AIR NAVIGATION REPORT

ICAO Middle East Region

2022

ICAO

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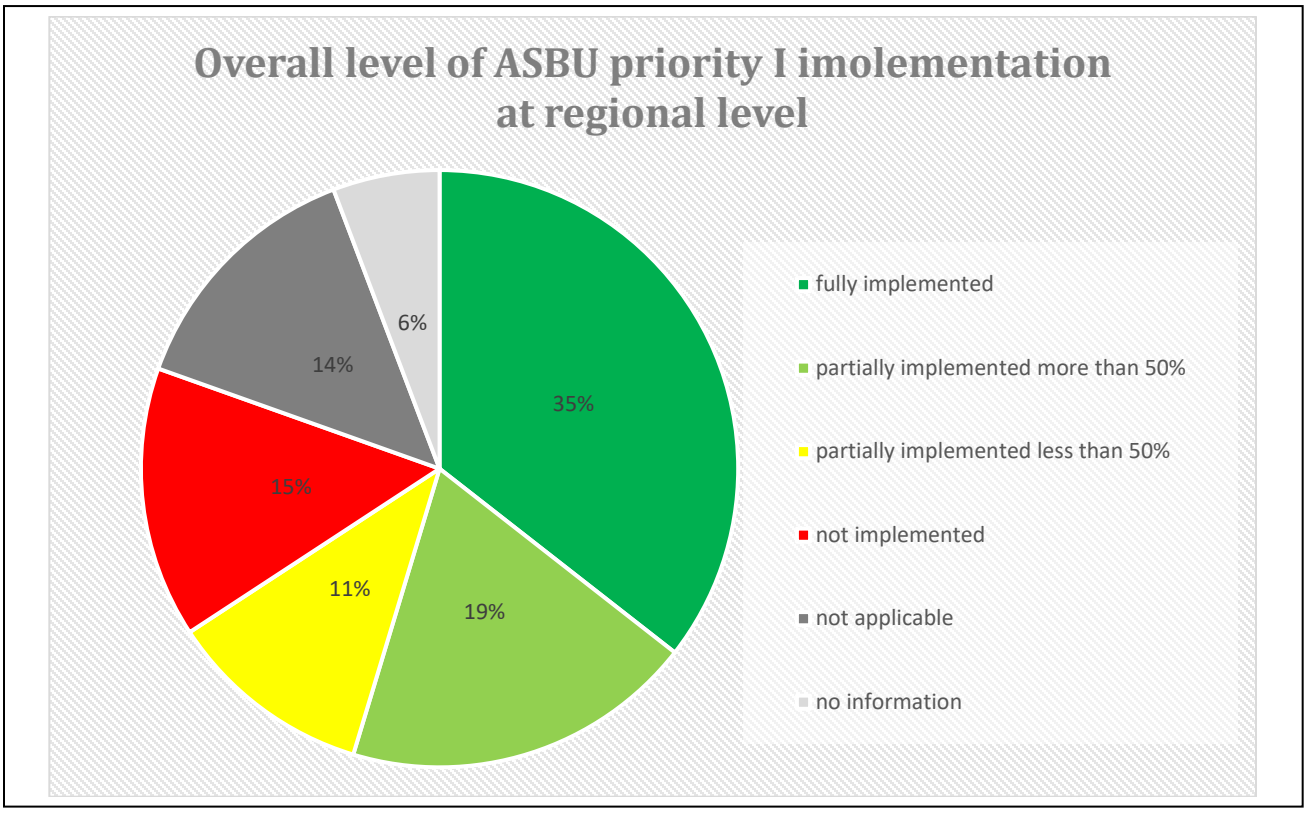
EXECUTIVE SUMMARY

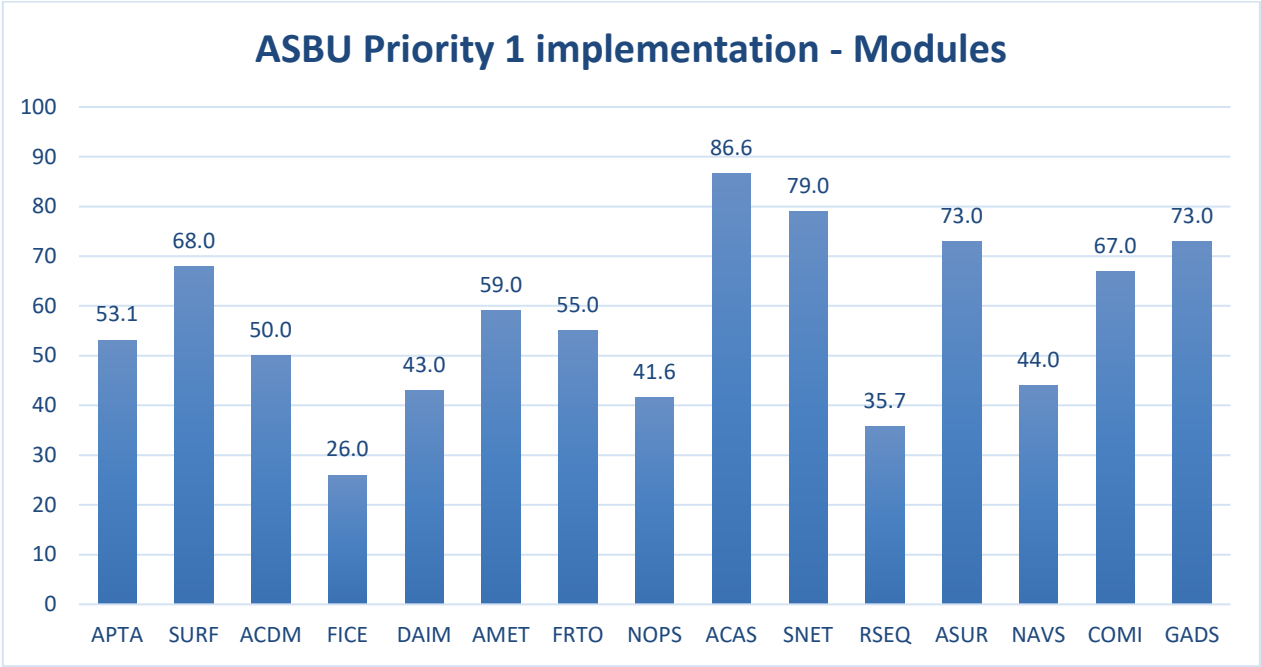
The ICAO MID Air Navigation Report - 2022 provides mainly an overview of the status of implementation of the Priority 1 ASBU Threads/ Elements in the MID Region.

