

# **AFI Air Navigation Report (AANR)**

## **Appendices**

**First Edition, November 2023**

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## APPENDIX 1 – REVISED ABUJA SAFETY TARGETS

### 1.1. Abuja Safety and Air Navigation Targets

#### 1.1.1. Revised Abuja Safety Targets incorporating AFI Air Navigation Services Performance Indicators (ANS PIs); and the status of their implementation for all the 48 RASG-AFI States

Revised Abuja Safety Target	Assessments	Status of Implementation
<p>1. Progressively reduce the African accident rate from 8.6 to 2.5 per million departures by the end of 2022, with focus on:</p> <ul style="list-style-type: none"> <li>▪ Runway related accidents and serious incidents (Runway Excursion, RE).</li> <li>▪ Controlled flight into terrain (CFIT) related accidents and serious incidents.</li> <li>▪ Loss of Control In-flight (LOC-I) related accidents and serious incidents.</li> <li>▪ Achieve and maintain zero fatalities in aircraft accidents.</li> </ul>	<p>The accident rate decreased from 10.34 in 2019 to 6.7 in 2021.</p> <ul style="list-style-type: none"> <li>▪ Runway related accidents and serious incidents (Runway Excursion, RE) continue to record a higher rate than the other HRCs.</li> <li>▪ CFIT related Accidents and serious Incidents rate remained at Zero from 2015 to 2021.</li> <li>▪ LOC-I related accidents and serious incidents had Zero rate in 2021.</li> <li>▪ Number of fatalities decreased from 20 in 2020 to Zero in 2021</li> </ul> <p><i>(Source:- ICAO iSTARS)</i></p>	<p>Although there was an overall decrease in accident rate and fatalities in 2021 compared to the same period in 2020, this may be attributed to the drastic reduction in the volume of traffic due to the impact of COVID-19 pandemic. Notwithstanding, more efforts need to be put in place to continue to maintain a downward trend if the target for 2022 is to be achieved.</p>
<p>2. All States establish and strengthen autonomous Civil Aviation Authorities with independent regulatory oversight, sustainable sources of funding and resources to carry out effective safety oversight and regulation of the aviation industry by 2022.</p> <ul style="list-style-type: none"> <li>▪ States that need support in areas with safety margins below zero, to use a regional safety oversight organizations or another State’s ICAO-recognized functions by 2020.</li> <li>▪ States effectively exercise the safety oversight functions with a positive safety margin in all areas by 2022.</li> </ul>	<p>At least the 28 States that have attained the 60 per cent EI Target, amongst the 46 audited RASG-AFI States, are effectively autonomous.</p> <p><i>(Source: ICAO iSTARS)</i></p>	<p>AFCAC to encourage more States, through high level State visits, to establish autonomous CAAs with independent regulatory oversight and sustainable sources of funding.</p>

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Revised Abuja Safety Target	Assessments	Status of Implementation
<ul style="list-style-type: none"> <li>▪ States to delegate certain safety oversight functions to RSOOs or other States, by the end of 2022 in areas with safety margins below zero, and as appropriate.</li> </ul>		
<p>3. States resolve:</p> <ul style="list-style-type: none"> <li>▪ Existing SSCs by June 2018;</li> <li>▪ Newly identified SSCs within 6 months from the date of its official publication by ICAO.</li> </ul>	<p>Statistics from 2012 to 2021:</p> <ul style="list-style-type: none"> <li>▪ 22 SSCs found in 15 States;</li> <li>▪ 21 resolved in 14 States.</li> <li>▪ 1 SSC still exist in one State. SSC exceeded 12-month deadline.</li> </ul>	<p><b>Target not met</b></p>
<p>4. States abide by the timelines and provide resources for implementation of ICAO/State Plans of Action</p> <ul style="list-style-type: none"> <li>▪ All States to have accepted ICAO Plans of Action by 2019 and</li> <li>▪ abide by the timelines and provide resources for their implementation.</li> </ul>	<p>37 States have accepted ICAO Plans of Action and are at different stages of implementation (Source: AFI Plan)</p>	<p>Data collected was insufficient to determine level of implementation of the 37 ICAO/ State Plans of Action.</p>
<p>5. States progressively increase the Effective Implementation (EI) percentage under the ICAO USOAP such that States with:</p> <ul style="list-style-type: none"> <li>▪ EI &lt; 60% attain 60% by 2020;</li> <li>▪ 60% ≤ EI ≤ 70% attain 80% by 2022;</li> <li>▪ 70% &lt; EI attain 95% by 2028.</li> </ul>	<p>By December 2021, only 59.62% of the AFI member States had reached the target of 60% EI and the group of States have an average EI of 57.82%. This is 1.18% increase compared to year 2020 performance.</p>	<p><b>Target not met</b> (EI &lt; 60% attain 60 per cent by 2020).</p> <p>Number of AFI States with EI of 60 per cent and greater has increased significantly from 15 in 2014 to 33 by December 2021. The efforts of ICAO and AFCAC should be intensified to accelerate the implementation of the CAPs.</p>
<p>6. For the purposes of SSP/SMS Implementation, all States:</p> <ul style="list-style-type: none"> <li>▪ to have a Foundation SSP established, addressing all pre-requisites;</li> </ul>	<ul style="list-style-type: none"> <li>▪ By December 2021, at least 24 RASG-AFI States initiated SSP implementation with One State (Rwanda) attaining Level 4. None of the States contributed information on safety risks to RASG-AFI. (Source: ICAO iSTARS)</li> </ul>	<p><b>Target not met</b></p> <p>Goal 3.1 of the 2020 – 2022 Edition of the GASP requires all States to implement the foundation of an SSP by 2022. Therefore, the ICAO Regional Offices (ESAF/WACAF) had incorporated SSP Implementation Assistance to States in their work programme, which includes review of the SSP Foundation Protocol Questions (PQs). The AFI</p>

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Revised Abuja Safety Target	Assessments	Status of Implementation
<ul style="list-style-type: none"> <li>▪ to have an Effective SSP with appropriate maturity level established;</li> <li>▪ to contribute information on safety risks, including SSP SPIs, to the RASG-AFI;</li> <li>▪ with a positive safety margin, and an Effective SSP, to actively engage in RASG-AFI safety risk management activities (analysis of safety risks, design and implementation of risk mitigation actions).</li> </ul> <p>All Service Providers to use globally harmonized SPIs as part of their SMS.</p>		<p>Plan Project on SSP Implementation by States should be broadened to include all RASG-AFI States and not just States with 60% EI and greater.</p>
<p>7. All International Aerodromes to be certified by 2022,</p> <ul style="list-style-type: none"> <li>• At least one international aerodrome in every State to be certified by end of 2020;</li> <li>• All airport operators to participate in the ICAO-recognized industry assessment programme for airports (APEX) by end of 2022;</li> <li>• At least one international aerodrome in every State to establish a Runway Safety Team (RST) by end of 2020.</li> </ul>	<p>As at 31 December 2021, 41 International Aerodromes were certified out of 126 within RASG-AFI States (32.54 per cent).</p> <p><i>(Source: ICAO ISTARs -2021)</i></p> <ul style="list-style-type: none"> <li>• 24 out of 48 RASG-AFI States certified at least one international aerodrome.</li> <li>• 50 airports out of 126 received an APEX review</li> <li>• 38 aerodrome out of 126 established RSTs.</li> </ul> <p><i>(Source: ICAO ISTARs -2021)</i></p>	<p><b>Target not met</b> (At least one international aerodrome in every State to be certified by end of 2020).</p> <p>From the responses to the questionnaire, aerodrome certification is still a serious challenge for AFI States. However, almost all AFI States indicated that the process of certification of international aerodromes is in progress.</p>

Revised Abuja Safety Target	Assessments	Status of Implementation
<p>8. Require all African airlines to obtain an IATA Operational Safety Audit (IOSA) certification:</p> <ul style="list-style-type: none"> <li>▪ All States to establish an appropriate framework for recognition of IATA operational safety audit (IOSA) and IATA Standard Safety Assessment (ISSA) as effective safety mechanisms; All African airlines to obtain IOSA or ISSA certification, as appropriate, by the end of 2022.</li> </ul>	<p>From a total of 20 airlines on the IOSA Registry in 2012 there were 41 airlines on the Registry by end of December 2021.</p> <p>Percentage of States with IOSA certified airlines increased to 41.87%</p> <p><i>(Source: IATA)</i></p>	<p>Interventions through AfDB Project Implementation Agreement (PIA) for SAATM member States will assist some airlines to meet the target.</p> <p>There is a need for distinction between the establishment of an appropriate framework by States for recognition of IATA operational safety audit (IOSA) and IATA Standard Safety Assessment (ISSA) as effective safety mechanisms, and IOSA registration.</p>
Air Navigation (ANS) Target	Status of Implementation	Recommendations
<p>9. All States to establish an effective and operational SAR organization:</p> <ul style="list-style-type: none"> <li>• Development of a National SAR Plan by end of 2018;</li> <li>• Conclusion of SAR Agreements/ MoUs with all neighboring States by end of 2018;</li> <li>• Organisation of multi-agency, multi-State and combined Regional SAR exercises to test SAR systems in place involving as many SAR units as practicable by end of 2019.</li> </ul>	<ul style="list-style-type: none"> <li>• Based on data collected as part of AFI Plan project, 25 SAR agreements have been signed between States and 35 new Draft agreements have been developed to either supersede old agreements or formalised cooperation where this has been lacking.</li> <li>• Eight (8) States have developed National SAR Plans and two (2) States have draft National SAR Plans in place.</li> </ul> <p><i>(Source: ICAO ISTARs -2021)</i></p>	<p><b>Target not met.</b></p> <p>States are progressively developing SAR Plans, though at a slow pace.</p>
<p>10. All States to implement the transition from AIS to AIM:</p> <ul style="list-style-type: none"> <li>• Development of a National Action Plan By end of 2018;</li> <li>• Implementation of the National Action Plan in accordance with the ASBU Block 0 D-ATM by end of 2020.</li> </ul>	<ul style="list-style-type: none"> <li>• 36 per cent of States have fully completed Phase 1 Consolidation;</li> <li>• 44 per cent have partially accomplished Phase 2 Going Digital.</li> </ul>	<p><b>No comprehensive data available.</b></p> <ul style="list-style-type: none"> <li>• There is need to establish and promote sufficient data collection tools;</li> <li>• Effective coordination among key stakeholders and appropriate regional master</li> </ul>

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Revised Abuja Safety Target	Assessments	Status of Implementation																																														
	<i>(Source: ICAO ISTARs -2021)</i>	plans/ interventions are required to ensure effective implementation of this target. •																																														
Air Navigation (ANS) Target	Status of Implementation	Recommendations																																														
<p>11. All States to implement PBN procedures for all instrument runways.</p> <ul style="list-style-type: none"> <li>75% of Instrument Runways to have PBN procedures by end of 2020;</li> <li>100% of Instrument Runways to have PBN Procedures by end of 2025.</li> </ul>	<p><b>National PBN Implementation Plans (NPIPs) status</b></p> <table border="0"> <tr> <td>Reg. Office/Region</td> <td># States</td> <td># NPIPs</td> </tr> <tr> <td>ESAF</td> <td>24</td> <td>17 (71%)</td> </tr> <tr> <td>WACAF</td> <td></td> <td>24 22 (92%)</td> </tr> <tr> <td>AFI Region</td> <td>48</td> <td>38 (81%)</td> </tr> </table> <table border="0"> <tr> <td>Year</td> <td>WACAF</td> <td>ESAF</td> <td>AFI</td> </tr> <tr> <td>2014</td> <td>17%</td> <td>42%</td> <td>29%</td> </tr> <tr> <td>2018</td> <td>92%</td> <td>63%</td> <td>77%</td> </tr> <tr> <td>2020</td> <td>92%</td> <td>71%</td> <td>81%</td> </tr> <tr> <td>2022</td> <td>92%</td> <td>71%</td> <td>81%</td> </tr> </table> <p><b>Instrument Runways Status for AFI Region</b></p> <table border="0"> <tr> <td># Instr. RWY</td> <td>248</td> </tr> <tr> <td># RNP APRCH</td> <td>173</td> </tr> <tr> <td># BARO VNAV</td> <td>131</td> </tr> <tr> <td># SID</td> <td>85</td> </tr> <tr> <td># CCO</td> <td>26</td> </tr> <tr> <td># STAR</td> <td>117</td> </tr> <tr> <td># CDO</td> <td>28</td> </tr> </table> <p><i>(Source – ICAO ISTARs -2021)</i></p>	Reg. Office/Region	# States	# NPIPs	ESAF	24	17 (71%)	WACAF		24 22 (92%)	AFI Region	48	38 (81%)	Year	WACAF	ESAF	AFI	2014	17%	42%	29%	2018	92%	63%	77%	2020	92%	71%	81%	2022	92%	71%	81%	# Instr. RWY	248	# RNP APRCH	173	# BARO VNAV	131	# SID	85	# CCO	26	# STAR	117	# CDO	28	<p>Although group average is high, a number of States have not initiated PBN procedures for their instrument runways. There is need for effective coordination among key stakeholders and appropriate regional interventions are required to ensure effective implementation of this target.</p>
Reg. Office/Region	# States	# NPIPs																																														
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<p>12. All States to progressively reduce the rate of aircraft proximity (AIRPROX) occurrences in their managed airspaces by at least 50% annually from Dec. 2017 baseline, in order to attain and maintain a level of zero (0) AIRPROX by correspondingly reducing errors in the following contributing factors:</p> <ul style="list-style-type: none"> <li>Co-ordination between ATS Units (50%);</li> </ul>	<p>No comprehensive data to establish level of implementation.</p>	<p><b>Target: 2023</b></p> <p>So far, no comprehensive data available.</p> <p>There is need to establish and promote sufficient data collection tools.</p>																																														

