AIR NAVIGATION REPORT

ICAO Middle East Region

2023

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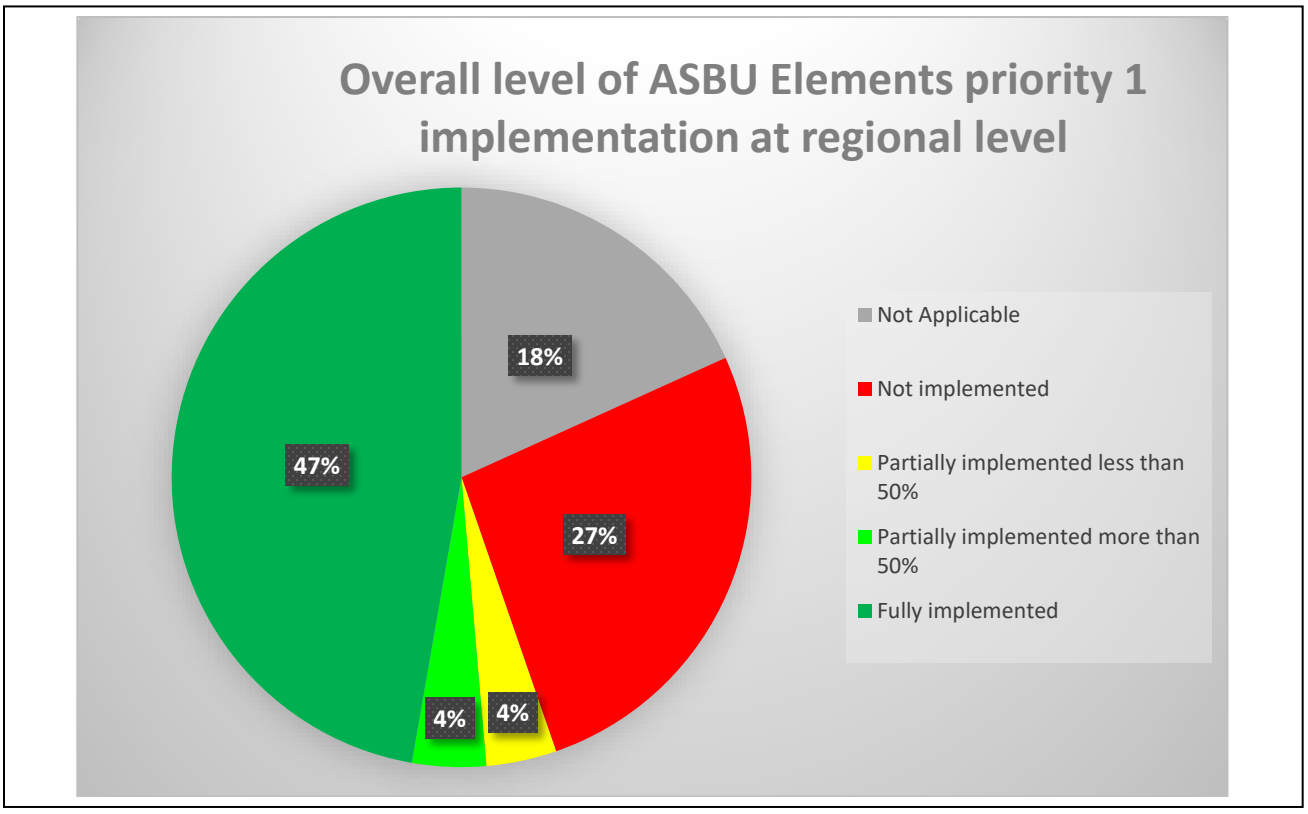
EXECUTIVE SUMMARY