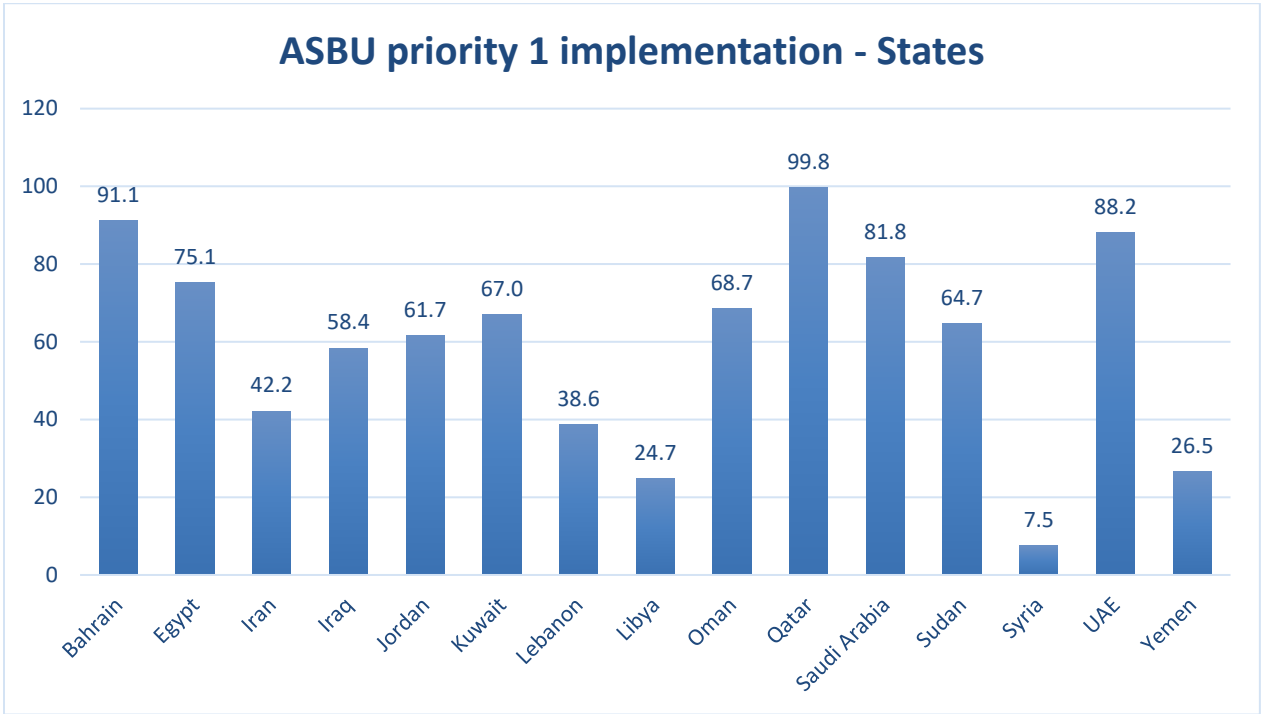
The overall implementation of priority 1 ASBU Threads/Elements in the MID Region is around **57%** in 2022. The MID Air Navigation Strategy (Edition February 2021) includes new Threads/ Elements that have been classified as Priority 1 for implementation in the MID Region. The implementation of some ASBU Threads has been acceptable/good; such as SURF, ACAS, SNET, ASUR and GADS. Nevertheless, some States are still facing challenges to implement the majority of the priority 1 Threads/Elements and are still far below the target.

The Overall Priority 1 ASBU Implementation in the MID States is as shown in the map below. Few States (Bahrain, Egypt, Qatar, Saudi Arabia & UAE) have a good implementation Status.

To summarize the implementation status and progress of ASBU priority 1 ASBU Threads/Elements, the following Implementation Dashboards present status and progress achieved in the implementation of each Thread and Elements by State.







Note 1 – utmost care was taken in the calculation of percentages, figures and numbers, however the statistics and graphs in this report should be considered as approximate.

1. INTRODUCTION

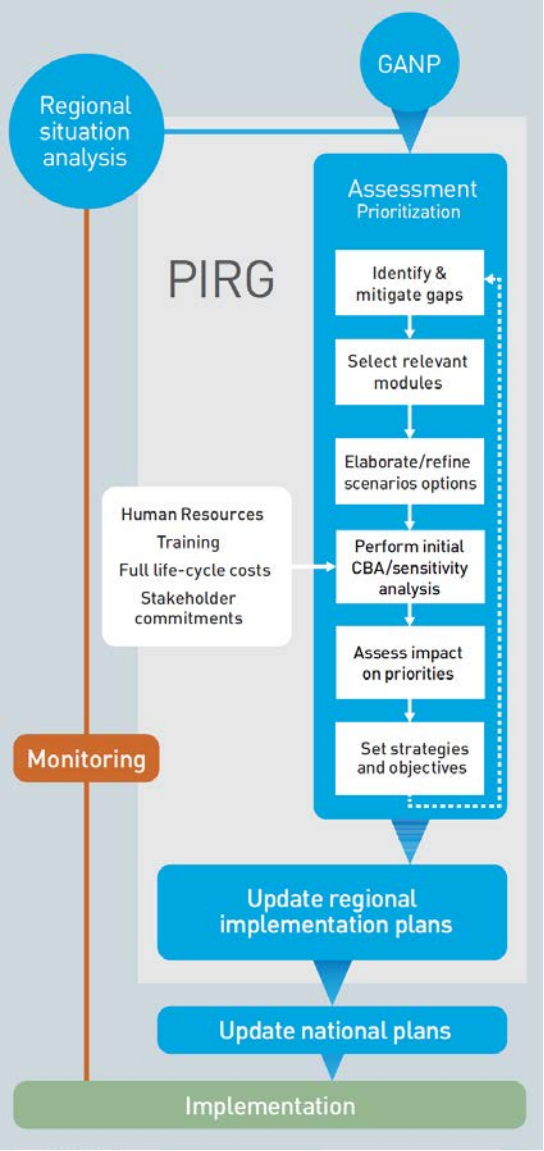
1.1 Objectives

The ICAO MID Region Air Navigation Report 2022 presents an overview of the planning and implementation progress for the Priority 1 ASBU Threads/Elements within the ICAO MID Region during the reporting period January till December 2022.

