framework in AIS

2.4.2 The BBB Framework in AIS includes the essential services that are required to fulfill the object of AIS outlined above.

Basic modules and elements

2.4.3 The Basic modules and elements in aeronautical information are listed in the table below:

Table 11-BBB AIS-Services and deliverables

BBB Modules	BBB elements	Service provided	Deliverable
AIS	Aeronautical data originators	Aeronautical data origination	Aeronautical data
			WGS-84 survey
	Preflight information service	NOTAM service	NOTAM
			Preflight information bulletin
	Aeronautical charts	Aeronautical charts service	Aerodrome charts
			Approach charts
			Arrival charts
			Departure charts
			En-route charts
	Aeronautical information products	Aeronautical information publication service	AIRAC adherence
			Aeronautical information publication (AIP)
			AIP Amendments
			AIP Supplements
	Postflight information service	Postflight information service	Aeronautical information circulars
			Pilots' observation of potential hazard to aircraft operations
	Quality management system	QMS processes	Quality assurance

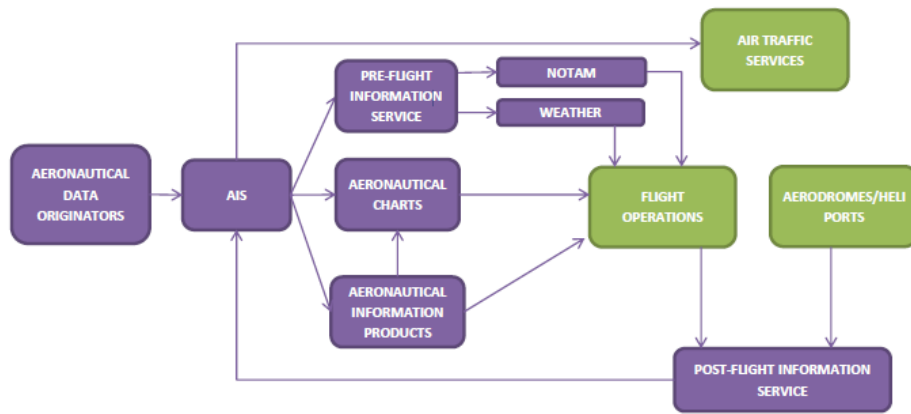


Figure 8-BBB AIS-Modules and elements

Support and end users

2.4.4 The end users of Aeronautical information services include:

- Air traffic services,
- Air operations,
- Application integrators,
- Ground proximity warning systems,
- Aircraft operating limitations analysis,
- Data providers,
- Airspace management.

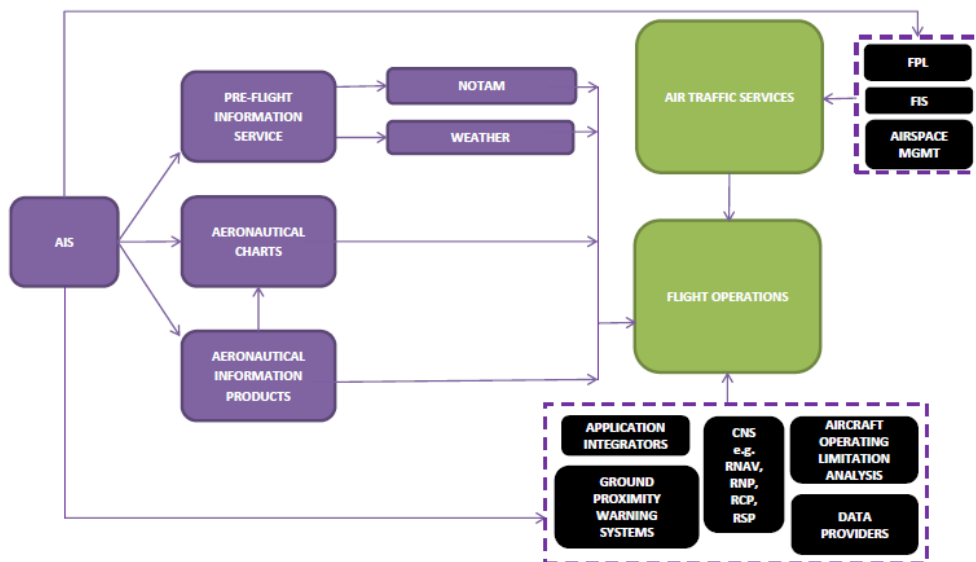


Figure 9-BBB AIS-support and End users

Status of BBBs in AIS.

2.4.5 BBBs in AIS are mostly implemented by States in the AFI region. However, there are some inconsistencies in the quality of products. The table below outlines the status of implementation as PI – Partially Implemented or FI – Fully Implemented:

Table 12-BBB AIS-implementation status

BBB elements	Service provided	Status	Comments
Aeronautical data originators	Aeronautical data origination	PI	Some States are yet to implement data approval in a systematic manner
Preflight information service	NOTAM service	PI	Some States are yet to reduce proliferation of NOTAM
Aeronautical charts	Aeronautical charts service	PI	Charts revision process to be implemented by some State
Aeronautical information products	Aeronautical information publication service	PI	Consistent update of AIP and AIRAC adherence not completed
Postflight information service	Postflight information service	FI	Postflight information is provided to AIS
Quality management system	QMS processes	PI	Some States are yet to implement QMS

Essential AIS services

2.4.6 AIS essential services are as follows:

- AMSH,
- Database Management Systems,
- Aeronautical Data and Information Processing Systems,
- Local Network,
- Public Internet.

Required AIS facilities

2.4.7 The provision of AIS services relies on the following factors:

- Aeronautical data origination,
- NOTAM service,
- Aeronautical charts service,
- Aeronautical information publication service,
- Postflight information service,
- Quality Management System processes.

2.5. SEARCH AND RESCUE (SAR)

2.5.1 The Search and Rescue service (SAR) is the performance of distress monitoring, communication, coordination and search and rescue functions, initial medical assistance or medical evacuation, through the use of public and private resources, including cooperating aircraft, vessels and other craft and installations.

2.5.2 In accordance with the AFI Air Navigation Plan, provision of SAR service and facilities are assigned responsibilities to States within the ICAO Africa-Indian Ocean region in accordance with Article 28 of the Convention on International Civil Aviation (Doc 7300) and mandatory requirements to be implemented by States in accordance with regional air navigation agreements.