Revised Abuja Safety Target	Assessments	Status of Implementation
<ul style="list-style-type: none"> <li>• Airspace Organization and ATC Procedures (50%);</li> <li>• Mobile Communications (50%)</li> <li>• Poor Crew Discipline on board aircraft (50%)</li> </ul>		
Air Navigation (ANS) Target	Status of Implementation	Recommendations
<p>13. Establishment of seamless Air Navigation Services in the AFI Region:</p> <p>a) All States to ensure provision of harmonized Air Navigation Services in terms of flight separation, interoperability of CNS/ATM systems to reduce airspace complexity and achieve seamless operations along major air traffic flows.</p> <p>b) Various initiatives formulated by the Regional Economic Communities (RECs) and ANSPs within the AFI Region to be harmonized.</p>	<p>Activities towards integration of the AFI Region towards seamless ANSPs is anticipated through RECs. AFCAC established the ANSPs Platform which will discuss among other things establishment of a seamless air navigation services in the AFI Region including establishment of a continental ANS infrastructure gap analysis.</p>	<p><b>Target: 2024</b></p> <p>There is need for appropriate regional master plans/ interventions to ensure effective implementation of this target.</p>
<p>14. All States to implement ASBU B0 Modules:</p> <ul style="list-style-type: none"> <li>• All States to develop National ASBU Plan by end of 2018.</li> </ul>	<p>IATA ASBU Tracker indicate that:</p> <ul style="list-style-type: none"> <li>▪ Total percentage of RNAV GNSS APRCH was 63 per cent for ESAF and 79 per cent for WACAF;</li> <li>▪ Total percentage of RNAV SID was 40 per cent for ESAF and 20 per cent for WACAF;</li> <li>▪ Total percentage of RNAV STAR was 40 per cent ESAF and WACAF 46 per cent.</li> </ul> <p>(Source - ICAO/ IATA)</p>	<p><b>Target not met</b></p> <p>Comprehensive information on current Status of ASBU implementation in AFI Region was not available.</p> <ul style="list-style-type: none"> <li>• There is need to establish and promote sufficient data collection tools;</li> <li>• There is need for appropriate regional master plans/ interventions to ensure effective implementation of this target.</li> </ul>

Revised Abuja Safety Target	Assessments	Status of Implementation
<p>15. All States to develop and implement a National Plan for the reduction of CO<sub>2</sub> emissions due to international civil aviation:</p> <ul style="list-style-type: none"> <li>• develop a National Plan for CO<sub>2</sub> reduction by end of 2020;</li> <li>• full implementation of the National Plan by 2022.</li> </ul>	<p>25 States in AFI Region have developed and submitted to ICAO, National Plans for the reduction of CO<sub>2</sub> emissions.</p> <p>10 States are receiving assistance under Phase II of the ICAO assistance project, funded by the European Union (EU), on Capacity Building for the Mitigation of CO<sub>2</sub> Emissions from International Aviation.</p> <p><i>(Source – ICAO)</i></p>	<p>States need to be encouraged to develop or update their Action Plans using the guidance in the ICAO Doc 9988.</p>
<p>16. All States ensure that their ANSPs effectively participate in the African ANSP Peer Review Programme by:</p> <ul style="list-style-type: none"> <li>• Joining the programme and having in place, an annual Peer Review plan of activities.</li> <li>• Develop and implement appropriate corrective action plans to satisfactorily address Peer Review recommendations.</li> </ul>	<p>Membership has continued to grow with current participation including: CANSO members (all 18 ASECNA member States, South Africa, 3 Robert FIR States, Uganda, Mozambique, Zambia, Algeria etc).</p> <p><i>(Source – ICAO)</i></p>	<p>More States need to be encouraged to join the ANSP Peer Review Programme in order to meet the 2022 target.</p>

## ***APPENDIX 2 – LIST OF STATES AND FIRS ACCREDITED TO ARMA***

### ***Scope of responsibility of the ARMA***

*Table 9 - AFI States accredited to ARMA*

	Angola	Benin	Botswana
Burkina Faso	Burundi	Cameroon	Congo
Central African Rep.	Chad	Comoros	Côte d’Ivoire
Eritrea	Djibouti	DR Congo	Equatorial Guinea
Guinea Bissau	Ethiopia	Gabon	Ghana
Liberia	Guinea	Kenya	Lesotho
Mali	Mauritania	Madagascar	Malawi
Namibia	Niger	Mauritius	Mozambique
Rwanda	Sao Tome & Principe	Nigeria	
Sierra Leone	Somalia	Senegal	Seychelles
Eswatini	United Republic of Tanzania	South Africa	Togo
		The Gambia	Uganda
Zambia	Zimbabwe	Guinea Bissau	

Table 10 - AFI FIRs

Accra	Addis Ababa		Antananarivo
Asmara	Beira	Brazzaville	Cape Town
Dakar	Dar es Salaam	Entebbe	Gaborone
Harare	Johannesburg	Johannesburg Oceanic	Kano
	Kinshasa	Lilongwe	Luanda
Lusaka	Mauritius	Mogadishu	Nairobi
N'Djamena	Niamey	Roberts	Seychelles
	Windhoek		

## APPENDIX 3 – ARMA GUIDELINES TO STATES



### Guidelines on how to fill the ARMA F2 Form

1. Enter the two letter ICAO identifier as contained in **ICAO Doc 7910**.
2. Enter the operator's 3 letter ICAO identifier as contained in **ICAO Doc 8585**. For International General Aviation, enter "YYY" (write the name of the operator/ owner in the Remarks 14 field).
3. Enter the two letter ICAO identifier as contained in **ICAO Doc 7910**.
4. Enter the ICAO designator as contained in **ICAO Doc 8643**, e.g., for Airbus A320-211, enter A322; for Boeing B747-438 enter B744.
5. Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.
6. Enter aircraft serial number as given by manufacturer.
7. Enter aircraft's current registration number.
8. Enter ICAO allocated Aircraft Mode S address code, in HEX.  

0	0	A	0	0	1
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9. Enter **YES** or **NO** indication of airworthiness approval.  

Y	E	S
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10. Enter date of airworthiness approval. Example: For October 26, 2008 write:  

2	6	1	0	0	8
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11. Enter yes or no indication of RVSM approval.  

Y	E	S
---	---	---
12. Enter date of RVSM approval. Enter date as shown in 10
13. Enter date of expiry for RVSM approval. Enter date as shown in 10
14. Enter **YES** or **NO** indication of PBCS approval. As shown in 9

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15. Enter date of PBCS approval. Enter date as shown in 10
16. Enter date of RCP240 authorization. Enter date as shown in 10
17. Enter date of RSP180 authorization. Enter date as shown in 10
18. Enter date of expiry for PBCS approval. Enter date as shown in 10
19. Fill in if necessary. Use a separate sheet of paper if insufficient space available.

### Guidelines on how to fill the ARMA F3 Form

1. Enter the two letter ICAO identifier as contained in *ICAO Doc 7910*.
2. Enter the operator's 3 letter ICAO identifier as contained in ICAO Doc 8585. For International General Aviation, enter "YYY" (write the name of the operator/ owner in the Remarks 11 field). For military aircraft, enter "MIL".
3. Enter the two letter ICAO identifier as contained in *ICAO Doc 7910*.
4. Enter the ICAO designator as contained in *ICAO Doc 8643*, e.g., for Airbus A320-211, enter A322; for Boeing B747-438 enter B744.
5. Enter series of aircraft type or manufacturer's customer designation, e.g., for Airbus A320-211, enter 211; for Boeing B747-438, enter 400 or 438.
6. Enter aircraft serial number as given by manufacturer.
7. Enter aircraft's current registration number.
8. Enter ICAO allocated Aircraft Mode S address code.
9. Enter date of withdrawal of RVSM approval. Example: For October 26, 2008 write
10. Enter the reason of withdrawal of RVSM approval.
11. Enter date of withdrawal of RCP240/RSP180/PBCS approval. As shown in 9
12. Enter the reason of withdrawal of RCP240/RSP180/PBCS approval.
13. Fill in if necessary. Use a separate sheet of paper if insufficient space available.

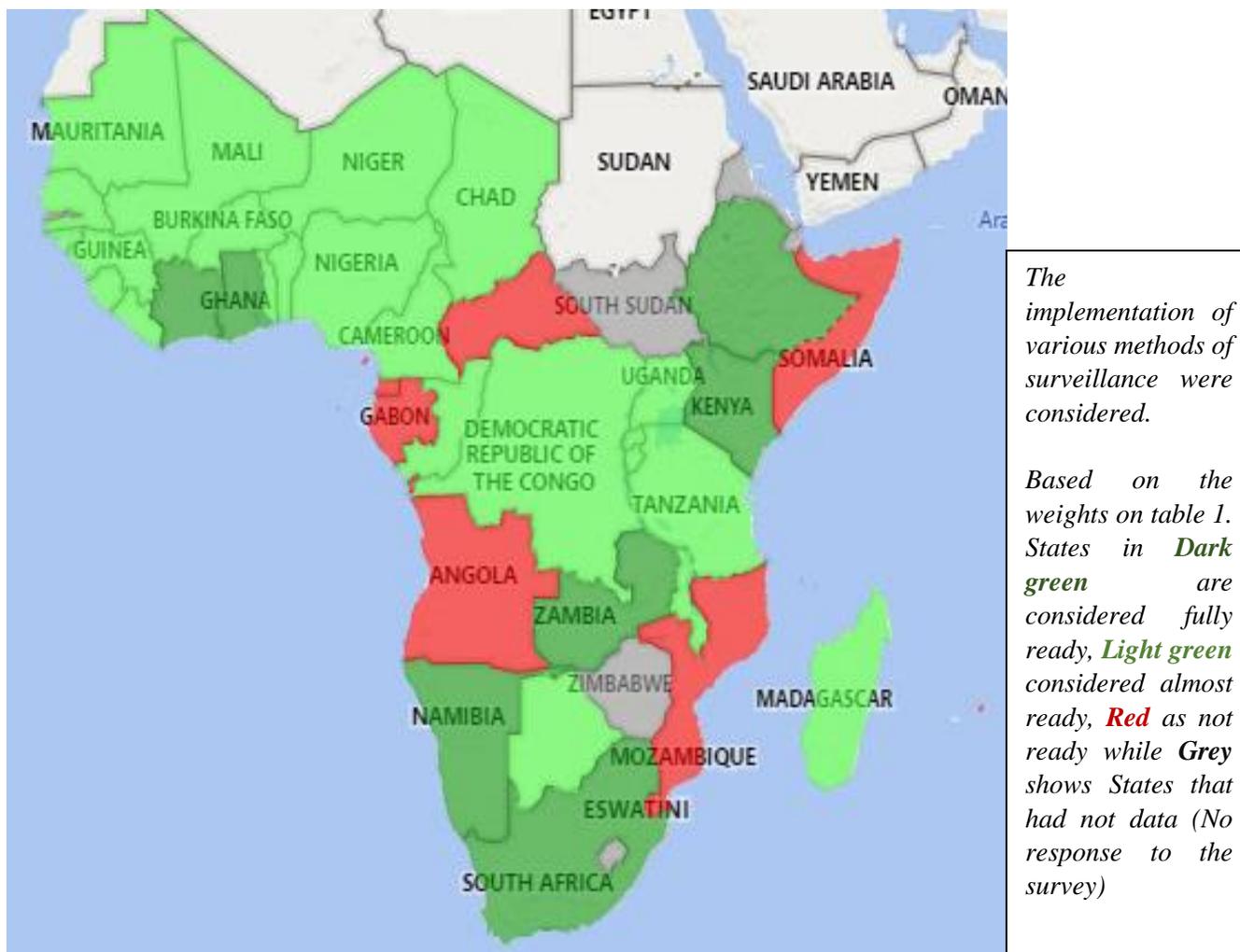
## ***APPENDIX 4      AFI FREE ROUTE AIRSPACE (FRA) GAP ANALYSIS REPORT***

### **AFI region presentation of results**

The gap analysis revealed the level of preparedness of the AFI states in implementing FRA. The results of the gap analysis and the CONOPS were shared with states during the first AFI FRA workshop held on 6-7 July 2022. Whereas some States are considered to be fully ready for FRA implementation, some have already implemented FRA within their FIR while others are considered almost ready with a few considered not ready.

The maps below depict the level of preparedness for the AFI region based on each of the focus areas:

Map 3 – FRA Surveillance



Map 4 - Communication



*The implementation of various methods of Communication were considered.*

*Based on the weights on table 1. States in **Dark green** are considered fully ready, **Light green** considered almost ready while **Grey** shows States that had not data (No response to the survey)*

Map 5 - Coordination



*The implementation of various methods of coordination were considered.*

*Based on the weights on table 1. States in **Dark green** are considered fully ready, **Light green** considered almost ready, while **Grey** shows States that had not data (No response to the survey)*

Map 6 - Navigation



*The implementation of various methods of navigation were considered.*

*Based on the weights on table 1. States in **Dark green** are considered fully ready, **Light green** considered almost ready, while **Grey** shows States that had not data (No response to the survey)*