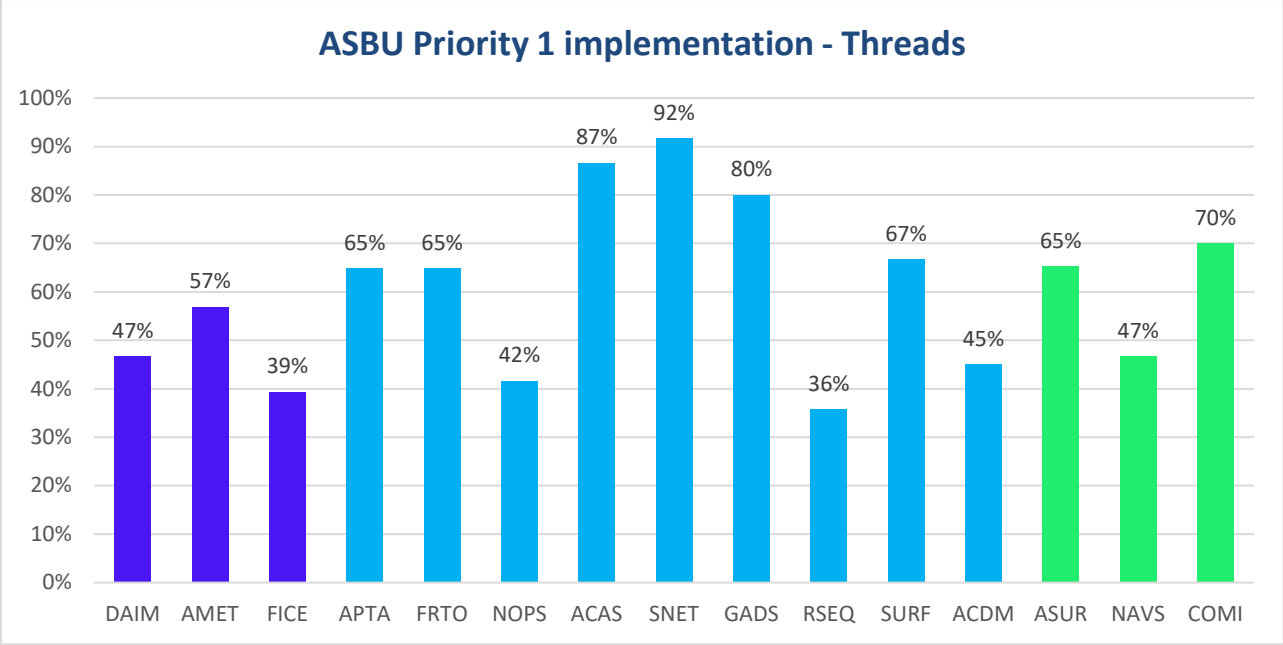
The ICAO MID Air Navigation Report - 2023 provides mainly an overview of the status of implementation of the Priority 1 ASBU Threads/ Elements in the MID Region.