2.5.3 The provision of SAR therefore represents essential services and facilities to ensure the safety of the travelling public and support the reliable and safe growth of the air transport system in the AFI region.

BBB Framework in SAR

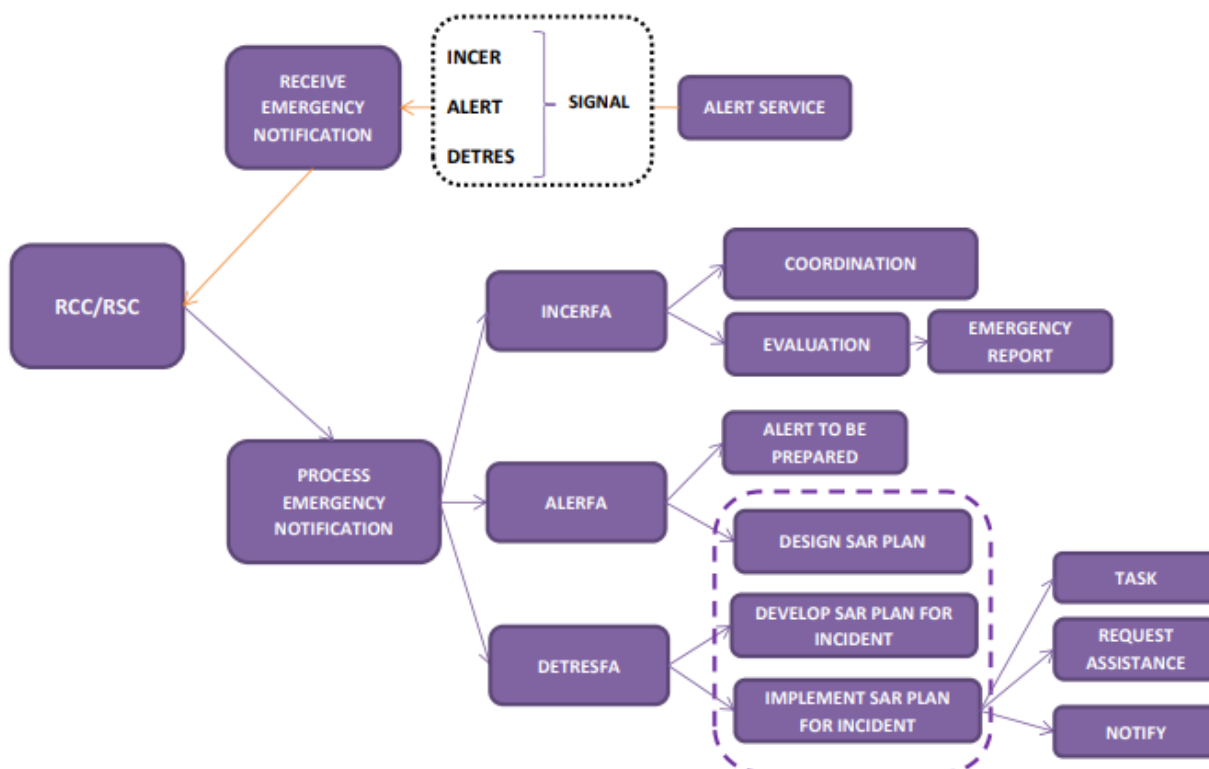


Figure 10-BBB SAR-Modules and Elements

Basic modules and elements

2.5.4 Basic SAR modules are the services that each State must make available to international civil aviation to fulfil its obligations under Article 28 of the Chicago convention. BBB SAR module consists of Search and Rescue services provided to emergency or missing aircraft.

2.5.5 Basic SAR elements are the units and their related deliverables in search and rescue that are made available to the international civil aviation community. SAR units include.

Table 13-BBB SAR-Services and deliverables

BBB Module	BBB element	Service provided	Deliverable
SAR	Rescue Coordination Center (RCC)	organization of search and rescue services and coordination of the conduct of search and rescue operations within a search and rescue region	Coordinated Search and rescue operations within the Search and rescue region (SRR)
	Rescue Subcenter (RSC)	organization of search and rescue services and coordination of the conduct of search and rescue operations within a defined area of a search and rescue region.	Coordinated Search and rescue operations within a defined area of a search and rescue region.

Support and end users

2.5.6 The provision of essential SAR is supported by essential infrastructures and services in air-ground, ground-ground communication, aeronautical meteorology, maintenance service, as well as procedure and route design.

2.5.7 The provision of the essential ATM is effective through the identification of the end users and their activities and products.

Table 14-BBB SAR-Support and End users

BBB Module	BBB element	Support	End Users
SAR	RCC/RSC	VHF/HF: Mobile communication (CNS) AFTN/Telephone: Ground communication (CNS) Aeronautical maps (ADU)	Flight Operations RCC/RSC MET Offices ATS Units State of registry SAR units Other aircraft Vessels