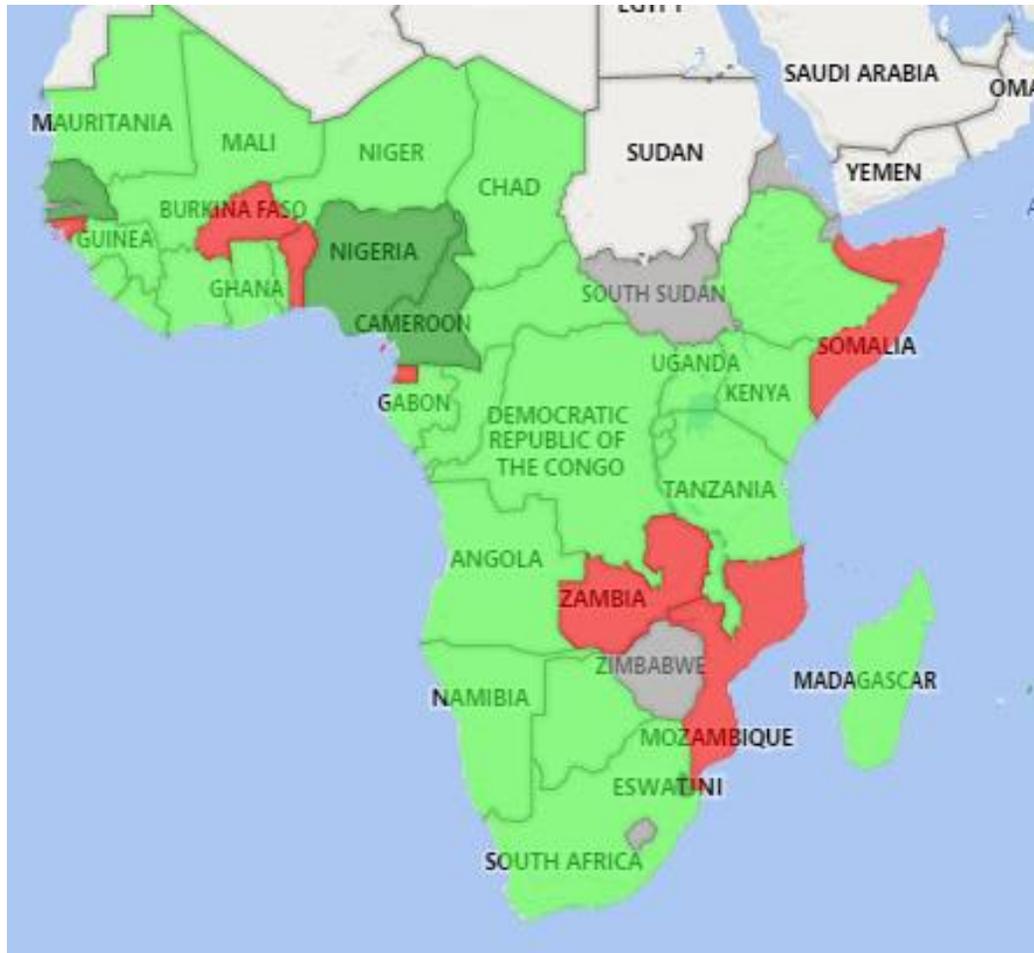
Map 7 - Safety Nets



*The implementation of various methods of Safety nets were considered.*

*Based on the weights on table 1. States in **Dark green** are considered fully ready, **Light green** considered almost ready, **Red** as not ready while **Grey** shows States that had not data (No response to the survey)*

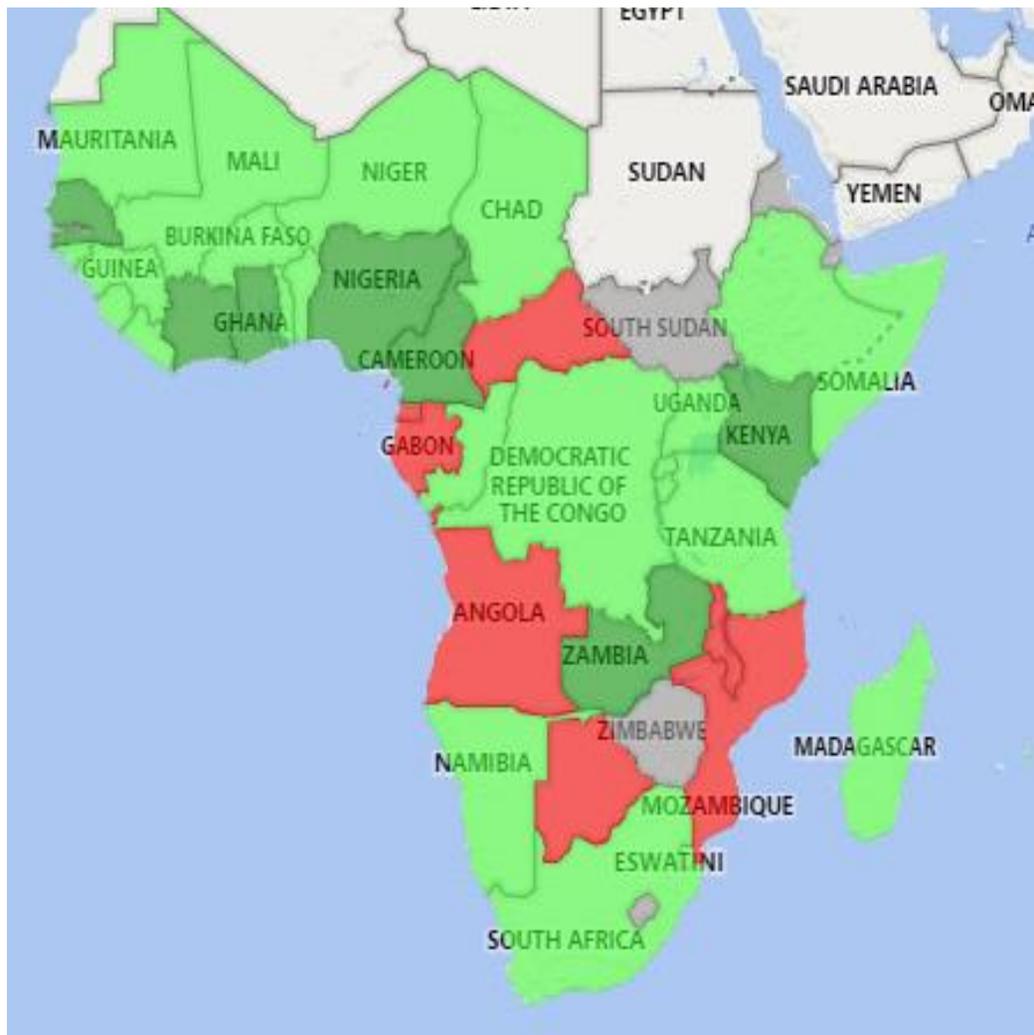
Map 8 - Airspace procedures



*The implementation of various methods of Airspace procedures were considered.*

*Based on the weights on table 1. States in **Dark green** are considered fully ready, **Light green** considered almost ready, **Red** as not ready while **Grey** shows States that had not data (No response to the survey)*

Map 9 - Combined areas depicting AFI readiness



*The evaluation of a combination of all factors considered as a unit Based on the weights on Table 1.*

*States in **Dark green** are considered fully ready, **Light green** considered almost ready, **Red** as not ready while **Grey** shows States that had not data (No response to the survey)*

## ***APPENDIX 5 – AERONAUTICAL METEOROLOGY – REGIONAL IMPLEMENTATION INITIATIVES***

APIRG approved Regional MET projects were established to support States in the implementation of SARPs and regional priorities. The achievements of these projects are summarized as follow:

- a) Achievements by APIRG MET Project 1 for implementation of en-route weather phenomena information (SIGMET), (QMS/MET) service, in the AFI region

Figure 20: *Implementation of SIGMET standards and procedures in the AFI region*

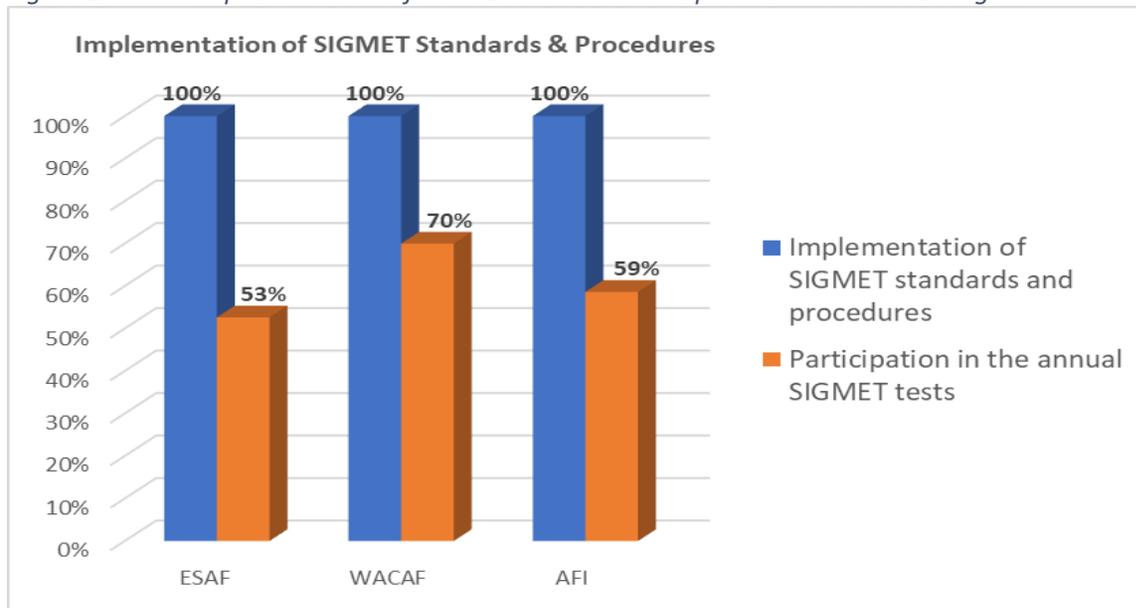
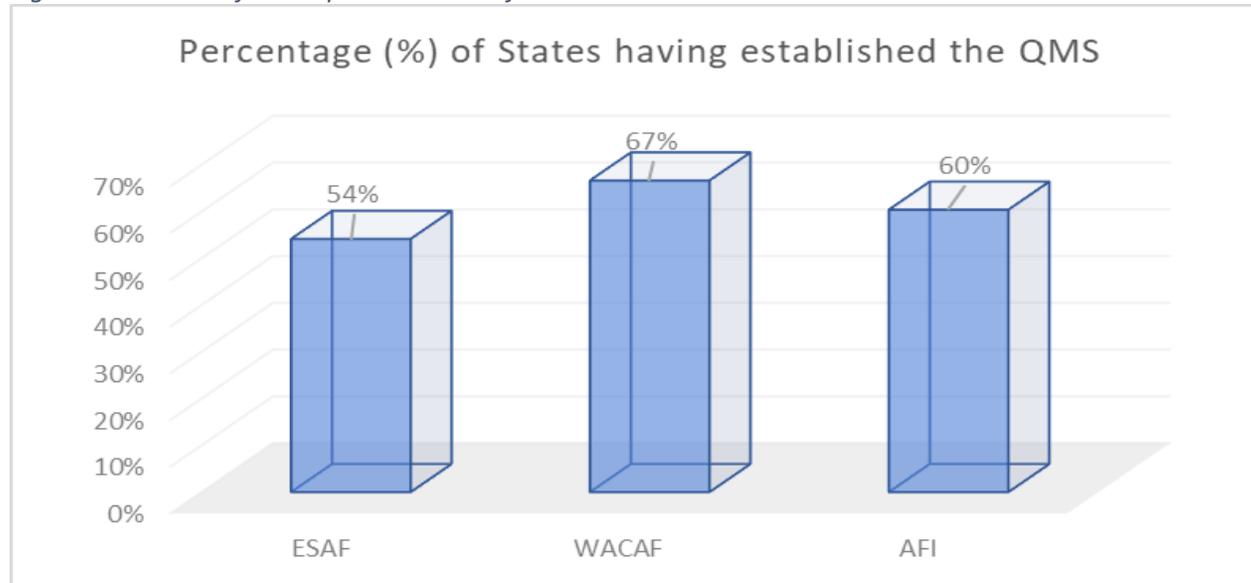
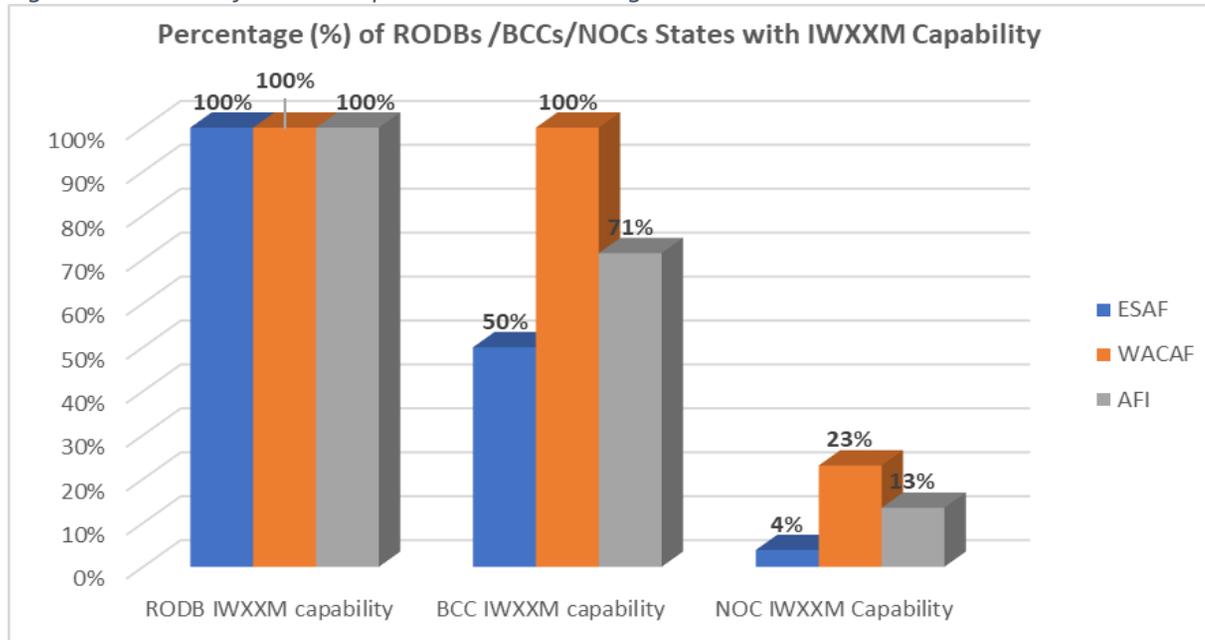


Figure 21: Status of the implementation of QMS in MET



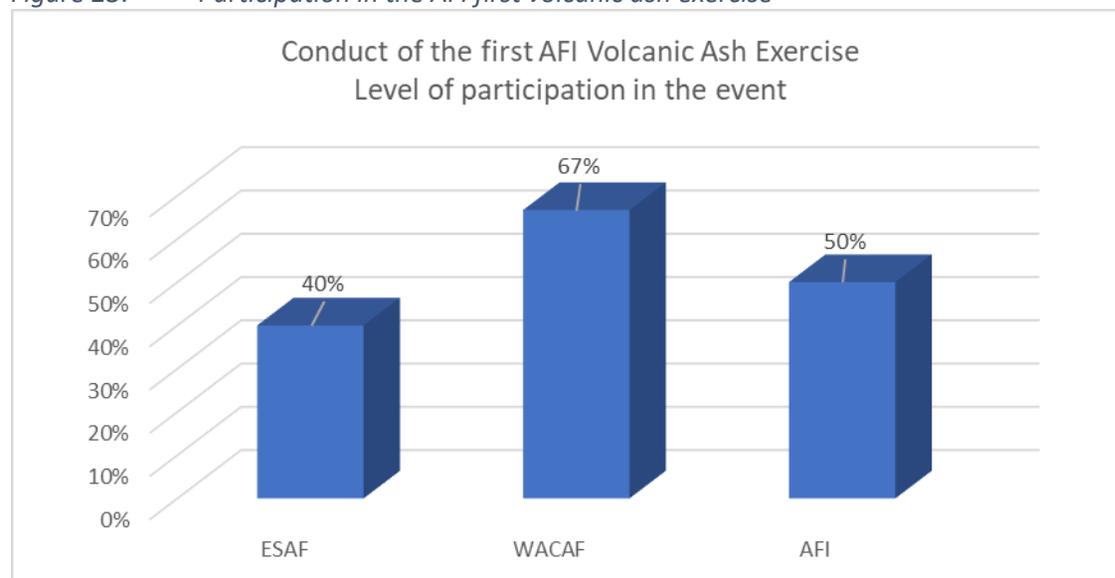
b) Achievements by APIRG MET Project 2 for implementation of Terminal Area Warnings and Forecasts, Provision of WAFS Forecasts and Optimization of

Figure 22: Status of IWXXM capabilities in the AFI region



Establishment of the AFI Volcanic Ash Exercise Steering Group and Conduct of the first volcanic ash exercise with the participation level illustrated hereto.