The implementation status data covers the fifteen (15) ICAO MID States.

GANP states that the regional national planning process should be aligned and used to identify those Modules which best provide solutions to the operational needs identified. Depending on implementation parameters such as the complexity of the operating environment, the constraints and the resources available, regional and national implementation plans will be developed in alignment with the GANP. Such planning requires interaction between stakeholders including regulators, users of the aviation system, the air navigation service providers (ANSPs), aerodrome operators and supply industry, in order to obtain commitments to implementation.

Accordingly, deployments on a global, regional and sub-regional basis and ultimately at State level should be considered as an integral part of the global and regional planning process through the Planning and Implementation Regional Groups (i.e. MIDANPIRG). The PIRG process will further ensure that all required supporting procedures, regulatory approvals and training capabilities are set in place. These supporting requirements will be reflected in regional online Air Navigation Plan (MID eANPs) developed by MIDANPIRG, ensuring strategic transparency, coordinated progress and certainty of investment. In this way, deployment arrangements including applicability dates can also be agreed and collectively applied by all stakeholders involved in the Region. The MID Region Air Navigation Report 2022 contains information on the implementation progress of the Priority 1 ASBU Threads/Elements of the MID Region Air Navigation Strategy (MID Doc 002 Edition February 2021) which is the key document for MIDANPIRG and its Subsidiary Bodies to monitor and analyze the implementation within the MID Region.



Regional Planning

1.2 Background

In accordance, with the Resolutions of the 40th Session of the ICAO Assembly, particularly Resolution A40-1 "ICAO global planning for safety and air navigation", the ICAO Assembly urged States and PIRGs to utilize the guidance provided in the GANP for planning and implementation activities which establish priorities, targets and indicators consistent with globally-harmonized objectives, taking into account operational needs. In response to this, the MID Region developed the MID Region Air Navigation Strategy, which is aligned with the GANP 6th Edition and ASBU Framework.

MIDANPIRG and its Subsidiary Bodies monitor the progress and the status of implementation of the following ASBU priority 1 Threads/Elements:

Thread	Element code	Title	Priority	Start Date	Monitoring		Remarks
					Main	Supporting	
Information Threads							
DAIM							
DAIM	**B1/1**	Provision of quality-assured aeronautical data and information	1	2021	AIM SG		It was B0, monitored earlier
	B1/3	Provision of digital terrain data sets	1	2021			It was B0, monitored earlier
	B1/4	Provision of digital obstacle data sets	1	2021			It was B0, monitored earlier
AMET							
AMET	**B0/1**	Meteorological observations products	1	2014	MET SG		
	B0/2	Meteorological forecast and warning products	1	2014	MET SG		
	B0/3	Climatological and historical meteorological products	1	2014	MET SG		
	B0/4	Dissemination of meteorological products	1	2014	MET SG	CNS SG	
FICE							
FICE	**B0/1**	Automated basic inter facility data exchange (AIDC)	1	2014	CNS SG ATM SG		
Operational Threads							
APTA							
APTA	**B0/1**	PBN Approaches (with basic capabilities)	1	2014		ATM SG AIM SG CNS SG	
	B0/2	PBN SID and STAR procedures (with basic capabilities)	1	2014		ATM SG AIM SG	
	B0/4	CDO (Basic)	1	2014		ATM SG	
	B0/5	CCO (Basic)	1	2014		ATM SG	
	B0/7	Performance based aerodrome operating minima – Advanced aircraft	1	2021	PBN SG	AIM SG	
FRTO							
	B0/2	Airspace planning and Flexible Use of Airspace (FUA)	1	2014		AIM SG	
		Level 1 Strategic	1	2014		AIM SG	

Thread	Element code	Title	Priority	Start Date	Monitoring		Remarks
					Main	Supporting	
		Airspace planning and Flexible Use of Airspace (FUA) Level 2	1	2014		AIM SG	
	B0/4	Basic conflict detection and conformance monitoring	1	2014		CNS SG	
NOPS							
NOPS	**B0/1**	Initial integration of collaborative airspace management with air traffic flow management	1	2015			
ACAS							
ACAS	**B1/1**	ACAS Improvements	1	2014	ATM SG CNS SG		It was B0, monitored earlier
SNET							
SNET	**B0/1**	Short Term Conflict Alert (STCA)	1	2017	ATM SG	CNS SG	
	B0/2	Minimum Safe Altitude Warning (MSAW)	1	2017	ATM SG	CNS SG	
	B0/3	Area Proximity Warning (APW)	1	2020	ATM SG	CNS SG	
GADS							
GADS	**B1/2**	Contact directory service	1	2021	CNS SG ATM SG		
RSEQ							
RSEQ	**B0/1**	Arrival Management	1	2021	ASPIG ATM SG	CNS SG	
SURF							
SURF	**B0/1**	Basic ATCO tools to manage traffic during ground operations	1	2014	ASPIG	ATM SG CNS SG	
	B0/2	Comprehensive situational awareness of surface operations	1	2014	ASPIG	ATM SG CNS SG	
	B0/3	Initial ATCO alerting service for surface operations	1	2021	ASPIG	ATM SG CNS SG	
ACDM							
ACDM	**B0/1**	Airport CDM Information Sharing (ACIS)	1	2014	ASPIG	CNS SG, AIM SG, ATM SG	
	B0/2	Integration with ATM Network function	1	2014	ASPIG	CNS SG, AIM SG, ATM SG	
	B1/1	Airport Operations Plan (AOP)	1	2021	ASPIG	CNS SG, AIM SG, ATM SG	
Technology Threads							
ASUR							
ASUR	**B0/1**	ADS-B	1	2021	CNS SG	ATM SG ASPIG	

Thread	Element code	Title	Priority	Start Date	Monitoring		Remarks
					Main	Supporting	
	B0/2	MLAT	1	2021	CNS SG	ATM SG ASPIG	
	B0/3	SSR-DAPS	1	2021	CNS SG	ATM SG ASPIG	
NAVS							
NAVS	**B0/3**	Aircraft Based Augmentation Systems (ABAS)	1	2021	CNS SG	PBN SG ATM SG AIM SG	
	B0/4	Navigation Minimal Operating Networks (Nav. MON)	1	2021	CNS SG	PBN SG	
COMI							
COMI	**B0/7**	AMHS	1	2014	CNS SG		
	B1/1	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS)	1	2021	CNS SG		

The MID Region Air Navigation Report is an integral part of the air navigation planning and implementation process in the MID Region; and the main tool for the monitoring and assessing the implementation of Air Navigation Systems and ASBUs in the MID Region.