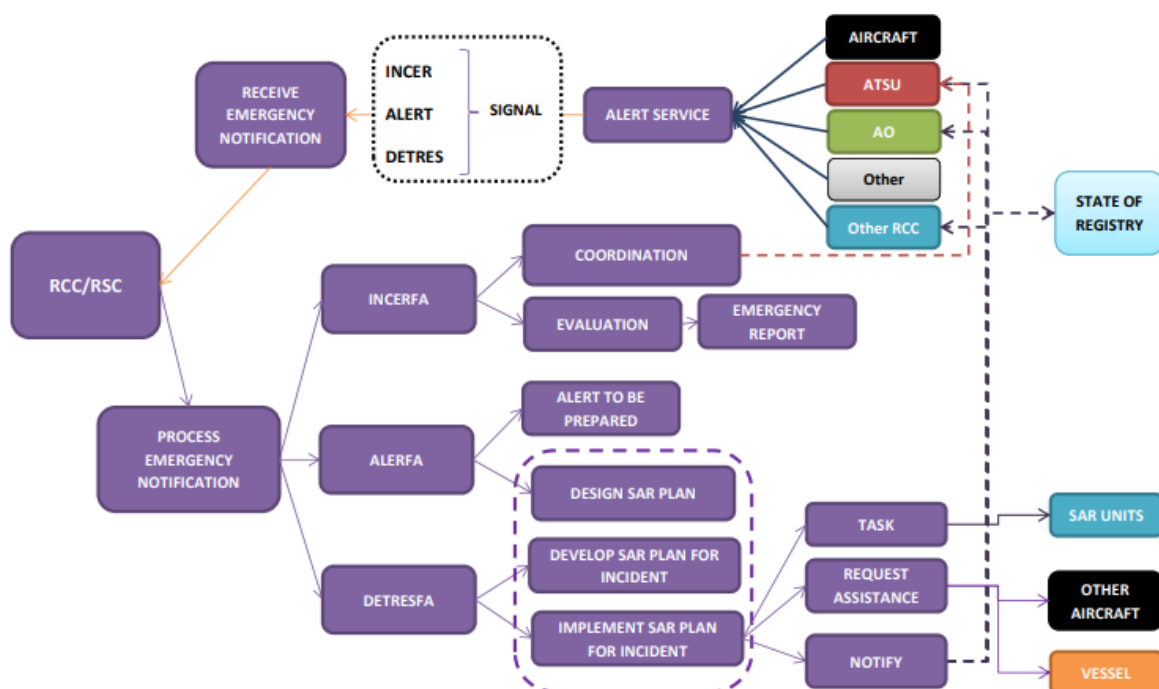


Figure 11-BBB SAR-support and End users

Status of BBBs in SAR.

Essential Aeronautical SAR services and facilities

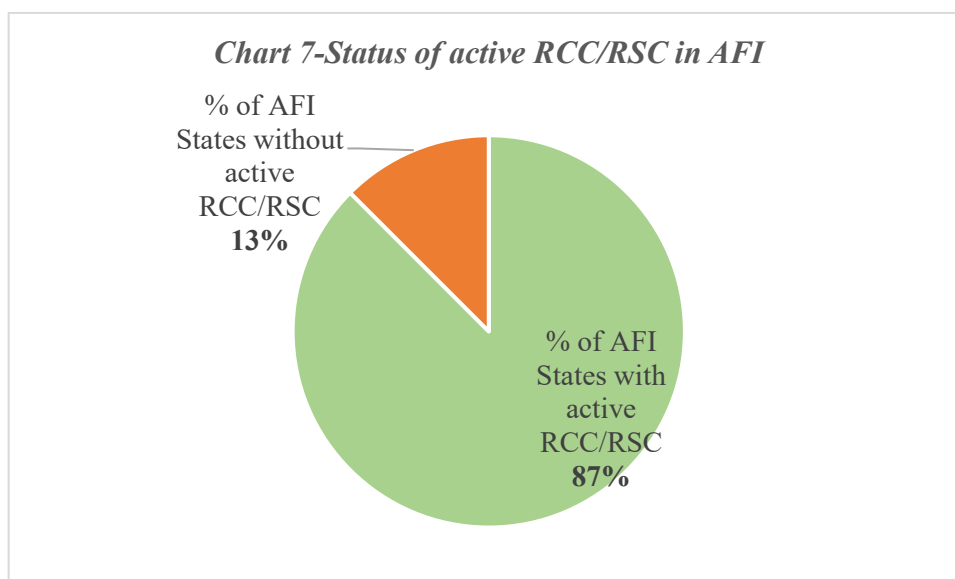
Table 15-BBB SAR-RCC/RSC facilities and status

SEARCH AND RESCUE REGION (SRR)	ASSOCIATED RCC	STATE WITH TERRITORY WITHIN THE SRR	ASSOCIATED RSC	UNIT TYPE	STATUS
Accra	RCC-Accra	Benin	RSC-Cotonou	ARSC	Operational 24/7
		Ghana	N/A	ARCC	Operational 24/7
		Togo	RSC-Lome	ARSC	Operational 24/7
		Sao Tome & Principe	NIL	RSC not Established	Not Established
Addis Ababa	RCC-Addis Ababa	Djibouti	RSC-Djibouti	JRSC	Operational 24/7
		Ethiopia	N/A	ARCC	Operational 24/7

SEARCH AND RESCUE REGION (SRR)	ASSOCIATED RCC	STATE WITH TERRITORY WITHIN THE SRR	ASSOCIATED RSC	UNIT TYPE	STATUS
Antananarivo	RCC-Antananarivo	Comoros	NIL	RSC not Established	Not Established
		Madagascar	N/A	JRCC	Operational 24/7
Asmara	RCC-Asmara	Eritrea	N/A	JRCC	Operational 24/7
Brazzaville	RCC-Brazzaville	Cameroon	RSC-Yaounde	ARSC	Operational 24/7
		Central African Republic	RSC-Bangui	ARSC	Operational 24/7
		Congo	N/A	ARCC	Operational 24/7
		Equatorial Guinea	NIL	RSC not Established	Not Established
		Gabon	RSC-Libreville	ARSC	Operational 24/7
		Sao Tome & Principe	NIL	RSC not Established	Not Established
Bujumbura	RCC-Bujumbura	Burundi	NIL	RSC not Established	Not Established
Cabo Verde	RCC-Cabo Verde	Cabo Verde	N/A	JRCC	Operational 24/7
Dakar	RCC-Dakar	Cote D'Ivoire	RSC-Abidjan	ARSC	Operational 24/7
		Gambia	RSC-Banjul	ARSC	Operational 24/7
		Guinea Bissau	NIL	RSC not Established	Not Established
		Mali	RSC-Bamako	ARSC	Operational 24/7
		Mauritania	RSC-Nouakchott	ARSC	Operational 24/7
		Senegal	N/A	ARCC	Operational 24/7
Dar es Salaam	RCC-Dar es Salaam	Tanzania	N/A	ARCC	Operational 24/7