Figure 23: Participation in the AFI first volcanic ash exercise



- c) MET Project 3 for the implementation of Annex 3 provisions relating to Space Weather requirements within the AFI Region
  - Conduct of Survey on the status of implementation of SWX requirements in the region
  - Introductory awareness workshops conducted
  - Ongoing implementation activities.
  
- d) The APIRG MET projects 1, 2 and 3 have been reviewed and revised to align their references with the groups, Threads and Elements of the GANP 6<sup>th</sup> edition. In addition, two new MET Projects were created to assist States in the implementation of aeronautical meteorological personnel competency standards and removal of deficiencies related to availability of OPMET data in the region.

***Safety Oversight and QMS implementation in MET***

CODEVMET-AFI Project implementation Package developed to assist States in strengthening their Safety oversight system in MET and help State MET Services Providers to Comply with QMS requirements

*ASBU applicable elements in MET*

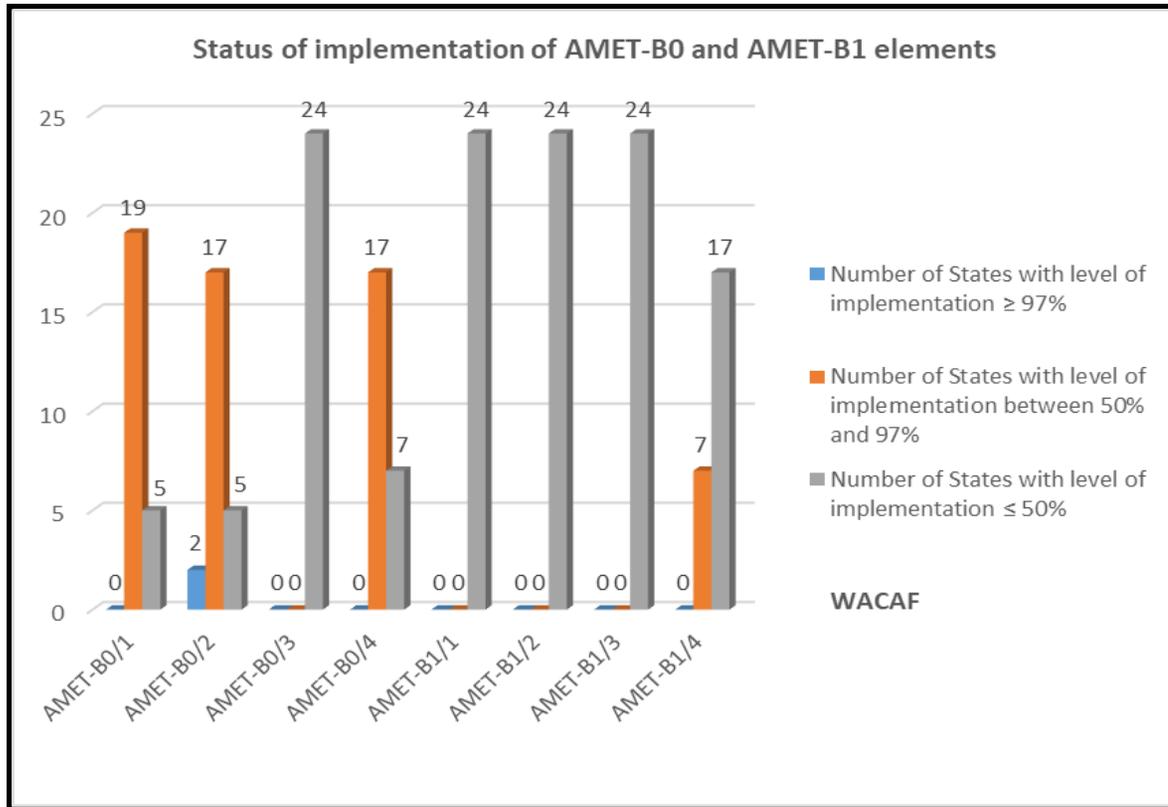
Table 11: *ASBU applicable elements in MET*

<b>AMET-B0</b> : Global, regional and local meteorological information to support flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.	
<b>Element ID</b>	<b>Element Title</b>
AMET-B0/1	Meteorological observations products
AMET-B0/2	Meteorological forecast and warning products
AMET-B0/3	Climatological and historical meteorological products
AMET-B0/4	Dissemination of meteorological products
<b>AMET-B1</b> : Meteorological information supporting automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support	
<b>Element ID</b>	<b>Element Title</b>
AMET-B1/1	Meteorological observations information
AMET-B1/2	Meteorological forecast and warning information
AMET-B1/3	Climatological and historical meteorological information
AMET-B1/4	Dissemination of meteorological information

*Status of implementation of MET ASBU elements*

The status of implementation of elements of AMET-B0 and AMET-B1 is provided in the Figure, showing the number of States with level of implementation  $\geq 97\%$ ; number of States with level of implementation between 50% and 97% and number of States with level of implementation  $\leq 50\%$ .

Figure 24: Status of implementation of AMET-B0 and AMET-B1 elements



## APPENDIX 6 – SEARCH AND RESCUE IMPLEMENTATION - RESULTS OF THE SURVEY

Search and Rescue (SAR) : Status of SAR implementation in the AFI Region

### SUMMARY OF THE STATUS OF AFI STATES IMPLEMENTATION OF SAR

**FI:** Fully Implemented

**PI:** Partially Implemented

**NI:** Not Implemented

**N/A:** Not Applicable

N°	STATES	Regulatory framework	Organisation	Aeronautical / maritime SAR coordination	Publication of SAR information	Funding	SAR Conventions and Agreements	Operational procedures	Equipment / Communications	Personnel, training and exercises	SAR services oversight / Improving services
1	ANGOLA	NI	NI	NI	PI	NI	PI	PI	PI	PI	NI
2	BENIN	FI	FI	PI	PI	PI	PI	PI	PI	PI	PI
3	BOTSWANA	FI	FI	N/A	PI	NI	PI	PI	PI	PI	PI
4	BURKINA FASO	FI	PI	N/A	FI	PI	FI	FI	PI	PI	FI
5	BURUNDI	FI	PI	PI	PI	PI	PI	PI	PI	PI	NI
6	CAMEROON	PI	PI	PI	FI	FI	NI	FI	PI	PI	PI
7	CAPE VERDE	FI	FI	FI	PI	FI	FI	FI	PI	PI	PI

N°	STATES	Regulatory framework	Organisation	Aeronautical / maritime SAR coordination	Publication of SAR information	Funding	SAR Conventions and Agreements	Operational procedures	Equipment / Communications	Personnel, training and exercises	SAR services oversight / Improving services
8	CENTRAL AFRICAN REPUBLIC	PI	PI	N/A	PI	NI	NI	NI	NI	NI	NI
9	DEMOCRATIC REPUBLIC OF CONGO	PI	NI	NI	NI	NI	PI	NI	NI	NI	NI
10	EGYPT	FI	FI	FI	FI	FI	PI	FI	FI	FI	PI
11	ETHIOPIA	FI	FI	FI	PI	PI	FI	FI	PI	PI	PI
12	GABON	NI	PI	PI	PI	NI	NI	NI	NI	NI	NI
13	GAMBIA	PI	PI	PI	FI	PI	NI	FI	NI	NI	NI
14	GHANA	PI	PI	PI	PI	PI	PI	PI	PI	PI	NI
15	IVORY COAST	FI	FI	PI	FI	PI	PI	PI	PI	PI	PI
16	KENYA	FI	FI	FI	PI	PI	PI	PI	PI	PI	PI
17	MALI	FI	FI	N/A	FI	PI	FI	PI	PI	PI	PI
18	MAURITIUS	FI	FI	PI	NI	PI	PI	PI	PI	PI	NI
19	MOROCCO	FI	FI	FI	PI	FI	PI	FI	FI	FI	PI

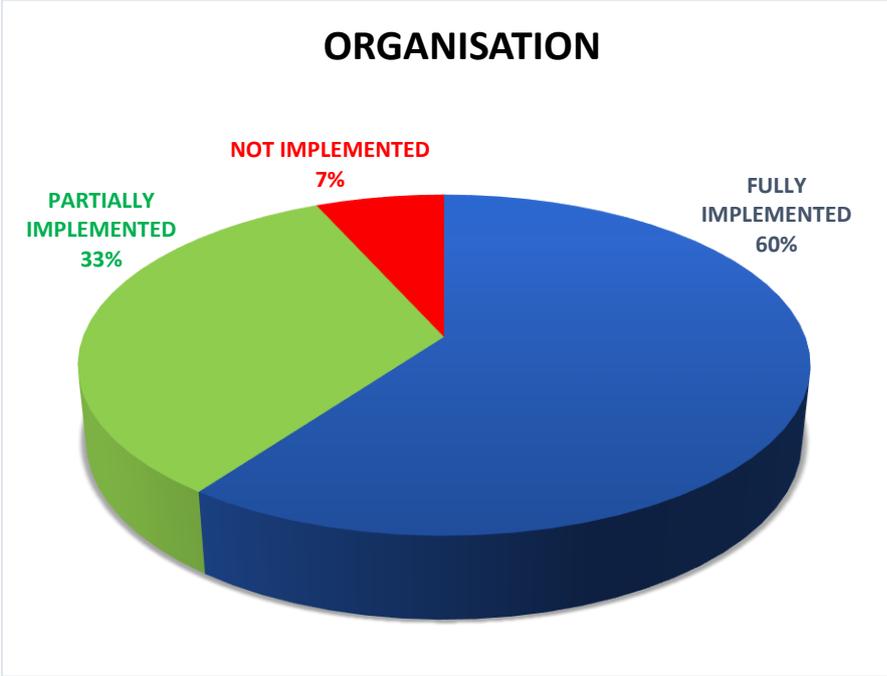
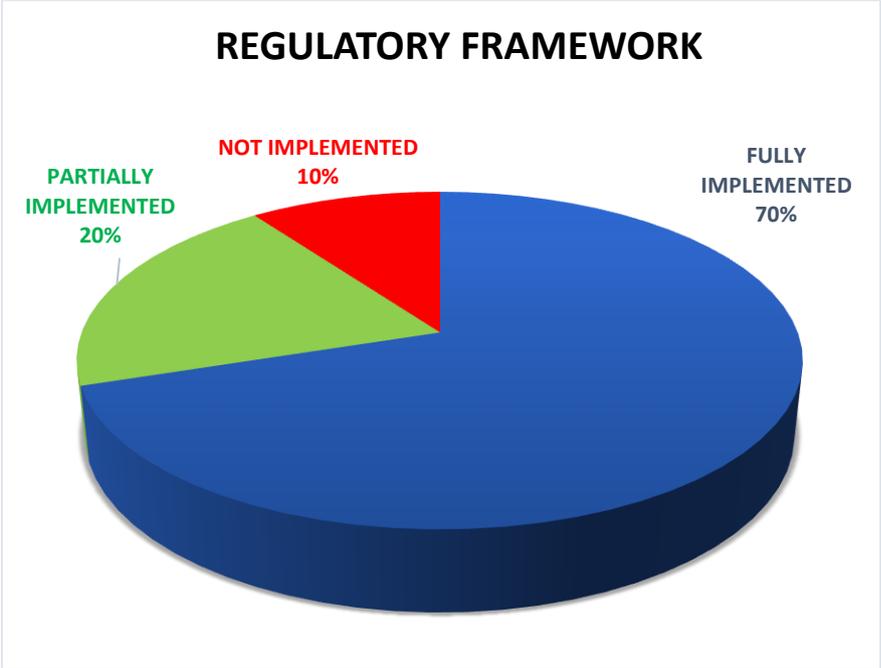
N°	STATES	Regulatory framework	Organisation	Aeronautical / maritime SAR coordination	Publication of SAR information	Funding	SAR Conventions and Agreements	Operational procedures	Equipment / Communications	Personnel, training and exercises	SAR services oversight / Improving services
20	NAMIBIA	FI	FI	PI	PI	NI	FI	PI	PI	PI	PI
21	NIGER	PI	PI	N/A	PI	NI	PI	NI	NI	PI	PI
22	NIGERIA	FI	FI	FI	PI	PI	NI	FI	PI	PI	PI
23	RWANDA	FI	PI	PI	FI	NI	PI	PI	PI	PI	NI
24	SENEGAL	FI	FI	PI	PI	NI	PI	FI	PI	PI	PI
25	SEYCHELLES	NI	PI	FI	PI	NI	PI	NI	PI	PI	PI
26	SOUTH AFRICA	FI	FI	PI	FI	FI	FI	PI	FI	FI	PI
27	SUDAN	FI	FI	FI	PI	FI	PI	PI	PI	PI	NI
28	TANZANIA	FI	FI	PI	PI	PI	FI	NI	PI	PI	PI
29	TOGO	FI	FI	FI	FI	PI	FI	FI	PI	PI	PI
30	UGANDA	FI	FI	FI	PI	FI	PI	FI	PI	PI	NI