1.3 Scope

This MID Air Navigation Report 2022 addresses the implementation status of the priority 1 ASBU Threads/Elements for the reference period January 2022 to December 2022.

The Report covers the fifteen (15) ICAO MID States: Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Sudan, Syria, United Arab Emirates and Yemen.

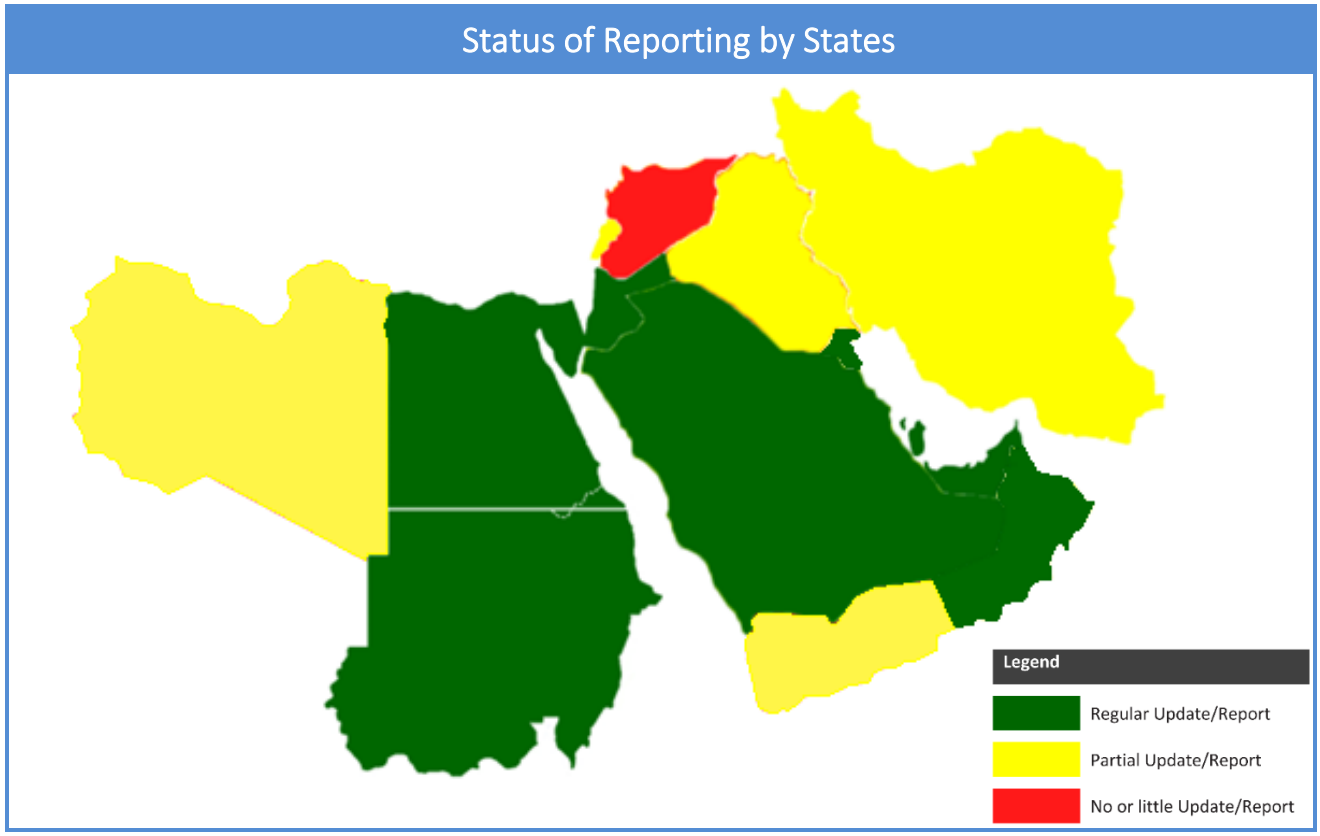
ICAO MID Region

1.4 Collection of Data

For the purpose of collecting necessary data for the MID Air Navigation Report-2022, a State Letter Ref.: AN 1/7 – 22/116 was issued on 6 June 2022, to follow-up on the MIDANPIRG Conclusion 19/6, which urged States to provide relevant data necessary for the development of the MID Region Air Navigation Report-2022. However, some States did not respond to the State Letter. The status of reporting by States is shown in the following map.

Data collected from States was complemented by some updates provided mainly through the MIDANPIRG Subsidiary Bodies and the MID eANP Volume III.

Where the required data was not provided, it is indicated in the Report by color coding (Missing Data).



1.5 Structure of the Report

Executive Summary provides an overall review of the ASBU implementation in the MID Region.

Section 1 (Introduction) presents the objective and background of the report as well as the scope covered and method of data collection.

Section 2 lists the priority 1 ASBU Threads/Elements in the MID Region and presents the status of their implementation and their progress in graphical and numeric form.

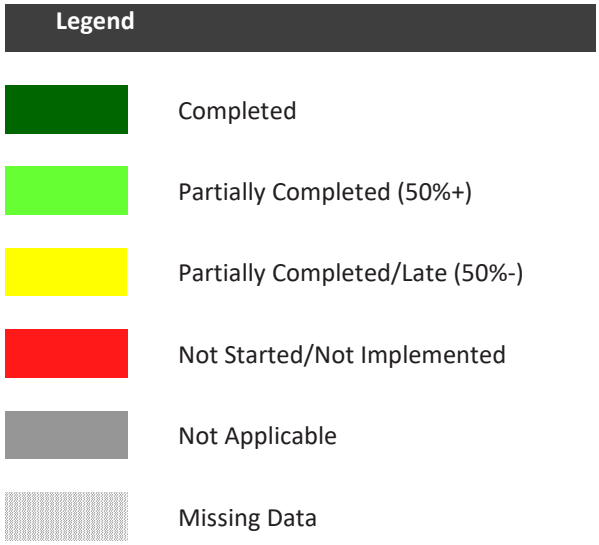
Conclusion

Appendix A provides detailed status of the implementation of Priority 1 ASBU Threads for the MID States.