SEARCH AND RESCUE REGION (SRR)	ASSOCIATED RCC	STATE WITH TERRITORY WITHIN THE SRR	ASSOCIATED RSC	UNIT TYPE	STATUS
Entebbe	RCC-Entebbe	Uganda	N/A	ARCC	Operational 24/7
Gaborone	RCC-Gaborone	Botswana	RSC- Maun	ARSC	Operational 24/7
			RSC- Kasane	ARSC	Operational 24/7
			RSC- Francistown	ARSC	Operational 24/7
Harare	RCC-Harare	Zimbabwe	N/A	ARCC	Operational 24/7
Johannesburg	RCC-Johannesburg	Eswatini	RSC-Kwauseni	ARSC	Operational 24/7
		Lesotho	RSC-Maseru	ARSC	Operational 24/7
		South Africa	N/A	ARCC	Operational 24/7
Kano	RCC-Kano	Nigeria	RSC-Lagos	JRSC	Operational 24/7
			RSC-Abuja	ARSC	Operational 24/7
Khartoum	RCC-Khartoum	South Sudan	N/A	RSC not established	Not Established
Kigali	RCC-Kigali	Rwanda	N/A	ARCC	Operational 24/7
Kinshasa	RCC-Kinshasa	Democratic Republic of the Congo	N/A	ARCC	Operational 24/7
Lilongwe	RCC-Lilongwe	Malawi	N/A	ARCC	Operational 24/7
Luanda	RCC-Luanda	Angola	N/A	ARCC	Operational 24/7
Lusaka	RCC-Lusaka	Zambia	N/A	ARCC	Operational 24/7
Maputo	RCC-Maputo	Mozambique	N/A	ARCC	Operational 24/7

SEARCH AND RESCUE REGION (SRR)	ASSOCIATED RCC	STATE WITH TERRITORY WITHIN THE SRR	ASSOCIATED RSC	UNIT TYPE	STATUS
Mauritius	RCC-Mauritius	Mauritius	N/A	ARCC	Operational 24/7
Mogadishu	RCC-Mogadishu	Somalia	N/A	ARCC	Operational 24/7
N'Djamena	RCC-N'Djamena	Cameroon	RSC-Yaounde	ARSC	Operational 24/7
		Central African Republic	RSC-Bangui	ARSC	Operational 24/7
		Chad	N/A	ARCC	Operational 24/7
Nairobi	RCC-Nairobi	Kenya	N/A	ARCC	Operational 24/7
Niamey	RCC-Niamey	Burkina Faso	RSC-Ouagadougou	ARSC	Operational 24/7
		Mali	RSC-Bamako	ARSC	Operational 24/7
		Niger	N/A	ARCC	Operational 24/7
Roberts	RCC-Roberts	Guinea	NIL	ARSC	Operational 24/7
		Liberia	NIL	ARCC	Operational 24/7
		Sierra Leone	RSC-Freetown	ARSC	Operational 24/7
Seychelles	RCC-Seychelles	Seychelles	N/A	JRCC	Operational 24/7
Windhoek	RCC-Windhoek	Namibia	N/A	ARCC	Operational 24/7

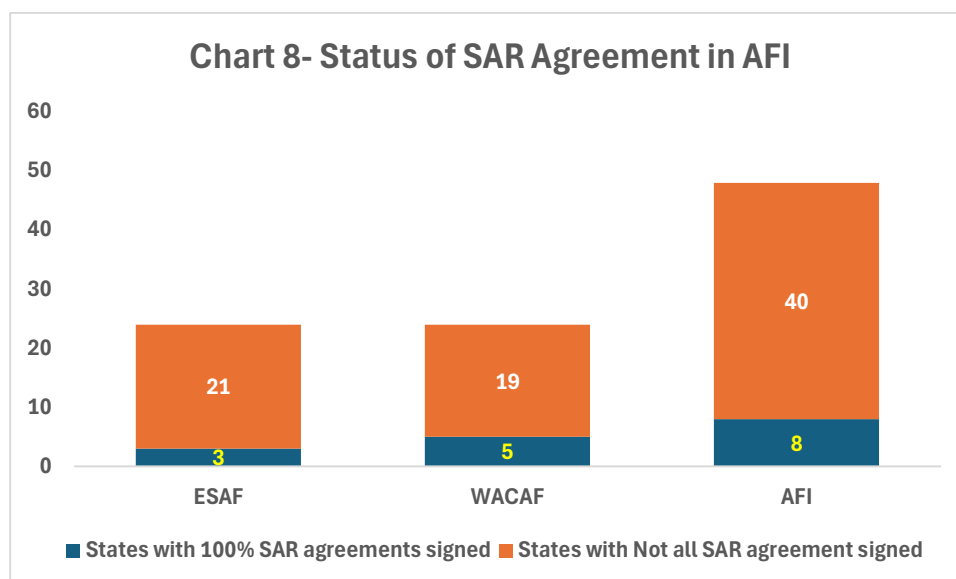


2.5.8 Chart 7 highlights that 42 out of 48 AFI States (87%) have established and operationalized the Search and rescue service within their territory and over areas for which they have accepted the responsibility for the provision of SAR including airspace over the high seas. This figure is a clear indication of the willingness and commitment of AFI States to provide an effective SAR service despite outstanding challenges such as low collaboration and cooperation, insufficient qualified workforce, limited resources etc. Regional initiatives are being undertaken to support the remaining six States and to enhance the State's oversight capability of SAR services and effective provision of SAR.

Status of SAR Agreements

2.5.9 Effective national and regional SAR implementation requires effective cross border coordination of search and rescue operations. This can only be effected through appropriate cooperation between States in accordance with article 25 of the convention of international civil aviation.

2.5.10 The status of SAR agreements signed between States, as depicted in chart 8, indicates that by 2024, only 8 States in AFI (21%) have concluded SAR agreements with all neighboring States. This includes 3 (13%) in ESAF and 5 in WACAF (5%).



2.5.11 The low status of SAR agreement signing in the AFI region represents one of the biggest challenges that calls for close attention from the relevant stakeholders and more specifically the decision-makers whose actions on SAR cooperation are critical.

2.5.12 Some regional initiatives such as high-level Briefings, seminars, as well as regional economic communities action plans on SAR are key strategies that can foster a timely resolution of the major deficiencies represented by lack of SAR agreements between States.

3. STATUS OF THE AFI AIR NAVIGATION PLAN

3.1. Status of information in the AFI eANP Volume I

AFI Air Navigation Plan (AFI ANP) Volume I and Volume II

- 3.1.1 The Twenty-seventh Meeting of the AFI Planning and Implementation Regional Group (APIRG/27) noted that few States had submitted contributions to the ICAO Regional Offices for the updating of the volumes I and II of the AFI ANP; and encouraged States to regularly review the content of the ANP and request amendments as necessary, to ensure data consistency and accuracy.
- 3.1.2 Based on the contributions received from States, the ICAO Regional Offices have consolidated the proposals for amendment (PfAs) to Volumes I and II of the ANP, in coordination with the States concerned. The approval process of the said PfAs is ongoing.
- 3.1.3 The status of implementation of the Regional Air Navigation Plan (Vol I and II) is provided in Appendix xx to this report.