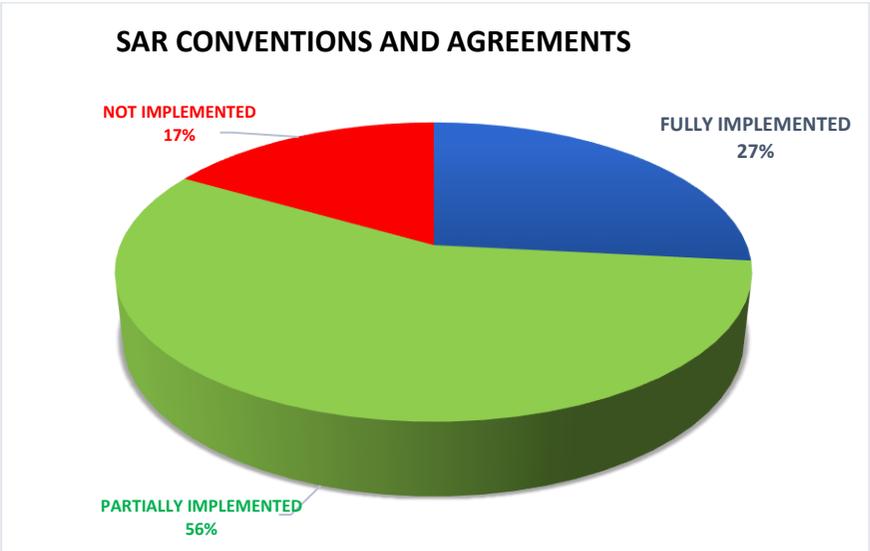
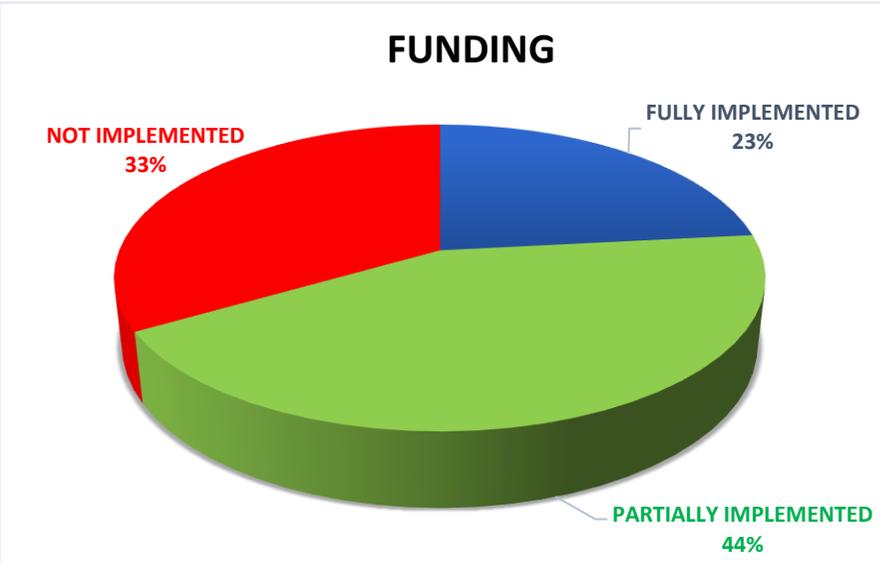
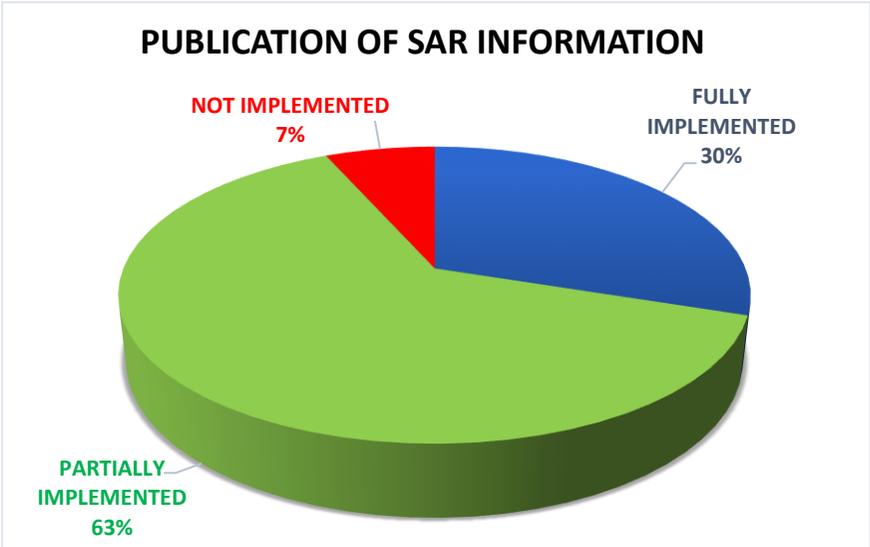
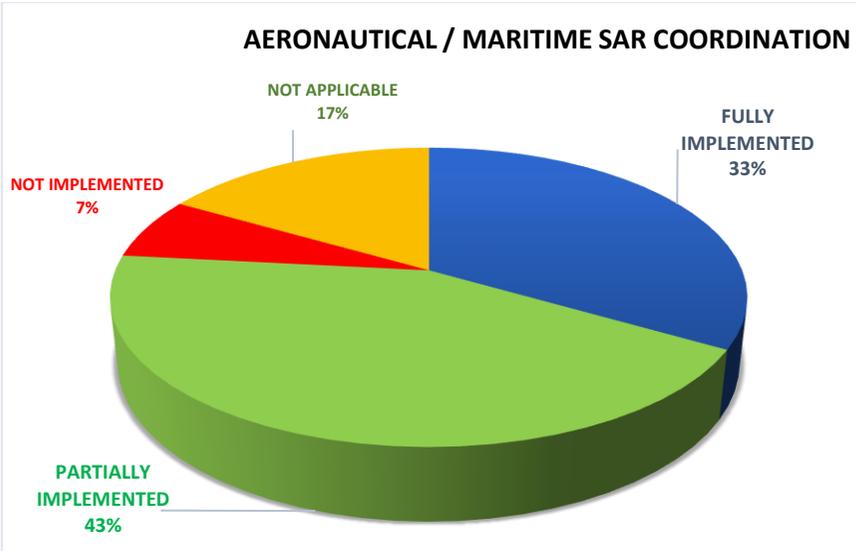
The results are highlighted in percentage of implementation in the following table.

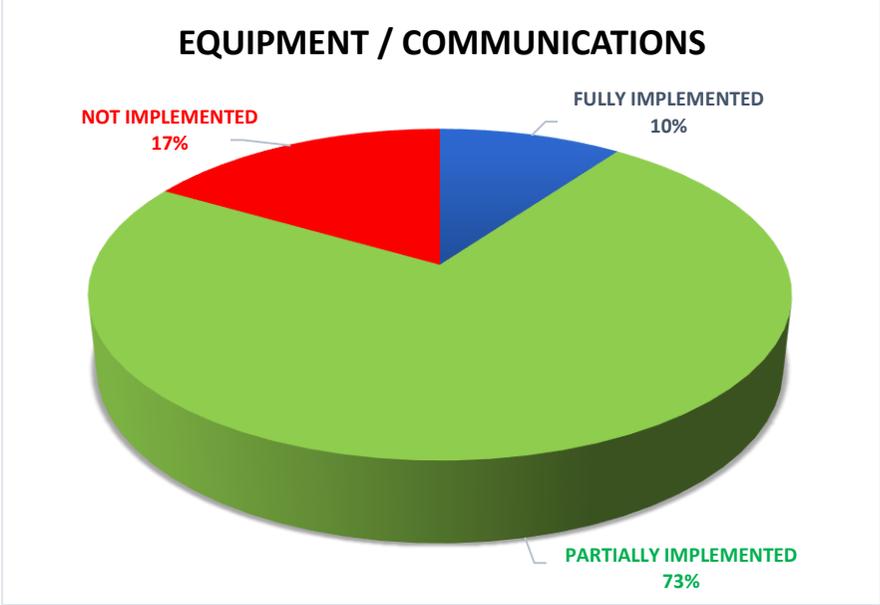
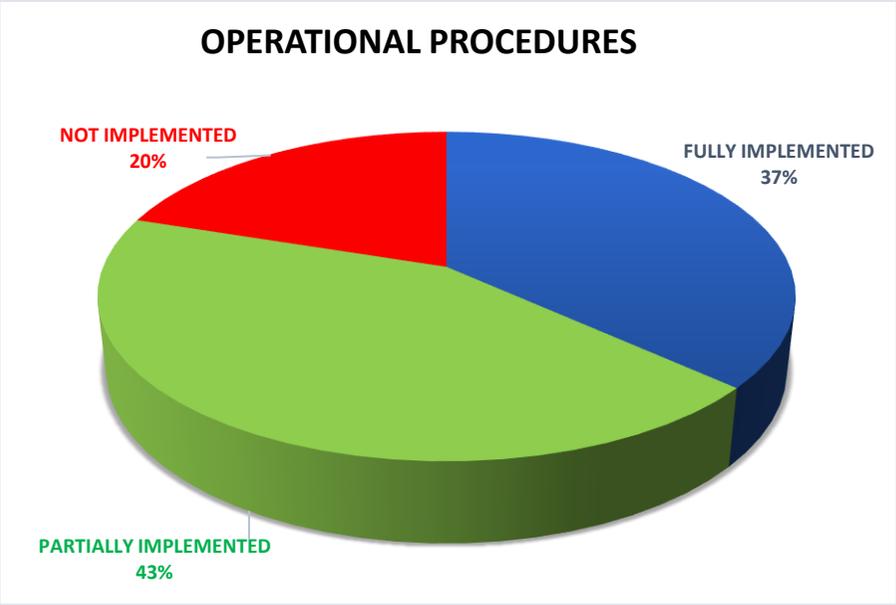
### STATISTICS

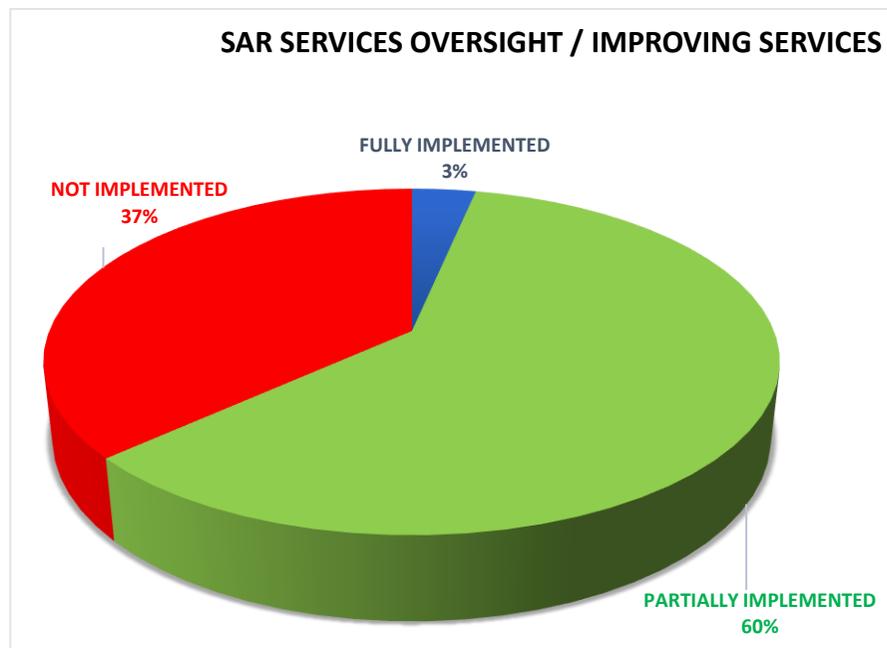
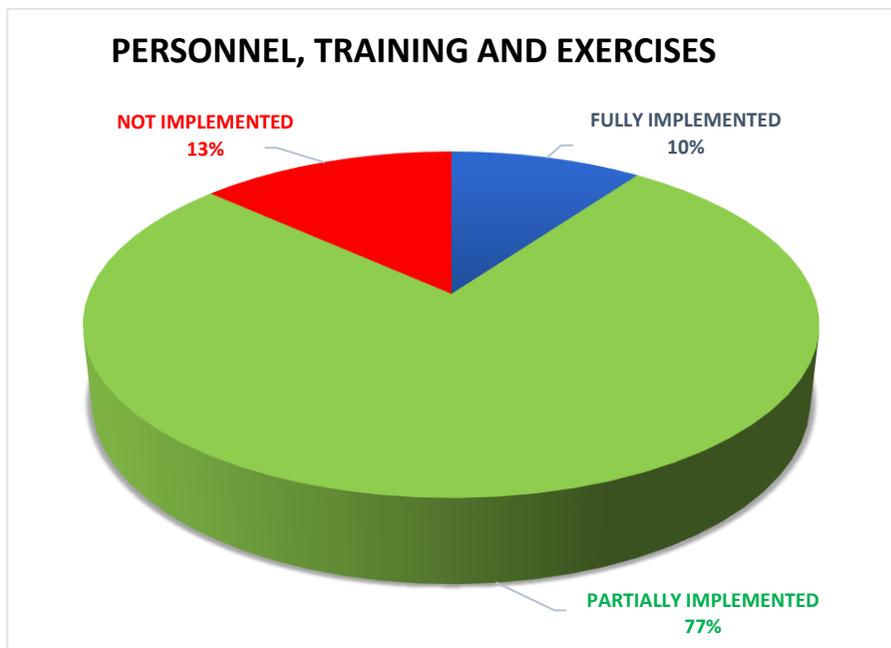
LEVEL OF IMPLEMENTATION	Regulatory framework	Organisation	Aeronautical / maritime SAR coordination	Publication of SAR information	Funding	SAR Conventions and Agreements	Operational procedures	Equipment / Communications	Personnel, training and exercises	SAR services oversight / Improving services
<b>FI</b>	<b>21</b>	<b>18</b>	<b>10</b>	<b>9</b>	<b>7</b>	<b>8</b>	<b>11</b>	<b>3</b>	<b>3</b>	<b>1</b>
	<b>70 %</b>	<b>60 %</b>	<b>33.33 %</b>	<b>30 %</b>	<b>23.33 %</b>	<b>26.67 %</b>	<b>36.67 %</b>	<b>10 %</b>	<b>10 %</b>	<b>3.33 %</b>
<b>PI</b>	<b>6</b>	<b>10</b>	<b>13</b>	<b>19</b>	<b>13</b>	<b>17</b>	<b>13</b>	<b>22</b>	<b>23</b>	<b>18</b>
	<b>20 %</b>	<b>33.33 %</b>	<b>43.33 %</b>	<b>63.33 %</b>	<b>43.33 %</b>	<b>56.67 %</b>	<b>43.33 %</b>	<b>73.33 %</b>	<b>76.67 %</b>	<b>60 %</b>
<b>NI</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>10</b>	<b>5</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>11</b>
	<b>10 %</b>	<b>6.67 %</b>	<b>6.67 %</b>	<b>6.67 %</b>	<b>33.33 %</b>	<b>16.67 %</b>	<b>20 %</b>	<b>16.67 %</b>	<b>13.33 %</b>	<b>36.67 %</b>
<b>N/A</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
			<b>16.67 %</b>							