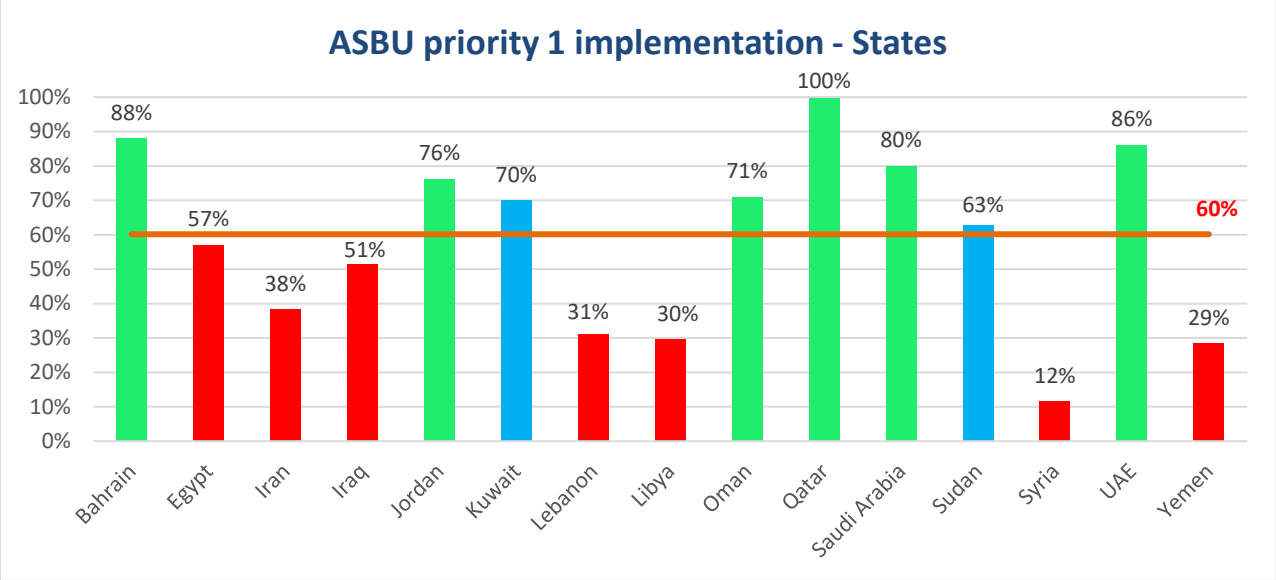
The overall implementation of priority 1 ASBU Threads/Elements in the MID Region is around **60.14%** in 2023. The MID Air Navigation Strategy (Edition March 2023) includes new Threads/ Elements that have been classified as Priority 1 for implementation in the MID Region. The implementation of some ASBU Threads has been acceptable/good (More than 70% per applicability area); such as, ACAS, SNET, COMI and GADS. Nevertheless, some States are still facing challenges to implement the majority of the priority 1 Threads/Elements and are still below the target.

The Overall Priority 1 ASBU Implementation in the MID States is as shown in the map below. Some States (Bahrain, Jordan, Oman, Qatar, Saudi Arabia & UAE) have a good implementation Status (more than 70%).

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

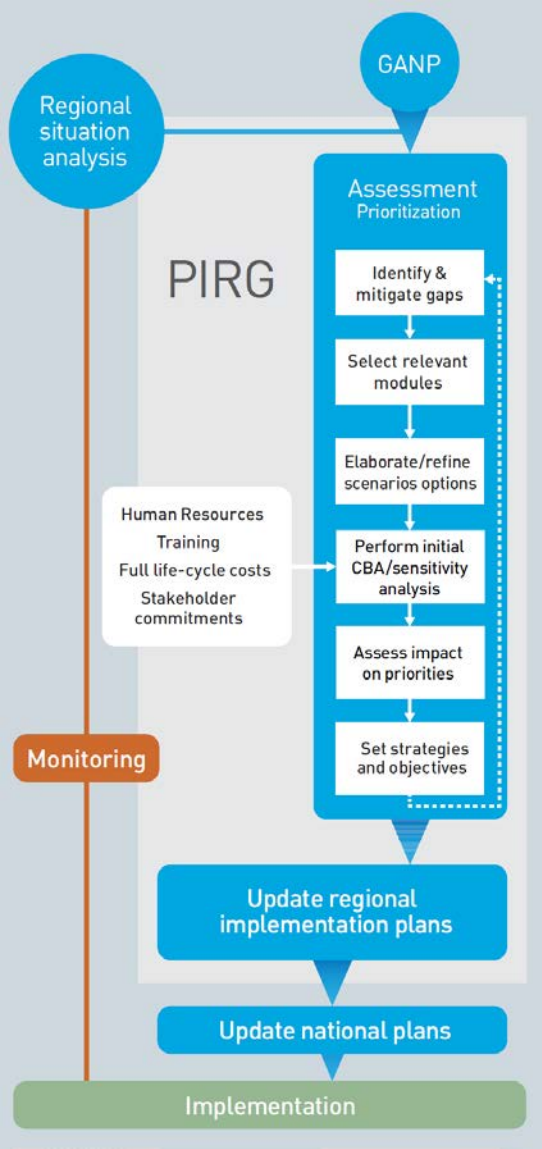
1.1 Objectives

The ICAO MID Region Air Navigation Report 2023 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 2023.