AFI Air Navigation Plan (AFI ANP) Volume I and Volume II

- 3.1.4 Volume III of the AFI ANP focusses on the planning, implementation and monitoring of ASBU elements in the AFI Region. The meeting may recall that in view of facilitating data collection and monitoring of the planning and implementation of the ASBU elements identified as applicable in the region, the ASBU Tool of the AANDD platform was developed, as directed by the *APIRG/25 Conclusion 25/11*, and endorsed, through the *APIRG/27 Conclusion 27/16*, for use by States to consistently report on their planning and implementation of ASBU elements.
- 3.1.5 The second edition of the AFI Air Navigation Report provides an overview of the progress achieved in the implementation of ASBU elements in the AFI region as of December 2023. The overall implementation of ASBU in the AFI region stands at 42%, including 25% for Information Elements, 52% for Operational Elements and 50% for Technology Elements.
- 3.1.6 These figures may not depict the actual status of implementation of all ASBU elements applicable in the AFI region due to the lack of or insufficient data from States on ASBU implementation. The meeting may wish to encourage States to take the necessary steps, through their national committees called for by the *APIRG/27 Conclusion 27/17*, for regular reporting on the planning and implementation of ASBU elements. In this regards the Regional Offices may be urged to assist States in operationalizing their national committees.

National air navigation plans

3.1.7 The development of national plans constitutes the starting point for States in implementing regional plans. The meeting may recall that APIRG/27 welcomed an experience shared by Cameroon on the development of a National ASBU Plan and noted that less than 10% of the States in the AFI region had such a plan approved and available.

3.1.8 A specific template is intended to be provided as part of the online portal of the GANP to guide States in developing their national air navigation Plans.

4. AIR NAVIGATION DEFICIENCIES IN THE AFI REGION

4.1. The deficiencies versus findings: understanding the difference

4.1.1 In the context of air navigation and safety oversight, deficiencies and findings represent two distinct types of non-compliance:

- A **deficiency** refers to a situation where a facility, service or procedure does not comply with a Regional Air Navigation Plan approved by the Council, or with related ICAO Standards and Recommended Practices, and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.
- A **finding** is identified in a USOAP CMA activity as a result of a lack of compliance with Articles of the Convention, ICAO Assembly Resolutions, safety-related provisions in the Annexes to the Convention, Procedures for Air Navigation Services (PANS) or a lack of application of ICAO guidance material or good aviation safety practices.

4.1.2 The following table summarizes the key differences between deficiencies and findings across various aspects:

Table 16-Findings and deficiencies comparison

Aspect	Deficiency	Finding
Source	Identified through regional air navigation planning and operational reviews	Identified during USOAP CMA activities
Reference Framework	Regional Air Navigation Plans, ICAO SARPs	ICAO Convention, Assembly Resolutions, Annexes (safety-related provisions), PANS, guidance material
Impact	Affects safety, regularity, or efficiency of international civil aviation	Indicates lack of compliance with ICAO safety oversight provisions
Scope	Operational facilities, services, or procedures	Regulatory and safety oversight systems

Purpose	Highlights gaps in service delivery or infrastructure	Highlights gaps in regulatory compliance and safety practices
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4.2. Status of AOP deficiencies

4.2.1 There has been an improvement in the reporting of the Air Navigation deficiencies in the AFI Region in the AOP areas. By the end of August 2025, a total of 20 deficiencies have been reported in AGA area.

4.2.2 While this reflects an encouraging trend, further efforts are needed to strengthen the reporting culture and ensure comprehensive identification of deficiencies across all relevant areas.

4.3. Status of ATM/SAR deficiencies

4.3.1 AFI ATM/SAR stakeholders are increasingly showing interest in the reporting of air navigation deficiencies. In 2024, a total of five (05) air navigation deficiencies were reported through the Air navigation deficiencies database (AANDD) by four AFI States as compared to a total of one (01) recorded in 2023. The 2024 figure, although still low as compared to the level and complexity of aviation activities in AFI States, is encouraging thanks to the sensitization activities carried out ICAO regional offices through workshops and trainings. The following table summarizes the ATM/SAR deficiencies reported in 2024.

Table 17-AFI 2024 ATM/SAR Deficiencies and status

Deficiency number	Minimum reporting area	Date of reporting	Current status
0190-FN-ATM/SAR	ATM-Implementation of States Safety Plan (SSP)	12/2/2024	Active
0247-MRT-SAR	SAR-SAR Agreements	05/11/2024	Active
0248-MRT-SAR	SAR-SAR Agreements	05/11/2024	Active
0252-CMR-ATM	ATM-Implementation of Safety Management System (SMS)	15/12/2024	Active
0253-CMR-ATM	ATM-Implementation of RNAV/RNP terminal routes (CCO/CDO)	15/12/2024	Active

4.3.2 Coordination actions are undertaken between parties to timely address these active deficiencies through established mechanisms.

4.4. Status of CNS deficiencies

- 4.4.1 In As of 2024, no active CNS deficiencies have been recorded on the AANDD platform. States and organizations are encouraged to continue reporting air navigation deficiencies to support regional improvements in safety, efficiency, and service delivery.
- 4.4.2 To improve the reporting of air navigation deficiencies across all domains, APIRG has adopted a comprehensive list of Minimum Reporting Areas. This non-exhaustive list includes 44 key areas, covering the domains of Communication, Navigation, Surveillance, and Spectrum Management

4.5. Status of MET deficiencies

- 4.5.1 In the ESAF region, there is one deficiency recorded in the MET area on the AANDD. However, the region does have States with persistent Operational Meteorology (OPMET) availability challenges. States and Organizations are encouraged to report deficiencies.
- 4.5.2 Two (2) preliminary deficiencies in MET reported in two States were confirmed by the Regional Offices Committee Review, prompting the development of corrective action plans by the States.

4.6. Status of AIS deficiencies

- 4.6.1 Up to December 2024, a total of four (04) deficiencies were notified by States in the area of aeronautical information services.
- 4.6.2 From the deliberations of the Regional Offices deficiency review comity, two (02) deficiencies were deemed not relevant and two (02) were classified as preliminary deficiencies which therefore required remedial actions from the States concerned.