*Pie-Charts depicting status of SAR implementation in Percentage*









## SAR Interregional Coordination

Table 13 - Interregional (APAC/ESAF/MID and WACAF) SAR implementation Action Plan

No.	Item	Action Required
1.	<b>Nomination of SPOC</b>	States to <b>nominate their Search and Rescue Point of Contact and Alternate, publish</b> their contact details in <b>Aeronautical Information Bulletin</b> and <b>inform the accredited ICAO Regional Offices</b>
2.	<b>National SAR Awareness</b>	States to <b>organize national SAR awareness seminars or workshops to sensitize</b> decision makers and relevant agencies, and <b>seek ICAO Regional Office assistance</b> if and where necessary.
3.	<b>National SAR Committees</b>	States that have not <b>established a National SAR Committee</b> and are unable to do so immediately, should <b>appoint an interim interagency team</b> involving all the relevant organizations to coordinate implementation of SAR improvements in accordance with APIRG conclusions, AFI Air Navigation Performance Targets, and Lomé Declaration and Action Plan.
4.	<b>SAR Gap Analysis</b>	State National SAR committees or where applicable, interim national SAR interagency teams <b>to conduct SAR gap analysis on the status of SAR organisation</b> in their State using the questionnaire attached to the invitation letter as Appendix C, develop or revise action plans and submit them to the ICAO Regional Offices.
5.	<b>National SAR Plans and Operating Procedures (RCCs, RSCs)</b>	State National SAR Committees or where applicable, interim national SAR interagency <b>teams to develop or revise National SAR Plans and Standard Operating Procedures</b> , using the templates in ICAO Doc 9731 IAMSAR Manual (Volumes 1, 2 and 3) and the templates developed by the AFI SAR Technical Experts Team as guidance, and submit them to the ICAO Regional Offices.
6.	<b>SAR Agreements, Multilateral Agreements and Memoranda of Understanding</b>	State National SAR Committees or where applicable, interim national SAR interagency teams <b>to develop or review SAR Agreements, Multilateral Agreements and Memoranda of Understanding</b> for effectiveness, using the templates in ICAO Doc 9731 IAMSAR Manual (Volumes 1, 2 and 3) and the templates developed by the AFI SAR Technical Experts Team as guidance, and submit them to the ICAO Regional Offices.
7.	<b>Support in Signing of SAR Agreements</b>	<b>ICAO, AFCAC, Regional Economic Commissions (RECs) and African Union Commission (AUC)</b> assistance is required to support the signing of SAR Agreements among States; <b>facilitate coordination, harmonization and high-level commitments</b> for the signing of applicable SAR Agreements.
8.	<b>States Specific Assistance</b>	States <b>to identify their specific needs</b> for which external assistance would be required and inform ICAO Regional Offices accordingly.
9.	<b>Development of AFI Regional SAR Plan</b>	An <b>AFI Regional SAR Plan Development Team is established</b> to coordinate the development of an <b>AFI Regional SAR Plan</b> in collaboration with all stakeholders, consider global best practices and the limitations in the AFI Region for submission to APIRG for its review and adoption. Membership.
10.	<b>National and Multi-States SAR Exercises</b>	States are urged to <b>collaborate with other States</b> and other organizations to <b>conduct multi-States SAR Exercises.</b>
11.	<b>GADSS Implementation</b>	States / Air Navigation Services should access the link on the ICAO website in order to <b>provide information on their surveillance systems</b> and indicate whether the update on flight progress is not more than 15 Minutes.

12.	<b>Funding of SAR</b>	States to <b>establish funding schemes</b> to ensure sustainability of SAR equipment and services using the guidance provided in ICAO Manual on air navigation services economics (Doc 9161) and Manual on ICAO’s policies on charges for airports and air navigation services (Doc 9082).
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Table 14 – AFI SAR Survey Questionnaire

	Question/Description	State Response
<b>A. General SAR system concept</b>		
<b>A.1 Regulatory framework</b>		
1.	Has the State enacted legislation that incorporates or is aligned to applicable international Conventions?	
2.	Is the legislation on SAR fully aligned to Article 25 of Chicago Convention?	
3.	Has the State established a single State SAR Plan?	
4.	Does the national SAR plan describe the roles of all government and non-government organizations which have resources that can support SAR?	
<b>A.2 Organisation</b>		
5.	Do the basic elements of SAR services include: a) a legal framework, b) a responsible authority, c) organized available resources, d) communication facilities, and e) a workforce skilled in coordination and operational functions?	
6.	Has the state established a national SAR committee?	
7.	Has the State established a national SAR Executive Committee?	
8.	Has the State established an entity which provides, on a 24-hour basis, SAR services within its territory and the areas where the State has accepted responsibility to provide SAR to ensure that assistance is rendered to persons in distress?	
9.	If the State has not established a SAR entity to provide 24-hour services, has the State arranged with another Contracting State or group of States to provide such SAR services?	
10.	Has the State established a RCC or where applicable RSC in each search and rescue region (SRR)?	
11.	Has the State established additional oceanic SAR capability as far as practicable to ensure a timely and adequate SAR response?	
12.	Has the State established a SAR Manager or an Administrative Single Point of Contact for SAR (ASPOCS) for non-urgent, administrative matters?	
13.	Has the State designated a SAR point of contact for the receipt of COSPAS-SARSAT distress data?	

14.	Has the State designated, as SAR units, elements of public or private services suitably located and equipped for SAR operations?	
<b>A.3 Aeronautical / maritime SAR coordination</b>		
15.	Has the State conducted studies to integrate aviation and maritime SAR, and as far as practicable, civil and military activities?	
16.	Has the State conducted studies to align, as far as practicable, aeronautical and maritime SRRs, and SRRs and FIRs?	
17.	Has the State established a joint rescue coordination centre (RCC) to coordinate aeronautical and maritime SAR operations, or otherwise, when separate aeronautical and maritime RCCs serve the same area, does the State ensure that there is closest practicable coordination between the centres?	
18.	Has the State ensured the closest practicable coordination between the relevant aeronautical and maritime authorities to provide for the most effective and efficient SAR services?	
<b>A.4 Publication of SAR information</b>		
19.	Has the State notified any differences from Annex 12?	
20.	Has the State established a centralised information source publishing all AIP information required on SAR?	
21.	Has the State established an Internet-based SAR information sharing system?	
22.	Has the State established system for the maximum practicable cooperation between State entities for information when required?	
23.	Has the State developed and maintained a current, comprehensive electronic list of State SAR Facilities, SAR Equipment, and SRUs?	
24.	Has the State established an Internet-based SAR Library, or cooperate by contributing to an Internet-based resource?	
25.	Has the State provided each RCC and SAR Authority with ready access to a current copy of SAR reference documents?	
<b>A.5 Funding</b>		
26.	Has the State established a mechanism for financing SAR activities?	
27.	Does this mechanism ensure the financing of SAR services that meet international standards?	
<b>B. SAR Conventions and SAR international Agreements</b>		
28.	Is the Government party to the following Conventions: a) Convention on International Civil Aviation, 1944? b) International Convention on Maritime Search and Rescue, 1979? c) International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended? d) Convention on the High Seas, 1958? e) United Nations Convention on the Law of the Sea (UNCLOS), 1982?	
29.	Does the State coordinate its SAR organization with those of neighbouring States?	
30.	Has the State established SAR agreements with States having adjoining SRRS or FIRs?	
31.	Has the State provided up to date cross-border information on SAR capability to adjoining States?	
32.	Has the State pre-arranged procedures for cross-border SAR responses?	
<b>C. Operational procedures</b>		
33.	Has the State established a functioning RCC or RSC suitably located and appropriately equipped to effectively carry out its SAR functions?	

34.	<p>Does the RCC or RSC equipped with the following facilities:</p> <ul style="list-style-type: none"> <li>a. 24-hour availability</li> <li>b. Trained persons with a working knowledge of the English language</li> <li>c. Charts which apply to the SRR (aeronautical, nautical, topographic and hydrographic)</li> <li>d. Means of plotting</li> <li>e. Ability to receive distress alerts, e.g., from MCCs, CESs, etc.</li> <li>f. Immediate communications with: <ul style="list-style-type: none"> <li>▪ associated ATS units</li> <li>▪ associated RSCs</li> <li>▪ DF and position-fixing stations</li> <li>▪ associated CRSs</li> </ul> </li> <li>g. Rapid and reliable communications with: <ul style="list-style-type: none"> <li>• Parent agencies of SRUs</li> <li>• adjacent RCCs</li> <li>• designated meteorological offices</li> <li>• employed SRUs</li> <li>• alerting posts</li> </ul> </li> <li>h. Plans of operation</li> <li>i. Ability to coordinate provision of medical advice</li> <li>j. Ability to coordinate provision of medical assistance or evacuation</li> </ul>	
35.	Has the State established aerodrome emergency plans that provide for co-operation and co-ordination with RCC/RSCs?	
36.	Has the State established RCC/RSC plans for response to Mass Rescue Operations (MROs) integrated with national disaster plans?	
37.	Has the State established operational plans and procedures for SRUs, provision of support, communication and reporting?	
38.	Has the State established SAR Alerting procedures which are tested, integrated and include civil/military protocols?	
39.	Has the State established contingency facilities, or procedures for the temporary delegation of SAR to another body or State?	
40.	Does the State ensure that each rescue coordination centre (RCC) or RSC has prepared detailed plans of operation for the conduct of SAR operations within its search and rescue region (SRR)?	
41.	Has the State established procedures and necessary infrastructure to coordinate distress beacon alert responses?	
42.	Does each RCC or RSC have an operations manual which provides procedures and guidance material for handling all foreseeable SAR situations?	

43.	Have formal procedures been developed for providing medical assistance and advice and for making medical evacuation decisions?	
44.	Does your State maintain a statistical database on SAR events?	
<b>D. Equipment / communications</b>		
45.	Has the State provided a fully equipped RCC/RSC of sufficient size with adequate provision for operational positions and human factors?	
46.	Has the State established sufficient SRU capabilities (crews, availability, military assets, communications, authority, etc.)?	
47.	Do SAR units in your State have special equipment for medical evacuations?	
48.	Can the RCC(s) or RSC(s) order the deployment of all primary SAR units? If not, does the co-ordination for use of SAR resources take place in a timely manner?	
49.	Do your RCC(s) and RSC(s) use international systems that assist SAR, e.g., AMVER, COSPAS–SARSAT, computer-assisted search planning?	
50.	Has the State established a reliable distress beacon registration system?	
51.	Has the State planned and prepared for the implementation of next generation beacons?	
52.	Has the State established an appropriate nationwide means of disposal for old distress beacons?	
53.	Are 406 MHz beacon registrations maintained in a database?	
54.	Is the database maintained for ELT, EPIRB and PLB 406 MHz distress beacons?	
55.	Is that database available on a 24-hour basis to SAR authorities?	
56.	Do ships and aircraft that are used for SAR have communications and electronic direction-finding capabilities covering all frequencies likely to be used?	
57.	Are there rapid, reliable means for communications between RCCs, and between RCCs and RSCs?	
58.	Do your RCC(s) and RSC(s) have reliable radio communications capabilities covering their entire area(s) of responsibility for working with ships, aircraft and SAR units?	
<b>E. Personnel, training and exercises</b>		
59.	Has the State empowered SAR Mission Coordinators with the authority to adequately carry out their responsibilities?	
60.	Has the established requirement and processes for the designation of a Search and rescue Mission Coordinator (SMC) who will be the official temporarily assigned to coordinate response to an actual or apparent distress situation?	
61.	Has the State provided sufficient RCC/RSC staffing?	
62.	Has the State provided a sufficient number of trained specialist RCC/RCS officers including SMCs and A/SMCs?	
63.	Has the State ensured that each rescue coordination centre (RCC) and rescue sub-centre (RSC) employ sufficient workforce skilled in coordination and operational functions?	
64.	Has the State availability of a pool of RCC/RSC support staff who are familiar with RCC/RSC operations, but not trained as coordinators?	
65.	Has the State developed SAR personnel position descriptions detailing responsibilities and eligibility criteria?	
66.	Does the State ensure that each rescue coordination centre (RCC) and, if appropriate, rescue sub-centre (RSC), develops written job descriptions for each of their technical staff?	