2. STATUS AND PROGRESS OF ASBU IMPLEMENTATION

This chapter of the report gives an overview of the implementation progress for each of the Priority 1 ASBU Elements belonging to a particular ASBU Thread.

The following color scheme is used for illustrating the status of implementation:



Note – Missing data is excluded in the calculation of the average regional status of implementation.

2.1 ASBU Implementation Status and Progress in the MID Region

2.1.1 B0-APTA

Procedures implemented as STARS in terminal airspace provide lateral path guidance to support improving the efficiency in the descent phase of flight by enabling near idle power operations from top of descent, to a point where the aircraft transitions to approach operations. For takeoff, SIDS provide a lateral path that can support continuous climb operations to the top of climb where the cruise phase of flight starts.

Enhanced STARS and SIDS with altitude constraints along the lateral path improve ATC management, and further support operational efficiency by providing vertical profiles that all aircraft can follow.

Performance based aerodrome operating minima (PB AOM) allows for implementation of vertically guided approaches at a wider range of aerodromes, and facilitates a phased approach to improvement in approach capabilities. Advanced aircraft with technology such as Enhanced Vision Systems (EVS) benefit from operational credits to continue operations below normal minima.

B0 – APTA				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
APTA B0/1 PBN Approaches (with basic capabilities)	All RWYs Ends at International Aerodromes	Indicator: % of Runway ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) Supporting metric: Number of Runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	100%	Dec 2017
APTA B0/2 PBN SID and STAR procedures (with basic capabilities)	All RWYs ENDs at International Aerodromes	Indicator: % of Runway ends at international aerodromes provided with PBN SID and STAR (basic capabilities). Supporting Metric: Number of Runway ends at international aerodromes provided with PBN SID and STAR (basic capabilities).	70%	Dec 2022
APTA B0/4 CDO (Basic)	OBBI, OIIE, OIKB, OIFM, OJAI, OLBA, OOMS, OTHH, OTBD, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMAL, OMAD, OMDW, OMDB, OMSJ, OMRK and OMFJ	Indicator*: % of International Aerodromes with CDO implemented as required. Supporting Metric: Number of International Aerodromes with CDO implemented as required. *As per the applicability area	100%	Dec 2021

APTA B0/5 CCO (Basic)	OBBI, OIIE, OIKB, OIFM, OJAI, OLBA, OOMS, OTHH, OTBD, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMAL, OMAD, OMDW, OMDB, OMSJ, OMRK and OMFJ	Indicator*: % of International Aerodromes with CCO implemented as required. Supporting Metric: Number of International Aerodromes with CCO implemented as required. *As per the applicability area	100%	Dec 2021
APTA B0/7 Performance based aerodrome operating minima – Advanced aircraft	All States	Indicator: % of States authorizing Performance-based Aerodrome Operating Minima for Air operators operating Advanced aircraft. Supporting Metric: Number of States authorizing Performance-based Aerodrome Operating Minima for Air operators operating Advanced aircraft.	50%	Dec 2021

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-APTA	B0/1															
	B0/2															
	B0/4															
	B0/5															
	B0/7															

Average Regional Implementation is **58%**.

2.1.2 B0-SURF

This module aims to enhance the situational awareness of Air Traffic Controllers and pilots during ground operations by the provision of the aerodrome surface situation on their respective displays being A-SMGCS for the controller or electronic maps in the cockpit. Some initial alerting services for prevention of runway incursions are proposed to the controller..

B0-SURF				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
SURF-B0/1 Basic ATCO tools to manage traffic during ground operations	All International Aerodromes	Indicator: % of Aerodromes having implemented Basic ATCO tools to manage traffic during ground operations Supporting metric: Number of Aerodromes having implemented Basic ATCO tools to manage traffic during ground operations	100%	Dec 2021
SURF-B0/2 Comprehensive situational awareness of surface operations	OBBI, HECA, OIII, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OEMA, OMDB, OMAA.	Indicator*: % of Airports having implemented the surveillance service of A-SMGCS Supporting metric: Number of Airports having implemented the surveillance service of A-SMGCS * As per the applicability area	80%	Dec 2021
SURF-B0/3 Initial ATCO alerting service for surface operations	OBBI, HECA, OIII, OOMS, OTBD, OTHH, OEDF, OEJN, OERK, OEMA, OMDB, OMAA.	Indicator*: % of Airports having implemented the A-SMGCS alerting service. Supporting metric: Number of Airports having implemented the A- SMGCS alerting service * As per the applicability area	80%	Dec 2021

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B0-SURF	B0/1															
	B0/2															
	B0/3															

Average Regional Implementation is **68%**.

2.1.3 B0 & 1-ACDM

B0: 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. 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 snow plan, 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.

B1: Aerodromes are integrated within the ATM Network, from the strategic through all tactical phases. Situational awareness and decision support information is made available to affected stakeholders to establish a common understanding of the various needs and capabilities and make adjustments to assets in order to cope with these needs. Support mechanisms include an Airport Operations Planning (AOP) and an Airport Operations Centre (APOC).

B0 & 1-ACDM				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
ACDM B0/1 Airport CDM Information Sharing (ACIS)	OBBI, OIII, OKBK, OOMS, OTHH, OEJN, OERK, OMDB, OMAA	Indicator*: % of Airports having implemented ACIS Supporting metric: number of Airports having implemented ACIS * As per the applicability area	50%	Dec 2021
ACDM B0/2 Integration with ATM Network function	OBBI, OIII, OKBK, OOMS, OTHH, OEJN, OERK, OMDB, OMAA.	Indicator*: % of Airports having integrated ACDM with the ATM Network function. Supporting metric: Number of Airports having integrated ACDM with the ATM Network function * As per the applicability area	50%	Dec 2022
ACDM B1/1 Airport Operations Plan (AOP)	OBBI, OIII, OKBK, OOMS, OTHH, OEJN, OERK, OMDB, OMAA.	Indicator*: % of Airports having implemented an Airport Operations Plan (AOP) Supporting metric: having implemented an Airport Operations Plan (AOP) * As per the applicability area	50%	Dec 2021

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-ACDM	B0/1															
	B0/2															
B1-ACDM	B1/1															

Average Regional Implementation is **42%**.

2.1.4 B0-FICE

To improve coordination between air traffic service units (ATSUs) by using ATS interfacility flight data communication. The benefit is the improved efficiency through digital transfer of flight data.