5. REGIONAL INITIATIVES AND BEST PRACTICES

5.1 States initiatives

Modernization of search and rescue facilities in Cameroon

5.1.1 In the framework of the implementation of Article 25 of the Chicago Convention, which obliges each Member State to provide such measures of assistance to aircraft in distress in its territory as it may find practicable, Cameroon has undertaken numerous projects aimed at establishing a rapid and efficient Search and Rescue (SAR) service.

5.1.2 Thus, in 2012, the Rescue subcenter (RSC) of Yaoundé, attached to the Rescue coordination centers (RCC) of Brazzaville and N'Djamena, officially started its activities in premises located at Air Base 101 in Yaoundé.

5.1.3 To meet the growing needs in search and rescue and improve the working conditions of staff, Cameroon has built a new reference RSC, allowing operation in accordance with ICAO standards, better suited to the activities of the Center, and equipped with modern facilities and equipment.

5.1.4 This new building was inaugurated on Tuesday, March 4, 2025, on the sidelines of the Regional Facilitation Forum, by the Minister of Transport of the Republic of Cameroon, in the presence of the Secretary General of ICAO, Mr. Juan Carlos Salazar, who expressed his satisfaction with this strategic investment and praised the efforts made by Cameroon to develop its aviation sector, essential for its economic future.

5.1.5 The RSC's main missions are:

- to initiate search and rescue operations for aircraft in distress;
- to ensure the management of SAR operations;
- to provide assistance to aircraft in distress;
- to ensure the coordination of rescue operations;
- to ensure that the available search and rescue intervention assets are sufficient and operational;
- to suspend or stop SAR operations after decision by the competent authorities;
- to prepare, organize and participate in national, regional or international exercises according to the established schedule.

5.1.6 The inauguration of the Rescue subcenter was an opportunity to celebrate a major project that will enable Cameroon's SAR service to fully play its role across Cameroonian and regional airspace.





Picture 1-Inaugural ceremony of the new RSC of Yaounde, Cameroon

Modernization of airport accessibility and infrastructure in Sierra Leone

5.1.7 Sierra Leone has engaged on a programme to modernize its aviation infrastructure and services through the effective collaboration in implementation of ADS-B stations in Roberts FIR, the design and implementation of PBN instrument flight procedures at Freetown international airport and the construction and operationalization of a new terminal building at Freetown International Airport.

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5.1.8 The design of new PBN procedures contributed to the improvement of flight safety, airspace capacity, airport accessibility and environmental protection around Freetown airport. This initiative also brings significant contributions to the progress of PBN related ASBU modules, B0-APTA and B1-APTA in the AFI region.

5.1.9 The building of a new airport terminal at Freetown international airport provided opportunities for enhancing the use of existing gates and stands (unlock latent capacity), reducing workload, reducing flight delay and fostering economic growth.





Picture 2 -New Freetown International Airport Terminal

SADIS API implementation in Nigeria

5.1.10 The meeting received an update on Nigeria's progress in migrating from SADIS FTP to the SADIS API. Nigeria has successfully operated SADIS FTP since 2012, delivering products to about twelve airports, and promptly initiated migration to the SADIS API following ICAO's call, supported by a workshop held in Dakar, Senegal. Key achievements reported include:

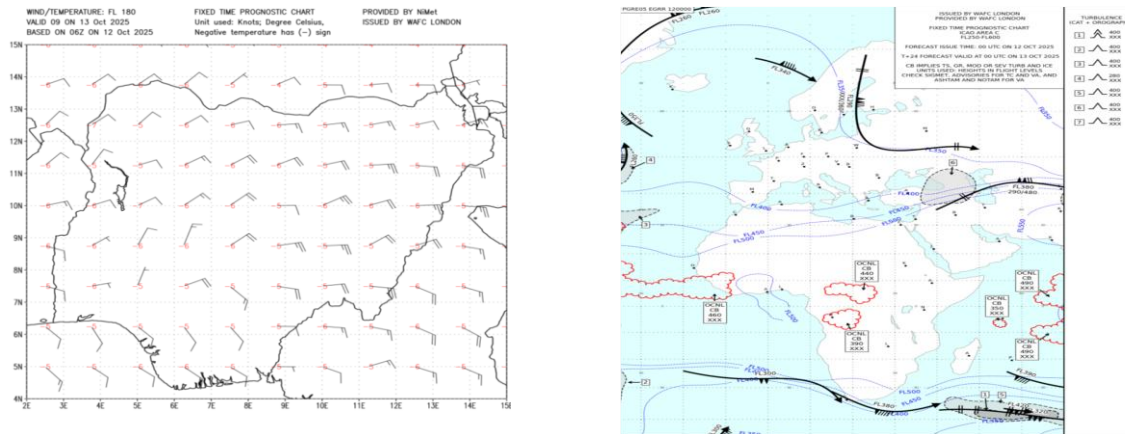
- Seamless registration with the SADIS Provider and access to WAFS
- Gridded, SIGWX and OPMET datasets at 0.25° resolution.
- Development of an automated workflow for retrieving, processing, and visualizing raw and IWXXM data.
- Establishment of a multidisciplinary SADIS team with strong leadership backing.
- Implementation of robust ICT infrastructure, including servers, cybersecurity, SSL encryption, interrogation tools, and visualization capabilities.
- Official operational launch of SADIS API on 27 August 2025, with resulting operational benefits such as centralized maintenance, easier updates, improved troubleshooting, and enhanced backup/disaster recovery.

5.1.11 Nigeria also shared key lessons learned, emphasizing the importance of early engagement with ICAO processes, strong interdisciplinary coordination, adequate ICT and cybersecurity

architecture, data-centric visualization tools, system automation, and centralized architecture for improved reliability and support.



Some outputs from SADIS API:



Picture 3-Output of the SADIS API Terminal of Nigeria

Airport Operators Initiatives

- 5.1.12 Airport operators use diverse initiatives to implement infrastructure and services, focusing on improvement of infrastructure and embracing new technology as well as ensuring sustainability. Public-private partnerships (PPPs) and digital transformation are key to managing these projects efficiently.