67.	Has the State developed a comprehensive training programme that includes SAR training for SAR Coordinators and SRU staff?	
68.	Does the State develop a periodic training plan detailing and prioritizing the type of SAR training to be provided during a specified period?	
69.	Has the State facilitated RCC staff to be proficient in the English language?	
70.	Does the State ensure that rescue coordination centre (RCC) personnel involved in the conduct of radiotelephony communications are proficient in the use of the English language?	
71.	Does the State ensure that each rescue coordination centre (RCC) and, as appropriate, rescue sub-centre (RSC), is staffed 24 hours a day by trained and qualified personnel proficient in the use of the language used for radiotelephony communications?	
72.	Has the State conducted regular SAREX to test and evaluate coordination procedures, data and information sharing and SAR responses?	
73.	Does the State ensure that SAR personnel are regularly trained and that appropriate SAR exercises are arranged?	
74.	Do crews of primary rescue units participate in regular SAR-related training or exercises?	
<b>G. SAR services oversight / Improving services</b>		
75.	Has the State implemented SAR System Improvement and Assessment measures, including Safety Management and QA systems?	
76.	Has the State conducted an annual or more frequent analysis of their current State SAR system to identify specific gaps in capability?	
77.	Has the State Conducted SAR promotional programmes?	
78.	If the provision of SAR services is under the authority of the air traffic service (ATS) provider, does the State ensure that the scope of the SMS also addresses the provision of these services?	
79.	If the provision of either SAR services is not under the authority of the air traffic service (ATS) provider, does the State ensure that the scope of the SMS includes those aspects of services with direct operational implications?	
80.	Does the State effectively conduct safety oversight over the rescue coordination centre (RCC) and, as appropriate, rescue sub-centre (RSC)?	
81.	Has the State established a mechanism/system with time frame for elimination of deficiencies identified by SAR inspectorate staff?	
82.	Has the State facilitated a programme of regular liaison visits between relevant RCCs, ATC units and airline operating centres?	
83.	Does the State permit, subject to such conditions as may be prescribed by its own authorities, entry into its territory of SAR units of other States for the purpose of searching for the site of aircraft accidents and rescuing survivors of such accidents?	
84.	Does the State authorize its RCCs to provide, when requested, assistance to other rescue coordination centres (RCCs), including assistance in the form of aircraft, vessels, persons or equipment?	
85.	Has the State arranged for all aircraft, vessels and local services and facilities which do not form part of the SAR organization to cooperate fully with the latter in SAR and to extend any possible assistance to the survivors of aircraft accidents?	
86.	Has the State made arrangements for the use of SAR units and other available facilities to assist any aircraft or its occupants who are or appear to be in a state of emergency?	
87.	Does your State send delegates to participate directly in meetings of ICAO and IMO that deal with SAR issues?	
88.	Do your SAR managers stay informed on decisions, and outcomes of meetings conducted by ICAO and IMO?	

<b>H. Implementation of the Global Aeronautical Distress and Safety System (GADSS)</b>	
89.	<b><i>Underwater Locating Devices:</i></b> Does the State ensure applicability of ICAO Annex 6, Part 1, provision 6.5.3.1c which required by 1 January 2018, for all aeroplanes of a maximum certificated takeoff mass of over 27 000 kg, a securely attached underwater locating device operating at a frequency of 8.8 kHz?
90.	<b><i>Aircraft Tracking Function:</i></b> Does State ensure that ICAO Annex 6 Part 1, section 3.5 applicable on the 08 Nov 2018, which requires the operator to establish an aircraft tracking capability to track aeroplanes throughout its area of Operations?
91.	<b><i>Aircraft Tracking Function:</i></b> Does the State ensure that the operator track the position of an aeroplane, with a maximum certificated take-off mass of over 45 500 kg and a seating capacity greater than 19, through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) that is planned in an oceanic area(s) where an ATS unit obtains aeroplane position information at greater than 15 minute intervals?
92.	<b><i>Autonomous Distress Tracking Function:</i></b> Does the State has a plan to ensure the applicability of ICAO Annex 6 Part 1, section 6.18 which requires that all aeroplanes, of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2021, shall autonomously transmit information from which a position can be determined by the operator at least once every minute, when in distress?
93.	<b><i>Flight Recorder Data Recovery:</i></b> Does the State has a plan to ensure that ICAO Annex 6 Part 1, section 6.3.5 which requires that all aeroplanes of a maximum certificated take-off mass of over 27 000 kg and authorized to carry more than nineteen passengers for which the application for type certification is submitted to a Contracting State on or after 1 January 2021, shall be equipped with a means approved by the State of the Operator, to recover flight recorder data and make it available in a timely manner?

## APPENDIX 7 – STATUS OF IMPLEMENTATION OF ATM RELATED ASBU ELEMENTS

Table 12 – Status of Implementation of ATM related ASBU Elements

2	I = Implemented	NI = Not implemented	IP = In progress	N/A = Not applicable																					
Essentials services (BBBs) to be implemented <i>(List the required essential services)</i>	RANP requirements (eANP Vol I & Vol II refer) <i>(Provide the corresponding regional requirements)</i>	Angola	Botswana	Burundi	Comoros	Djibouti	Eritrea	Eswatini	Ethiopia	Kenya	Lesotho	Madagascar	Malawi	Mauritius	Mozambique	Namibia	Rwanda	Seychelles	Somalia	South Africa	South Sudan	Uganda	United Rep. of Tanzania	Zambia	Zimbabwe
ACAS	B0-ACAS Improvement (ACAS II -TCAS version 7.1)	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
FRTO	B0/1 Direct Routing (DCT)	I	I	NI	NI	NI	I	I	I	I	NI	I	I	I	I	I	I	I	NI	I	NI	I	I	I	I
	B0/2 Airspace planning and Flexible Use of Airspace (FUA)	NI	NI	NI	NI	NI	NI	NI	I	I	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	B0/3 Pre-validated and coordinated ATS routes to support flight and flow	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	B0/4 Basic conflict detection and conformance monitoring.	NI	NI	NI					I	I		I	NI	I	NI	NI	NI	NI	NI	NI	NI	I	NI		NI
	B1/1 Free Route Airspace (FRA)	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	I	NI	NI	NI	NI	NI	NI	NI	NI	NI		NI
	B1/2 Required Navigation Performance (RNP) routes	NI	NI	NI	NI	NI	NI	NI	I	I	NI	NI	NI	I	I	NI	NI	I	NI	I	NI	I	I		NI

APTA	B0/1 PBN Approaches (Basic)	I	I	I	I	I	I	NI	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	B0/2 PBN SIDS and STAR procedures (Basic)	I	I		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	B0/3 SBAS/GBAS CAT I precision approach procedures	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
	B0/4 CDO (Basic)	NI	NI	NI				NI	I	I	NI	NI	NI	I	NI	NI	NI	NI	NI	I	NI	I	NI		NI
	B0/5 CCO (Basic)	NI	NI	NI				NI	I	I	NI	NI	NI	I	NI	NI	NI	NI	NI	I	NI	I	NI		NI
	B0 - TBO (Datalink - CPDLC/ADS-C)	I	NI	N/A	N/A	N/A	NI	N/A	NI	I	N/A	I	N/A	I	NI	N/A	N/A	I	I	I	NI	N/A	NI		N/A
SNET	B0/1 STCA	NI	I	NI				NI	I	I		I	I	I	I	I	I		I	I	NI	I	I		I
	B0/2 MSAW	NI	I	NI				NI	I	I		I	I	I	I	I	I		I	I	NI	I	I		I
	B0/3 APW	NI	I	NI				NI	I	I		I	NI	I	I	NI	NI		I	I	NI	I	I		I
	B0/4 APM	NI	I	NI				NI	I	I		I	NI	I	I	NI	NI		I	I	NI	I	I		I

**APPENDIX 8 - INDUSTRY INITIATIVES – ATNS ASBU IMPLEMENTATION PLAN**

The ATNS ASBU implementation Plan

**ASBU Block 0 Elements**

Block 0 Modules	Module Title	Purpose	Need Analysis of				Implementation Status						
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented			
<b>THREAD 1: OPERATIONAL</b>													
ACDM-B0/1	Airport CDM Information Sharing (ACIS)	To generate common situational awareness, which will foster improved decision making within aerodromes, by sharing relevant surface operations data among the local		X						X		ASMGCS implemented at FACT and FAOR. AMC implemented at FAOR, FACT and FALE. CDM Data shared on daily basis between stakeholders, however,	75%

ACDM-B0/2	Integration with ATM Network function	Airport CDM operations will be enriched by enhanced arrival information from the ATM network and, at the same time, network operations will benefit from more accurate		X					X		AMAN implemented for FACT & FAOR. DMAN still to be implemented and AMAN/DMAN to be connected to Airport	75%
APTA-B0/1	PBN Approaches (with basic capabilities)	This element represents the use of PBN in design of approach procedures to provide more flexibility to airspace planners to manage the use of airspace, and to facilitate access to airports. It includes the provision of instrument approach procedures with vertical guidance in support of			X					X	Implemented. Refer to South African PBN implementation plan	100%
APTA-B0/2	PBN SID and STAR procedures (with basic capabilities)	Use of PBN capabilities allows more flexible placement of arrival and departure routing without the need for ground based infrastructure to support these routes.			X					X	Implemented. Refer to South African PBN implementation plan.	100%

APTA-B0/3	SBAS/GBAS CAT I precision approach procedures	Introduction of SBAS and GBAS CAT I procedures allow for reduced minima at aerodromes situated in areas of significant terrain, where ILS is not possible.		X	X		X				in progress, feasibility and CBA studies underway.	0%
Block 0 Modules	Module Title	Purpose	Need Analysis of				Implementation Status				Remarks	Implemented
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented		
APTA-B0/4	CDO (Basic)	Reduce fuel burn by not requiring application or power during descent.		X	X			X			In the process of being implemented	50%

<p>APTA-B0/5</p>	<p>CCO (Basic)</p>	<p>Reduce fuel burn by not requiring level-offs during climb.</p>		<p>X</p>	<p>X</p>			<p>X</p>			<p>In the process of being implemented</p>	<p>50%</p>
<p>APTA-B0/6</p>	<p>PBN Helicopter Point in Space (PinS) Operations</p>	<p>Helicopter unique capabilities allow IFR operations that start or terminate from any suitable point in space (PinS), as long as visual conditions support take-off/landing capability from that point.</p>	<p>X</p>								<p>Not implemented</p>	<p>0%</p>
<p>APTA-B0/7</p>	<p>Performance based aerodrome operating minima – Advanced aircraft</p>	<p>Standard Aerodrome operating minima are predicated upon aircraft equipped with the minimum required equipment (the basic aircraft) for that approach. These aerodrome operating minima relate directly to the established types and categories of operations and the associated infrastructure requirements (e.g. runway</p>	<p>X</p>								<p>Not implemented</p>	<p>0%</p>
			<p>Need Analysis of</p>				<p>Implementation Status</p>					

Block 0 Modules	Module Title	Purpose											
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented			Implemented	
APTA-B0/8	Performance based aerodrome operating minima – Basic aircraft	For Basic aircraft, improvements include: Instrument approaches to non-instrument runways, improving airport access Flexibility to gradually improve the ground infrastructure with consequent improvements in operating minima			X					X		Not implemented	0%
FRTO-B0/1	Direct routing (DCT)	Direct routings are established with the aim of providing airspace users with additional flight planning route options on a larger scale across FIRs such that overall planned leg distances are reduced in comparison with the fixed route network.		X	X					X		DCT routing only applied on a tactical basis within continental airspace. Random routing, UPR implemented in Oceanic Airspace.	75%

FRTO-B0/2	<b>Airspace planning and Flexible Use of Airspace (FUA)</b>	Establish the Flexible Use of Airspace (FUA) process and improve data exchange between civil and military stakeholders by automation to enable a more efficient use of airspace based on transparency and due regard to national security needs.			X					X	FUA Implemented within the South African FDRG (FAJA/CA/JO). Free routing implemented in FAJO. Airspace planning routed through CAMU.	100%
FRTO-B0/3	<b>Pre-validated and coordinated ATS routes to support flight and flow</b>	A collection of routes that have been pre-validated and coordinated with impacted air route traffic control centers and airspace users.		X	X				X		pre-validated routes implemented and supported by means of ATS Route Matrix.	75%
FRTO-B0/4	<b>Basic conflict detection and conformance monitoring</b>	Reduction of ATCO's workload via early and systematic conflict detection and conformance monitoring.			X					X	Implemented within the Topsky ATC.	100%

<p><b>FRTO-B0/5</b></p>	<p><b>Enhanced Conflict Detection Tools and Conformance Monitoring</b></p>	<p>Enhancements of basic mid-term conflict detection (MTCD)/ monitoring alert (MONA) functions and thus further improving the ATCO productivity and reducing the workload.</p>		<p>X</p>	<p>X</p>			<p>X</p>			<p>MTCD TOPSKY ATC TCT implementation planned for Q1 2023.</p>	<p>50%</p>	
<p><b>Block 0 Modules</b></p>	<p><b>Module Title</b></p>	<p><b>Purpose</b></p>	<p><b>Need Analysis of Modules</b></p>				<p><b>Implementation Status</b></p>						
			<p>Not Started</p>	<p>In Progress</p>	<p>Need</p>	<p>N/A</p>	<p>Planning</p>	<p>Developing</p>	<p>Partially Implemented</p>	<p>Implemented</p>			

<p><b>FRTO-B0/6</b></p>	<p><b>Multi-Sector Planning</b></p>	<p>This element is applicable only to en-route sectors that are currently staffed by two ATCOs (planning and tactical). The multi-sector planning (MSP) function defines a new organization of controller team(s) and new operating procedures to enable the planning controller to provide support to several tactical controllers operating in different adjacent sectors. This function might reduce the ATCO workload related to intra/inter centre coordination. The workload conversion to potential capacity gains might vary considerably depending on the sector configurations.</p>			X						X	<p>Implemented within the Topsy ATC.</p>	<p>100%</p>
<p><b>FRTO-B0/7</b></p>	<p><b>Trajectory Options Set (TOS)</b></p>	<p>To give airspace users greater flexibility and control over their trajectory with respect to airspace constraints</p>		X				X				<p>Consideration for implementation under FRA Project</p>	<p>50%</p>

<p><b>NOPS-B0/1</b></p>	<p><b>Initial integration of collaborative airspace management with air traffic flow management</b></p>	<p>Introduce ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace management and air traffic flow and capacity management process applicable to the strategic through to the tactical phases of operations.</p>			<p>X</p>						<p>X</p>	<p>ATFM and FUA in support of ASM fully implemented within CAMU.</p>	<p>100%</p>
<p><b>NOPS-B0/2</b></p>	<p><b>Collaborative Network Flight Updates</b></p>	<p>Improve ATFM situation awareness in order to facilitate re-routings and coordinated application of ATFM measures.</p>		<p>X</p>				<p>X</p>				<p>ATM system integration and activation of What if</p>	<p>50%</p>