B0–FICE				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
FICE B0/1 Automated basic inter facility data exchange (AIDC)	According to the MID Region AIDC/OLDI Priority 1 Applicability Area at Attachment A	Indicator*: % of priority 1 AIDC/OLDI Interconnection have been implemented Supporting metric: Number of AIDC/OLDI interconnections implemented between adjacent ACCs	70%	Dec 2020

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-FICE	B0/1															

Average Regional Implementation is **26%**.

2.1.5 B1-DAIM

Improved aeronautical information based on enhanced data quality (accuracy, resolution, integrity, timeliness, traceability, completeness, format) to support Performance-Based Navigation (PBN), airborne computer-based navigation systems and ground automation. In addition, digital exchange and processing of aeronautical information allows a more efficient management of information by avoiding reliance on manual processing and manipulation.

B1–DAIM				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
DAIM B1/1 Provision of quality-assured aeronautical data and information	All States	Indicator*: Regional average implementation status of DAIM B1/1 (provision of quality-assured aeronautical data and information). Supporting Metrics: 1. Number of States that have implemented QMS for AIS/AIM 2. Number of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) and have implemented WGS-84 Geoid Undulation 3. Number of States that are compliant with the requirements of AIRAC adherence, 4. Number of States that have implemented an AIXM-based AIS database (AIXM V5.1+) 5. Number of States that have established formal arrangements with at least 50% of their AIS data originators.	80%	Dec 2021
DAIM B1/3 Provision of digital terrain data sets	All States	Indicator*: Regional average implementation status of DAIM B1/3(Provision of Terrain digital datasets). Supporting Metric: Number of States that provide required Terrain digital datasets	60%	Dec 2021
DAIM B1/4 Provision of digital obstacle data sets	All States	Indicator*: Regional average implementation status of DAIM B1/4(Provision of obstacle digital datasets). Supporting Metric: Number of States that provide required obstacle digital datasets	60 %	Dec 2021

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B1-DAIM	B1/1															
	B1/3															
	B1/4															

Average Regional Implementation is **47%**.

2.1.6 B0-AMET

Global, regional and local meteorological information to support flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.

B0–AMET				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
AMET B0/1 Meteorological observations products	All states	Indicator*: Regional average implementation status of B0/1 (Meteorological observations products). Supporting Metrics: Number of States that provide the following Meteorological observations products, as required: 1. Automatic Weather Observation System (AWOS) information (including real-time exchange of wind and RVR data) 2. Local reports (MET REPORT/SPECIAL) 3. Aerodrome reports (METAR/SPECI) 4. Lightning Information 5. Ground-based weather radar information 6. Meteorological satellite imagery 7. Aircraft meteorological report (ie. ADS-B, AIREP, etc.) 8. Vertical wind and temperature profiles Wind shear alerts	80%	Dec 2021
AMET B0/2 Meteorological forecast and warning products	All states	Indicator*: Regional average implementation status of B0/2 (Meteorological forecasts and warning products) Supporting Metrics: Number of States that provides the following Meteorological forecast and warning products, as required: 1. World Area Forecast System (WAFS) gridded products 2. Significant Weather (SIGWX) 3. Aerodrome Forecast (TAF) 4. Trend Forecast (TREND) 5. Take-off Forecast 6. SIGMET 7. Aerodrome Warning 8. Wind Shear Warning	90%	Dec 2021
AMET B0/3 Climatological and historical meteorological products	All states	Indicator: % of States that provide Climatological and historical meteorological products, as required. Supporting Metric: Number of States that provide Climatological and historical meteorological products, as required	85%	Dec 2021

AMET B0/4 Dissemination of meteorological products	All states	Indicator: % of States disseminating Meteorological products using a variety of formats and means (TAC, Gridded, Graphical, BUFR code, IWXXM) Supporting Metric: Number of States disseminating Meteorological products using a variety of formats and means (TAC, Gridded, Graphical, BUFR code, IWXXM)	85%	Dec 2021

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-AMET	B0/1															
	B0/2															
	B0/3															
	B0/4															

Average Regional Implementation is **55%**.

2.1.7 B0-FRTO

En-route trajectories are enhanced by using more direct routings, and collaborative airspace management process and tools. ATCOs are assisted by tools for the conflict identification and conformance monitoring.

B0–FRTO				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
FRTO B0/2 Airspace planning and Flexible Use of Airspace (FUA)	Bahrain, Egypt, Jordan, Qatar, Saudi Arabia (2 ACCs), Sudan, UAE	Indicator*: % of ACCs using and implementing appropriate means (procedures and tools (automation)) to support Airspace planning and FUA and improve data exchange between Civil and Military to improve efficiency of Airspace. Supporting metric: Number of ACCs using and implementing appropriate means (procedures and tools (automation)) to support Airspace planning and FUA and improve data exchange between Civil and Military to improve efficiency of Airspace. * As per the applicability area	50%	Dec 2022
FRTO B0/4 Basic conflict detection and conformance monitoring	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia (2 ACCs), Sudan, UAE	Indicator*: % States that implemented MTCD and MONA, for ACCs, as required. Supporting metric: The number of States that implemented MTCD and MONA for ACCs, as required. * As per the applicability area	70%	Dec 2021

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi**	**Sudan**	**Syria**	**UAE**	**Yemen**
B0-FRTO	B0/2															
	B0/4															

Average Regional Implementation is **55%**.

2.1.8 B0-NOPS

The Air Traffic Flow Management (ATFM) is used to manage the flow of traffic in a way that minimizes delay and optimises the use of the entire airspace and available capacity. The management of airspace starts to be integrated with the management of the traffic flows. Some main processes are automated, however substantial procedural support is still required to balance demand with available capacity. Collaborative ATFM can manage traffic flows by:

- smoothing flows and managing rates of sector entry;
- re-route traffic to avoid flow constraint areas;
- level capping;
- collaborative airspace management;
- ATFM slot management including departure information planning;
- adjust flow measures by use of enhanced collaborative flight planning and enhanced tactical flow management.

B0–NOPS				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
NOPS B0/1 Initial integration of collaborative airspace management with air traffic flow management	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE	Indicator*: % of States implementing ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace management and air traffic flow and capacity management process Supporting metric: number of States implementing ASM/ATFM techniques, procedures and tools for the initial establishment of an integrated collaborative airspace management and air traffic flow and capacity management process. * As per the applicability area	50%	Dec 2022

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi	Sudan	Syria	UAE	Yemen
B0-NOPS	B0/1															

Average Regional Implementation is **42%**

2.1.9 B1-ACAS

The traffic alert and collision avoidance system (TCAS) version 7.1 provides short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts as well as enhancing the logic for some geometries (i.e., Uberlinghen accident). This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation.