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 2023 contains information on the implementation progress of the Priority 1 ASBU Threads/Elements of the MID Region Air Navigation Strategy (MID Doc 002 Edition March 2023) 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 7th 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	RANP/ NANP TF	
	B1/3	Provision of digital terrain data sets	1	2021	AIM SG	RANP/ NANP TF	
	B1/4	Provision of digital obstacle data sets	1	2021	AIM SG	RANP/ NANP TF	
AMET							
AMET	**B0/1**	Meteorological observations products	1	2014	MET SG	RANP/ NANP TF	
	B0/2	Meteorological forecast and warning products	1	2014	MET SG	RANP/ NANP TF	
	B0/3	Climatological and historical meteorological products	1	2014	MET SG	RANP/ NANP TF	
	B0/4	Dissemination of meteorological products	1	2014	MET SG	CNS SG, RANP/ NANP TF	
FICE							
FICE	**B0/1**	Automated basic inter facility data exchange (AIDC)	1	2014	CNS SG ATM SG	RANP/ NANP TF	
Operational Threads							
APTA							
APTA	**B0/1**	PBN Approaches (with basic capabilities)	1	2014	PBN SG	ATM SG, AIM SG, CNS SG, RANP/ NANP TF	
	B0/2	PBN SID and STAR procedures (with basic capabilities)	1	2014	PBN SG	ATM SG, AIM SG, RANP/ NANP TF	
	B0/4	CDO (Basic)	1	2014	PBN SG	ATM SG, RANP/ NANP TF	
	B0/5	CCO (Basic)	1	2014	PBN SG	ATM SG, RANP/ NANP TF	
	B0/7	Performance based aerodrome operating minima – Advanced aircraft	1	2021	PBN SG	AIM SG, CNS SG, ASPIG, RANP/ NANP TF	
FRTO							

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

Thread	Element code	Title	Priority	Start Date	Monitoring		Remarks
					Main	Supporting	
	B0/2	Integration with ATM Network function	1	2014	ASPIG	CNS SG, AIM SG, ATM SG, RANP/ NANP TF	
Technology Threads							
ASUR							
ASUR	**B0/1**	Automatic Dependent Surveillance – Broadcast (ADS-B)	1	2021	CNS SG	ATM SG, ASPIG, RANP/ NANP TF	
	B0/2	Multilateration cooperative surveillance systems (MLAT)	1	2021	CNS SG	ATM SG, ASPIG, RANP/ NANP TF	
	B0/3	Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)	1	2021	CNS SG	ATM SG, ASPIG, RANP/ NANP TF	
NAVS							
NAVS	**B0/3**	Aircraft Based Augmentation Systems (ABAS)	1	2021	CNS SG	PBN SG, ATM SG, AIM SG, RANP/ NANP TF	
	B0/4	Navigation Minimal Operating Networks (Nav. MON)	1	2021	CNS SG	PBN SG, RANP/ NANP TF	
COMI							
COMI	**B0/7**	AMHS	1	2014	CNS SG	RANP/ NANP TF	
	B1/1	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS)	1	2021	CNS SG	RANP/ NANP TF	

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 2023 addresses the implementation status of the priority 1 ASBU Threads/Elements for the reference period January 2023 to December 2023.