5.2 Air Navigation Service Providers initiatives

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ASECNA Airspace upgrade and optimization

Reclassification of TMAs and CTR

- 5.2.1 As part of the continuous improvement of Air Navigation Services, ASECNA has gradually transitioned from ATC procedural control to ATC surveillance using ATS surveillance systems, following more than a decade of operational deployment of radar and ADS-B surveillance capabilities.
- 5.2.2 In the terminal area (TMA) and Control zone (CTR) of ASECNA airspaces, the radar vectoring brought a new challenge in managing mixed mode operations involving IFR, under vectoring, and VFR within Class D airspace which increase operational complexity. Instances of VFR traffic interfering with IFR flight paths have highlighted limitations in maintaining adequate separation and situational awareness under current airspace classification.

- 5.2.3 In response to this new challenge and in order to harmonize air traffic services provisions with the adjacent airspaces in the region, ASECNA has undertook to upgrade TMAs and CTRs from class D to class C which became effective in May 2024. The implementation of this transition was conducted in compliance with change management process, and the appropriate publication has been made.

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AIRAC AIP SUP
NR 29/A/24GO
MARCH 22, 2024

BUREAU NOTAM INTERNATIONAL DE L'OUEST AFRICAIN
B.P. 8155 Aéroport International Blaise DIAGNE Dakar/Diass-SENEGAL

BENIN – BURKINA FASO – COTE D'IVOIRE – GUINEE BISSAU – MALI – MAURITANIE – NIGER – SENEGAL – TOGO

MISE EN ŒUVRE DE LA RECLASSIFICATION DES CTR ET TMA EN ESPACE AERIEN DE CLASSE C
IMPLEMENTATION OF THE RECLASSIFICATION OF CTR AND TMA INTO CLASS C AIRSPACE/

Mise en vigueur / Effective Date	16 mai 2024, May 16, 2024
Validité / Validity	PERM

Picture 4-Excerpt of AIP SUP for Upgrade of ASECNA TMA/CTR to C

Free Route Airspace

- 5.2.4 ASECNA has adopted a phased approach for the implementation of Free Route Airspace (FRA) in alignment with AFI FRA implementation Roadmap. This initiative was built upon the operational experience and efficiency gained using direct routing (DRO) operations during the COVID-19 pandemic. Close coordination with adjacent Air Traffic Service Unit was effective during all phase of the implementation ensuring smooth connectivity with the surrounding airspace and existing fixed ATS route network.
- 5.2.5 Since 25 January 2024, ASECNA has implemented local FRA which allows pilots to flight plan direct routing within ASECA airspaces. Following the successful implementation of the concept, the agency plans to conduct a structured user satisfaction survey to assess the operational impact and gather feedback from airspace users with the aim to evaluate perceived benefits in terms of flight efficiency, fuel saving and trajectory flexibility

6. PROGRESS STATUS OF ASBU IMPLEMENTATION IN AFI

6.1 2024 status in Information threads category

Table 18-2024 status in information threads category

Threads	Thread Title	ASBU Element Code	Element Title	Maturity level	Monitoring Status
AMET	Advanced Meteorological Information	AMET-B0/1	Meteorological observations products	Ready for implementation	Monitored
		AMET-B0/2	Meteorological forecast and warning products	Ready for implementation	Monitored
		AMET-B0/3	Climatological and historical meteorological products	Ready for implementation	Monitored
		AMET-B0/4	Dissemination of meteorological products	Ready for implementation	Monitored
		AMET-B1/1	Meteorological observations information	Standardization	Monitored
		AMET-B1/2	Meteorological forecast and warning information	Standardization	Monitored
		AMET-B1/3	Climatological and historical meteorological information	Standardization	Monitored
		AMET-B1/4	Dissemination of meteorological information	Standardization	Monitored

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TABLE 19-Implementation progress in Information Thread

Thread	2022	2023	2024	2025	Progress
AMET	18%	45%	48%		
DAIM	01%	18%			
FICE	15%	25%			

6.2 2024 status in operational threads category

6.2.1 Based on data available from State, the implementation status of ASBU elements in the operational threads category has substantially evolved from 2023 to 2024. The status is provided in the figure below, showing elements a slight progress in FRTTO thread due to the intensive free route airspace implementation activities undertaken in the region. APTA thread also evolved as the result of the implementation of CCO/CDO in some AFI States in 2024. The following table provides the status of ASBU implementation in the operational threads category:

TABLE 20-Implementation progress in Operational Threads

Thread	2023	2024	Progress
ACAS	100%	100%	+0%
ACDM	18.75%	18.75%	+0%
APTA	67%	68%	+1%
CSEP	Not monitored	Not monitored	
DATS	Not monitored	Not monitored	
FRTO	40%	41%	+1%
GADS	54%	54%	+0%
NOPS	Not monitored	Not monitored	
OFPL	Not monitored	Not monitored	
RSEQ	Not monitored	Not monitored	
SNET	68%	68%	+0%
SURF	Not monitored	Not monitored	
TBO	Not monitored	Not monitored	

6.3 2024 status in technology threads category

Table 21-Status of implementation in technology threads category

Thread	Thread Title	Element Code	Element Title	Maturity Level	Monitoring Status
ASUR	Surveillance systems	ASUR-B0/1	Automatic Dependent Surveillance - Broadcast (ADS-B)	Ready for implementation	Monitored
		ASUR-B0/2	Multi-lateration cooperative surveillance systems (MLAT)	Ready for implementation	Monitored
		ASUR-B0/3	Cooperative Surveillance Radar Downlink of aircraft Parameters (SSR-DAPS)	Ready for implementation	Monitored
		ASUR-B1/1	Reception of aircraft ADS-B signals from space (SB ADS-B)	Ready for implementation	Monitored
		ASUR-B2/1	Evolution of ADS-B and Mode S	Validation	Not Monitored
COMI	Communication infrastructure	COMI-B0/1	Aircraft Communication Addressing Reporting System (ACARS)	Ready for implementation	Monitored
		COMI-B0/2	Aeronautical Telecommunication Network/Open System	Ready for implementation	Monitored
		COMI-B0/3	VHF Data Link (VDL) Mode O/A	Ready for implementation	Monitored
		COMI-B0/4	VHF Data Link (VDL) Mode 2 Basic	Ready for implementation	Monitored
		COMI-B0/5	Satellite Communication (SATCOM) Class C Data	Ready for implementation	Monitored
		COMI-B0/6	High Frequency Data Link (HF DL)	Ready for implementation	Monitored
		COMI-B0/7	ATS Message Handling System (AMHS)	Ready for implementation	Monitored
		COMI-B1/1	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol suite (ATN/IPS)	Standardization	Monitored
		COMI-B1/2	VHF Data Link (VDL) Mode 2 Multi-Frequency	Ready for implementation	Monitored
		COMI-B1/3	SATCOM Class B Voice and Data	Ready for implementation	Monitored