<p><b>NOPS-B0/3</b></p>	<p><b>Network Operation Planning basic features</b></p>	<p>The Network Operation Planning provides an overview of the situation from strategic planning through real time operations with ever increasing accuracy up to and including the day of operations by a common situational awareness for all ATFM actors within and adjacent to the ATFM area and allowing network wide demand</p>			<p>X</p>					<p>X</p>	<p>partially implemented and data exchange and integration will be further enable by CAMU</p>	<p>75%</p>
<p><b>Block 0 Modules</b></p>	<p><b>Module Title</b></p>	<p><b>Purpose</b></p>	<p><b>Implementation Status</b></p>									
<p><b>NOPS-B0/4</b></p>	<p><b>Initial Airport/ATFM Slots and A-CDM Network Interface</b></p>	<p>Initial integration of airports into the ATM network function.</p>	<p>Not Started</p>	<p>In Progress</p>	<p>Need</p>	<p>N/A</p>	<p>Planning</p>	<p>Developing</p>	<p>Partially Implemented</p>	<p>Implemented</p>	<p>City Pair coordinated airports of the golden</p>	<p>75%</p>
<p><b>NOPS-B0/5</b></p>	<p><b>Dynamic ATFM slot allocation</b></p>	<p>Provision of dynamic departure ATFM slot allocation including Calculated Take-off Time (CTOT) for regulated flights to avoid ATFM congestions.</p>			<p>X</p>					<p>X</p>	<p>CTOT implemented with CAMU system</p>	<p>100%</p>

OFPL-B0/1	<b>In Trail Procedure (ITP)</b>	To enable aircraft to reach a more satisfactory flight level for flight efficiency or to avoid turbulence for safety.	X			X					nil requirement identified	0%	
RSEQ-B0/1	<b>Arrival Management</b>	To optimize sequencing for arrivals.			X						X	Implemented in FAOR and FACT.	100%
RSEQ-B0/2	<b>Departure Management</b>	To optimize departure operations.	X		X							Planned for FACT and FAOR 2022-2027 permission.	0%
RSEQ-B0/3	<b>Point merge</b>	To allow merging of arrival flows.	X		X							Feasibility study to be initiated	0%
SNET-B0/1	<b>Short Term Conflict Alert (STCA)</b>	To assist the air traffic controller in preventing collision between aircraft, using position data from ground surveillance.			X						X	Integrated within TopSky-ATC	100%

SNET-B0/2	<b>Minimum Safe Altitude Warning (MSAW)</b>	To assist the air traffic controller in preventing controlled flight into terrain accidents by generating, in a timely manner, an alert of aircraft proximity to terrain or obstacles.			X						X	Integrated within TopSky-ATC	100%
SNET-B0/3	<b>Area Proximity Warning (APW)</b>	APW is designed, configured and used to make a significant positive contribution to the prevention of accidents arising from unauthorized penetration of an			X						X	Integrated within TopSky-ATC	100%
Block 0 Modules	Module Title	Purpose	Need Analysis of Modules				Implementation Status					Implemented	
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially	Implemented			

SNET-B0/4	<b>Approach Path Monitoring (APM)</b>	APM is a ground-based safety net intended to warn the controller about increased risk of controlled flight into terrain accidents by generating, in a timely manner, an alert of aircraft proximity to terrain or obstacles during final approach.			X					X	Integrated within TopSky-ATC	100%
SURF-B0/1	<b>Basic ATCO tools to manage traffic during ground operations</b>	To improve safety and efficiency during ground operations by providing proper indications to pilots and vehicle drivers.			X					X	A-SMGCS level 1 AND 2 at FAOR and FACT	100%
SURF-B0/2	<b>Comprehensive situational awareness of surface operations</b>	To better maintain ATCO awareness of ground operations.			X					X	A-SMGCS level 1 AND 2 at FAOR and FACT	100%
SURF-B0/3	<b>Initial ATCO alerting service for surface operations</b>	Detection by the ATCO of potentially unsafe situations with regard to runway operations.			X					X	A-SMGCS level 1 AND 2 at FAOR and FACT	100%

TBO-B0/1	Introduction of time- based management within a flow centric	Provides for more efficient flight operation by using time-based scheduling versus more tactical measures such as holding			X					X	Integrated into TOPSKY ATC and AMAN	100%
THREAD 2: INFORMATION												
AMET-B0/1	Meteorological observations products	Meteorological observations in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.			X					X	SAWS to provide inputs	100%
AMET-B0/2	Meteorological forecast and warning products	Meteorological forecasts, advisories and warnings in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.			X					X	SAWS to provide inputs	100%
			Need Analysis of Modules				Implementation Status					

Block 0 Modules	Module Title	Purpose	Not Started	In Progress	Need	N/A	Planning	Developing	Partially	Implemented		Implemented
AMET-B0/3	<b>Climatological and historical meteorological products</b>	Climatological products in support of the design and planning of infrastructure, flight routes and airspace management. Historical meteorological observations, forecasts, advisories and warnings in support of incident and accident investigations			X					X	SAWS to provide inputs	100%
AMET-B0/4	<b>Dissemination of meteorological products</b>	Dissemination of meteorological products in support of flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning			X					X	SAWS to provide inputs	100%
FICE-B0/1	<b>Automated basic inter facility data exchange (AIDC)</b>	To improve the efficiency of coordination and transfer of control between ATS units.		X					X		AIDC implemented within FACA/FAJA	75%

**THREAD 3: TECHNOLOGY**

ASUR-B0/1	<b>Automatic Dependent Surveillance – Broadcast (ADS-B)</b>	To support the provision of Air Traffic Services and operational applications at reduced cost and increased surveillance coverage.		X						X	Space Based ADS-B (SBA) operational trials underway,	75%
ASUR-B0/2	<b>Multilateration cooperative surveillance systems (MLAT)</b>	To provide an alternative to radar surveillance by using available aircraft transponders.		X					X		WAM project Phase 1 commissioning planned for Dec	50%
ASUR-B0/3	<b>Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)</b>	To obtain additional information from an aircraft transponder in support of the provision of Air Traffic Services.		X					X		Part of the Space Based ADS-B (SBA) Operational trials, SSR Mode S	50%
Block 0 Modules	Module Title	Purpose	Need Analysis of Modules				Implementation Status					Implemented
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially	Implemented		

<p>COMI-B0/1</p>	<p><b>Aircraft Communication Addressing and Reporting System (ACARS)</b></p>	<p>ACARS provides the network for the controller and pilot with the ability to exchange datalink messages and thus provides a backup to voice communications. It also provides for airline operational control messages.</p>		<p>X</p>					<p>X</p>	<p>Partially implemented South African domestic operators</p>	<p>75%</p>
<p>COMI-B0/2</p>	<p><b>Aeronautical Telecommunication Network/Open System Interconnection (ATN/OSI)</b></p>	<p>ATN/OSI provides a bit-oriented multi-layer protocol for exchanging ATS messages between the aircraft and ground system.</p>			<p>X</p>				<p>X</p>	<p>CPDLC and ADS-C implemented</p>	<p>100%</p>

COMI-B0/3	VHF Data Link (VDL) Mode 0/A	VDL Mode 0/A is a data communications subnetwork that supports transmission of data link messages.				X					VDL Mode 2 preferred in line with the NAMP and national communication strategy.	0%
COMI-B0/4	VHF Data Link (VDL) Mode 2 Basic	VDL Mode 2 Basic is a data communications subnetwork that supports transmission of data link messages. It provides higher performance than VDLMO/A.		X			X				Planning considerations include CPDLC and DCL	25%
COMI-B0/5	Satellite communications (SATCOM) Class C Data	To provide surveillance and communications where VHF usage is not possible or practical.			X					X	Partially implemented	75%

Block 0 Modules	Module Title	Purpose	Need Analysis of Modules				Implementation Status				Implemented	
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially	Implemented		
COMI-B0/6	High Frequency Data Link (HFDL)	To communicate in areas where SATCOM and VHF are not available.			X					X	Implemented within FAJO	100%
COMI-B0/7	ATS Message Handling System (AMHS)	Supports improved communication over AFTN Provide flight information coordination between ANSPs at adjacent FIRs, and with relevant military units, support separation assurance, potentially providing, when used in conjunction with other enablers (e.g. navigation capabilities), reduced separation			X					X	Implemented - Refer AIP GEN 3.4	100%

COMS-B0/1	CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace	Supports : reduction of voice channel congestion and increase of capacity in domestic airspace, improvement of communication and surveillance in airspace where procedural separation is			X					X	Implemented - Refer AIP GEN 3.3	100%
COMS-B0/2	ADS-C (FANS 1/A) for procedural airspace	Supports improvement of surveillance in airspace where procedural separation is being applied.			X					X	Implemented - Refer AIP GEN 3.3	100%
Block 0 Modules	Module Title	Purpose	Need Analysis of Modules				Implementation Status					Implemented
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially	Implemented		

<p><b>NAVS-B0/1</b></p>	<p><b>Ground Based Augmentation Systems (GBAS)</b></p>	<p>Support Precision Approach and landing operations at a specific airport (one system may support all runway ends). As an option, may support arrival and departure phases of flight</p>		<p>X</p>			<p>X</p>				<p>Feasibility and CBA studies underway in line with the</p>	<p>25%</p>
<p><b>NAVS-B0/2</b></p>	<p><b>Satellite Based Augmentation Systems (SBAS)</b></p>	<p>Support PBN in all phases of flight with an increased accuracy, integrity and availability compared to ABAS. Increases accuracy and integrity for the vertical guidance.</p>		<p>X</p>			<p>X</p>				<p>Feasibility and CBA studies underway in line with the national</p>	<p>25%</p>
<p><b>NAVS-B0/3</b></p>	<p><b>Aircraft Based Augmentation Systems (ABAS)</b></p>	<p>Support non-precision (LNAV) and vertically guided (LNAV/VNAV) approaches with BaroVNAV and other terminal and enroute navigations.</p>		<p>X</p>			<p>X</p>				<p>Under consideration, suiteability to be determined. Refer to</p>	<p>25%</p>

<p>NAVS-B0/4</p>	<p><b>Navigation Minimal Operating Networks (Nav. MON)</b></p>	<p>To adjust conventional navaids networks through the increased deployment of satellite based navigation systems and procedures to ensure the necessary levels of resilience for navigation. To provide a minimum level of capabilities to accommodate State aircraft operations where there is a mismatch in terms of aircraft equipage. To make a more efficient use of the frequency spectrum</p>			<p>X</p>					<p>X</p>	<p>PBN Roadmap and Contingency planning in line with the NAMP.</p>	<p>100%</p>
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### ASBU Block 1 Elements

Block 1 Modules	Module Title	Purpose	Need Analysis of				Implementation				Remarks	
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented		
T												

<p><b>ACAS-B1/1</b></p>	<p><b>ACAS Improvements</b></p>	<p>To provide airborne collision avoidance as a last resort safety net for pilots.</p>			<p>X</p>					<p>X</p>	<p>SACAR 135.05.8 Says all aeroplanes above 5 700 kg regardless of passenger seats shall have ACAS II. Refer AIP GEN</p>	<p>100%</p>
<p><b>ACDM-B1/1</b></p>	<p><b>Airport Operations Plan (AOP)</b></p>	<p>To enhance the planning and management of airport operations and allow their fully integration in the ATM network and enhance collaboration between airport stakeholders.</p>			<p>X</p>					<p>X</p>	<p>AMC implemented at FACT, FALE and FAOR</p>	<p>100%</p>
<p><b>ACDM-B1/2</b></p>	<p><b>Airport Operations Centre (APOC)</b></p>	<p>The integration of all stakeholders, both landside and airside, into a coherent decision making entity/process (and team), using the shared information and capabilities provided through the AOP</p>			<p>X</p>					<p>X</p>	<p>AMC implemented at FACT, FALE and FAOR</p>	<p>100%</p>

APTA-B1/1	PBN Approaches (with advanced capabilities)	PBN approaches with advanced functionality allow for the introduction of more flexible approaches including the use of RF legs within the Final Approach Segment (FAS) and RNP.			X						Implemented as per National PBN plan at all International aerodromes and selected domestic aerodromes	100%
APTA-B1/2	PBN SID and STAR procedures (with advanced)	Advanced PBN functionality further supports flexibility of route placements in airspace design.			X						Implemented as per National PBN plan at all International aerodromes and selected domestic aerodromes	100%

Block 1 Modules	Module Title	Purpose	Need Analysis of Modules				Implementation Status				Remarks	Implemented
			Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented		

<p><b>APTA-B1/3</b></p>	<p><b>Performance based aerodrome operating minima – Advanced</b></p>	<p>Use of advanced features on aircraft permit operations using lower than standard minima on existing procedures. This builds on the Block 0 element for PB AOM (Advanced Aircraft) and</p>			<p>X</p>						<p>to be validated with airlines</p>	<p>0%</p>
<p><b>APTA-B1/4</b></p>	<p><b>CDO (Advanced)</b></p>	<p>Increase the ability CDO operations to contribute to terminal airspace efficiency.</p>			<p>X</p>			<p>X</p>			<p>In progress</p>	<p>50%</p>
<p><b>APTA-B1/5</b></p>	<p><b>CCO (Advanced)</b></p>	<p>Increase the ability CCO operations to contribute to terminal airspace efficiency.</p>			<p>X</p>			<p>X</p>			<p>In progress</p>	<p>50%</p>
<p><b>CSEP-B1/1</b></p>	<p><b>Basic airborne situational awareness during flight operations (AIRB)</b></p>	<p>To improve traffic situational awareness in all phases of flight.</p>			<p>X</p>					<p>X</p>	<p>Partially implemented - to be validated with operators</p>	<p>0%</p>

CSEP-B1/2	Visual Separation on Approach (VSA)	To assist pilots in maintaining own separation during successive visual approach procedures. VSA is defined to support aircraft			X						X	VSA implemented and facilitated on tactical basis.	100%
CSEP-B1/3	Performance Based Longitudinal Separation Minima	Reduced separation allowing more flights to operate in their optimum flight levels.									X	Not applicable - Current Oceanic traffic volumes and complexity does not warrant implementation	0%
CSEP-	Performance Based Lateral Separation	To increase airspace capacity and allow optimum									X	Not applicable - Current Oceanic traffic volumes and	0%