B1–ACAS				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
ACAS B1/1 ACAS Improvements Operational	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	100%	Dec 2017

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B1-ACAS	B1/1															

Average Regional Implementation is **86.7%.**

2.1.10 B0-SNET

Ground Based Safety Nets are an integral part of the ATM system using primarily ATS surveillance data with warning times of up to two minutes. Upon receiving an alert, air traffic controllers are expected to immediately assess the situation and take appropriate action if necessary.

The goal of current Ground Based Safety Nets is collision avoidance, or the avoidance of collision with terrain or obstacles, or to warn the controllers of the unauthorized penetration of an airspace.

Alerts from short- term conflict alert (STCA), area proximity warnings (APW), minimum safe altitude warnings (MSAW) and approach path monitoring (APM) are proposed.

Ground-Based Safety Nets do not change the way air traffic controllers perform their work and have no influence on the calculation of the sector capacity.

B0–SNET				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
SNET B0/1 Short Term Conflict Alert (STCA)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE	Indicator*: % of States that have implemented Short-term conflict alert (STCA) Supporting metric: number of States that have implemented Short-term conflict alert (STCA) * As per the applicability area	80 %	Dec 2018
SNET B0/2 Minimum Safe Altitude Warning (MSAW)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, Syria, UAE	Indicator*: % of States that have implemented Minimum safe altitude warning (MSAW) Supporting metric: number of States that have implemented Minimum safe altitude warning (MSAW) * As per the applicability area	80 %	Dec 2018
SNET B0/3 Area Proximity Warning (APW)	Bahrain, Egypt, Iran, Iraq, Kuwait, Jordan, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE	Indicator*: % of States that have implemented Area Proximity Warning (APW) for ACCs, as required Supporting metric: number of States that have Implemented Area Proximity Warning (APW) for ACCs, as required * As per the applicability area	70%	Dec 2021

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B0-SNET	B0/1															
	B0/2															
	B0/3															

Average Regional Implementation is **79%**.

2.1.11 B0-RSEQ

Arriving flights are "metered" and sequenced by arrival ATC based on inbound traffic predication information, optimizing runway utilization. Also departures are sequenced allowing improved start/push-back clearances, reducing the taxi time and ground holding, delivering more efficient departure sequences and reduce surface congestion.

B0–RSEQ				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
RSEQ B0/1 Arrival Management	OBBI, HECA, HEBA, HELX, HESN, HESH, OTBD, OTHH, OEJN, OEDF, OEMA, OERK OMDB, OMAA	Indicator*: % of Aerodromes that have implemented arrival manager (AMAN), where required/applicable Supporting Metric: Number of Aerodrome that have implemented arrival manager (AMAN), where required/ applicable * As per the applicability area	80%	Dec 2022

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B0-RSEQ	B0/1															

Average Regional Implementation is **36%**.

2.1.12 B0-ASUR

Surveillance is provided supported by new technologies such as ADS-B OUT and wide area multilateration (MLAT) systems. These capabilities will be used in various ATM services, e.g., traffic information, search and rescue, and separation provision. ADS-B OUT and MLAT systems complement existing cooperative surveillance radar and may be deployed independently or together. Depending on local airspace needs, ADS-B or MLAT may replace cooperative radar.

B0–ASUR				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
ASUR B0/1 Automatic Dependent Surveillance – Broadcast (ADS-B)	(Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Saudi Arabia, Qatar, Sudan, UAE)	Indicator*: % of States that have implemented ADS-B to improve surveillance coverage/capabilities Supporting Metric: Number of States that have implemented ADS-B to improve surveillance coverage/capabilities * As per the applicability area	80%	Dec 2022
ASUR B0/2 Multilateration cooperative surveillance systems (MLAT)	Bahrain, Egypt, Jordan, Kuwait, Oman, Saudi Arabia, Qatar, UAE	Indicator*: % of States that have implemented Multi-lateration (M-LAT) Supporting Metric: Number of States that have implemented Multi-lateration (M-LAT) * As per the applicability area	80%	Dec 2022
ASUR B0/3 Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)	Bahrain, Egypt, Iran, Iraq, Kuwait, Lebanon, Jordan, Oman, Qatar, Saudi Arabia, Sudan and UAE	Indicator*: % of States that have implemented Downlink of Aircraft Parameters (SSR-DAPS) Supporting Metric: Number of States that have implemented Downlink of Aircraft Parameters (SSR-DAPS) * As per the applicability area	80%	Dec 2021

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B0-ASUR	B0/1															
	B0/2															
	B0/3															

Average Regional Implementation is **73%**.

2.1.13 B0-NAVS

GBAS is provided to support precision approach and landing operations at a specific airport, in particular Category I operation utilizing GBAS Approach Service Type C (GAST-C), with the improved accuracy, integrity, and availability of satellite navigation.

SBAS and ABAS are implemented as a mean to comply with ICAO Assembly Resolution A37-11 regarding Vertically-Guided Approach. SBAS is provided to support PBN in all phases of flight with increased accuracy and integrity. ABAS is provided to support non-precision (LNAV) and vertically-guided approach with Baro-VNAV as well as other terminal and en-route navigations.

Rationalization of conventional navigation aid infrastructure through Minimal Operating Networks starts to happen and supports a reduction in the number of NDBs, VORs, and, where appropriate in some States, ILS. Alternative Positioning, Navigation, and Timing is based upon a combination of existing ground navaids, airborne inertial systems and ATC procedures.

B0–NAVS				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
NAVS B0/3 Aircraft Based Augmentation Systems (ABAS)	All States	Indicator: % of States requiring Aircraft Based Augmentation System (ABAS) equipage for aircraft with a max certificated take-off mass greater than 5,700 Kg to enable PBN Operations Supporting metric: Number of States requiring Aircraft Based Augmentation System (ABAS) equipage for aircraft with a max certificated take-off mass greater than 5,700 Kg to enable PBN Operations	70%	Dec 2021
NAVS B0/4 Navigation Minimal Operating Networks (Nav. MON)	All States	Indicator: % of States that have developed a plan of rationalized conventional NAVAIDS network to ensure the necessary levels of resilience for navigation Supporting metric: Number of States that have developed a plan of rationalized conventional NAVAIDS network to ensure the necessary levels of resilience for navigation	70%	Dec 2022

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B0-NAVS	B0/3															
	B0/4															

Average Regional Implementation is **44%**.