Thread	Thread Title	Element Code	Element Title	Maturity Level	Monitoring Status
		COMI-B1/4	Aeronautical Mobile Airport Communication System (AeroMACS)	Ready for implementation	Monitored
		COMI-B2/1	Air-Ground ATN/IPS	Validation	Not Monitored
		COMI-B2/2	AeroMACS aircraft mobile connection	Validation	Not Monitored
		COMI-B2/3	Link meeting requirements for non-safety critical communication	Validation	Not Monitored
CO	ATS Communication service	COMS-B0/1	CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace	Ready for implementation	Monitored
		COMS-B0/2	ADS-C (FANS 1/A) for procedural airspace	Ready for implementation	Monitored
		COMS-B1/1	PBCS approved CPDLC (FANS 1/A +) for domestic and procedural airspace	Ready for implementation	Monitored
		COMS-B1/2	PBCS approved ADS-C (FANS 1/A +) for procedural airspace	Ready for implementation	Monitored
		COMS-B1/3	SATVOICE (incl. routine communication) for procedural airspace	Ready for implementation	Monitored
		COMS-B2/1	PBCS approved CPDLC (B2) for domestic and procedural airspace	Validation	Not Monitored
		COMS-B2/2	PBCS approved ADS-C (B2) for domestic and procedural airspace	Validation	Not Monitored
		COMS-B2/3	PBCS approved SATVOICE (incl. routine communications) for procedural airspace	Validation	Not Monitored
NAVS	Navigation systems	NAVS-B0/1	Ground Based Augmentation System (GBAS)	Ready for implementation	Monitored
		NAVS-B0/2	Satellite Based Augmentation System (SBAS)	Ready for implementation	Monitored
		NAVS-B0/3	Aircraft Based Augmentation system (ABAS)	Ready for implementation	Monitored
		NAVS-B0/4	Navigation Minimal Operating Networks (Nav. MON)	Ready for implementation	Monitored
		NAVS-B1/1	Extended GBAS	Standardization	Monitored
		NAVS-B2/1	Dual frequency Multi Constellation (DFMC) GBAS	Validation	Not Monitored
		NAVS-B2/2	Dual frequency Multi Constellation (DFMC) SBAS	Validation	Not Monitored
		NAVS-B2/3	Dual frequency Multi Constellation (DFMC) ABAS	Validation	Not Monitored

7. IMPLEMENTATION CHALLENGES IN THE AFI REGION

7.1 Implementation challenges in essential airport services and infrastructure

7.1.1 The implementation of essential airport services and infrastructure faces a range of challenges, including complex stakeholder management, substantial funding requirements for the integration of advanced technology into existing operational systems. These issues affect critical areas such as airport operations, ground handling, and terminal building upgrades.

7.1.2 Key challenges include:

- Complex stakeholder coordination,
- Cost overruns and budget control,
- Maintaining operational continuity during expansion,
- Environmental sustainability and
- Supply chain disruptions.

7.1.3 In addition, specific issues such as outdated infrastructure, integration of new technologies, staffing shortages and training needs, and Cybersecurity threats further complicate implementation efforts.

7.1.4 While many of these challenges are specific to airport operations, ground handling also faces distinct difficulties, including:

- Lack of standardization,
- Pressure for rapid aircraft turnarounds and
- Resource and infrastructure limitations.

7.2 Implementation challenges in essential airspace operations and infrastructure

7.2.1 The AFI Region continues to face several challenges in the implementation of essential airspace operations and infrastructure, which impact the efficiency, safety, and resilience of air navigation services. Key issues include:

GNSS interference and navigation infrastructure

7.2.2 The AFI Region continues to face safety concerns due to radio frequency interference (RFI) affecting GNSS-based navigation systems. In response, APIRG is reconsidering the decommissioning of conventional ground-based navigation aids such as VOR, VOR/DME, NDB, and ILS, which remain essential for operational continuity.

7.2.3 Radio navigation workshops addressing GNSS RFI have¹⁴¹ been conducted in various regions and serve as a platform to develop an AFI Regional GNSS RFI reporting procedure, based on ICAO guidelines and recommendations. One such workshop is planned for the AFI Region.

Cybersecurity Threats to Air Navigation Services

7.2.4 The AFI Region has identified a range of cybersecurity threats targeting Air Navigation Services (ANS). In response, a Cyber Safety and Resilience Framework has been developed to support States and organizations in assessing cybersecurity risks, threats, and vulnerabilities. This framework provides structured guidelines for mitigating risks and strengthening the resilience of ANS infrastructure.

7.2.5 To raise awareness and enhance preparedness, ICAO and regional partners have organized webinars and workshops, with further sessions planned. These initiatives aim to build capacity

across the region in identifying, protecting against, detecting, responding to, and recovering from cyber threats, while also promoting the exchange of best practices among stakeholders.

Human resources

- 7.2.6 Limited human resources continue to affect the implementation of essential airspace operations in the AFI Region. States face challenges in recruiting and retaining qualified personnel, maintaining technical expertise, and ensuring continuity due to high staff turnover. Workforce stability remains critical, and States are encouraged to assess related risks when planning implementation strategies.

8. CONCLUSION PART 2

- 8.1 This third Edition of the annual air navigation report has provided the opportunity for an in depth look at the AFI air navigation system from different perspectives such as the progress in the lay down of foundational services and facilities also known as the BBBs, as well as efforts made by AFI States and the industry in progressing the modernization of infrastructure and services as guided by the ASBU framework.
- 8.2 Data and information collected from various sources and consolidated have shown significant progress in the AFI region in the implementation of BBBs and ASBU through major national and regional projects in AGA, AIS, ATM, CNS, MET and SAR.
- 8.3 While progress observed is commendable, the deficiencies reporting and resolution in Air navigation remain a challenge that calls for more efforts from States in fulfilment of their obligations with regard to article 28 of the Chicago Convention.
- 8.4 Regional projects and initiatives represent a synergetic response to the current challenges to ensure harmonized and balance implementation while supporting the ICAO goal “no country left behind”.

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