2.1.14 B0-COMI

B0: Air-Ground
VHF, HF and SATCOM \Communications:

- VHF Voice Communications remains the primary means of information exchange in most regions.
- Continued use of the ACARS Network to support the distribution of ATS message sets (FANS)
- Introduction of the ATN/OSI Network to to support B1
- Continued use of VDL Mode 2 to support ATN/OSI and FANS.
- Continued use of SATCOM Class C, VDL Mode0/A and VDL Mode 2 as Datalinks to support Terrestrial, Oceanic and Remote Airspace and as a complement to voice and in order to reduce voice channel congestion and increase capacity.
- Continued use of HFDL as the Datalink to support Oceanic Airspace as a complement to voice and in order to reduce voice channel congestion and increase capacity.

Ground-Ground
Deployment of IP based AMHS linked service:

- as an improvement over AFTN in term of bandwidth and length of the message,
- as a mean to enhance traffic transfer between ANSPs by expanding the use of ATS Inter-Facility Communication Data (AIDC) to improve efficiency of air traffic management by reducing the use of ATS voice service.

B1: Air-Ground
Improved Terrestrial Data Communications:

- VHF Voice Communications remains the primary means of information exchange in most regions.
- Introduction of the VDL Mode 2 Multi-Frequency design to accommodate increased capacity and reduce interference.
- Introduction of the New SATCOM Class B Satellite Datalinks to increase performance and deliver increased ATN/OSI and ACARS network connectivity.

Ground-Ground
Introduction of IP based network to replace point-to-point circuits:

- AMHS with extension service to support XML, FTBP (IWXMM).
- Expansion of AIDC to enhance efficiency and safety.
- Implement regional IP networks.
- AeroMACS circuits for airport local communications.

B0–COMI				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
COMI B0/7 ATS Message Handling System (AMHS)	All States	Indicator: % of States that have established AMHS interconnections with adjacent COM Centres Supporting metric: Number of States that have established AMHS interconnections with adjacent COM Centres	90%	Dec 2020
COMI B1/1 Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS)	All States	Indicator: % of States that have established National IP Network for voice and data communication Supporting metric: Number of States that have established National IP Network for voice and data communication	80%	Dec 2021

Module	Elements	Bahrain	Egypt	Iran	Iraq	Jordan	Kuwait	Lebanon	Libya	Oman	Qatar	Saudi Arabia	Sudan	Syria	UAE	Yemen
B0-COMI	B0/7															
B1-COMI	B1/1															

Average Regional Implementation is **67%**.

2.1.15 B1-GADS

In oceanic areas without automatic surveillance, ATSU Alerting Service is supported with aircraft tracking capability implemented by the aircraft operator. Point of Contact (PoC) information is provided to facilitate establishing contact between relevant Stakeholders in emergency situations.

B1–GADS				
Elements	**Applicability**	**Performance Indicators/Supporting Metrics**	**Targets**	**Timelines**
GADS B1/2 Contact directory service	All States	Indicator: % of States that provided GADSS Point of Contact (PoC) information Supporting Metric: Number of States that provided GADSS Point of Contact (PoC) information	100%	Dec 2021

Module	**Elements**	**Bahrain**	**Egypt**	**Iran**	**Iraq**	**Jordan**	**Kuwait**	**Lebanon**	**Libya**	**Oman**	**Qatar**	**Saudi Arabia**	**Sudan**	**Syria**	**UAE**	**Yemen**
B0-GADS	B1/2															

Average Regional Implementation is 73%.

3. CONCLUSION

The overall implementation of priority 1 ASBU Threads/Elements in the MID Region is around **57%** compared to 58% in 2021. The decrease is due mainly to the identification of priority 1 ASBU elements. The implementation of some modules has been acceptable/good; such as ACAS, ASUR, GADS and SNET. Nevertheless, some States are still facing challenges to implement the majority of the priority 1 ASBU Elements.

The status of implementation of the priority 1 ASBU Elements also shows that Bahrain, Qatar, Saudi Arabia and UAE made a good progress.

For an improved quality and accuracy of the future MID Air Navigation Reports, States are strongly encouraged to provide the ICAO MID Office in a timely manner with the necessary data related to the planning, implementation and monitoring of the performance of their air navigation system, including the status of implementation of the ASBU Threads/Elements identified as priority 1 either at Regional or National Level.

APPENDIX A: OVERALL STATUS OF PRIORITY 1 ASBU THREADS

	APTA	SURF	ACDM	FICE	DAIM	AMET	FRTO	NOPS	ACAS	SNET	RSEQ	ASUR	NAVS	COMI	GADS	Average
Bahrain	85	100	67	40	100	100	100	100	100	100	100	100	75	100	100	91.13
Egypt	40	100	50	25	37.6	87.5	50	0	100	90	0	66.6	50	100	100	75.14
Iran	24	33	0	0	71	19			100	67		50		0	100	42.18
Iraq	7	100		0	6.6	45.5		0	100	67		100	75	100	100	58.42
Jordan	55	100		0	33.3	97	50	0	100	100		66.6	0	100	100	61.68
Kuwait	100	100	0	0	71	83		0	100	100		66.6	50	50	0	66.96
Lebanon	30	100		0	20	19			100	67		0		50	0	38.6
Libya	20	50			0	3			0					0	100	24.71
Oman	60	33.3	50	25	26.6	100	100	100	100	100		66.6	0	100	100	68.67
Qatar	100	100	100	100	100	97	100	100	100	100	100	100	100	100	100	99.8
Saudi Arabia	100	83	50	14	83.3	96	100	100	100	100	0	100	100	100	100	81.75
Sudan	45	100		0	33.3	31		0	100	67		100	100	100	100	64.69
Syria	2.5	50			0	0			0					0	0	7.5
UAE	100	100	75	75	55.5	93.75	50	100	100	67	100	100	100	100	100	88.16
Yemen	29	50			6.6	0			100					0	0	26.51
Average regional implementation	53.14	68	50	26	43	59	55	41.6	86.6	79	35.7	73	44	67	73	56.93

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