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

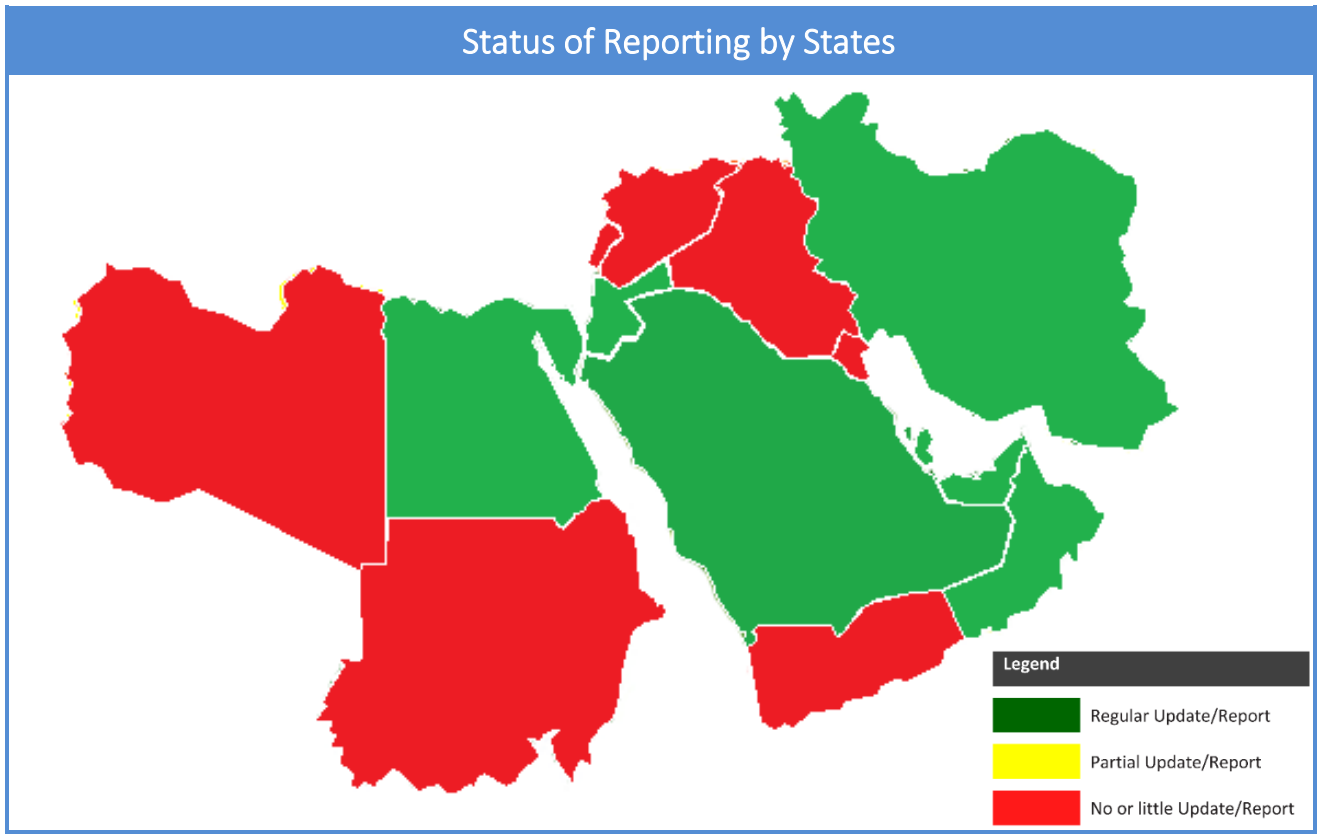
Figure 3. ICAO MID Region

1.4 Collection of Data

For the purpose of collecting necessary data for the MID Air Navigation Report-2023, a State Letter Ref.: AN 1/7 – 23/270 was issued on 6 December 2023, to follow-up on the MIDANPIRG Conclusions 20/9 & 20/11, which urged States to provide relevant data necessary for the development of the MID Region Air Navigation Report-2023. 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 ANP Volume III.

Where the required data was not provided, it is indicated in the Report by color coding (Missing Data) and the last update provided by the concerned States was considered.



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.

- Success stories/best practices
Iraq, Kuwait and UAE

- 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:

Legend	
	Completed
	Partially Completed (50%+)
	Partially Completed/Late (50%-)
	Not Started/Not Implemented
	Not Applicable
	Missing Data

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 B1-DAIM

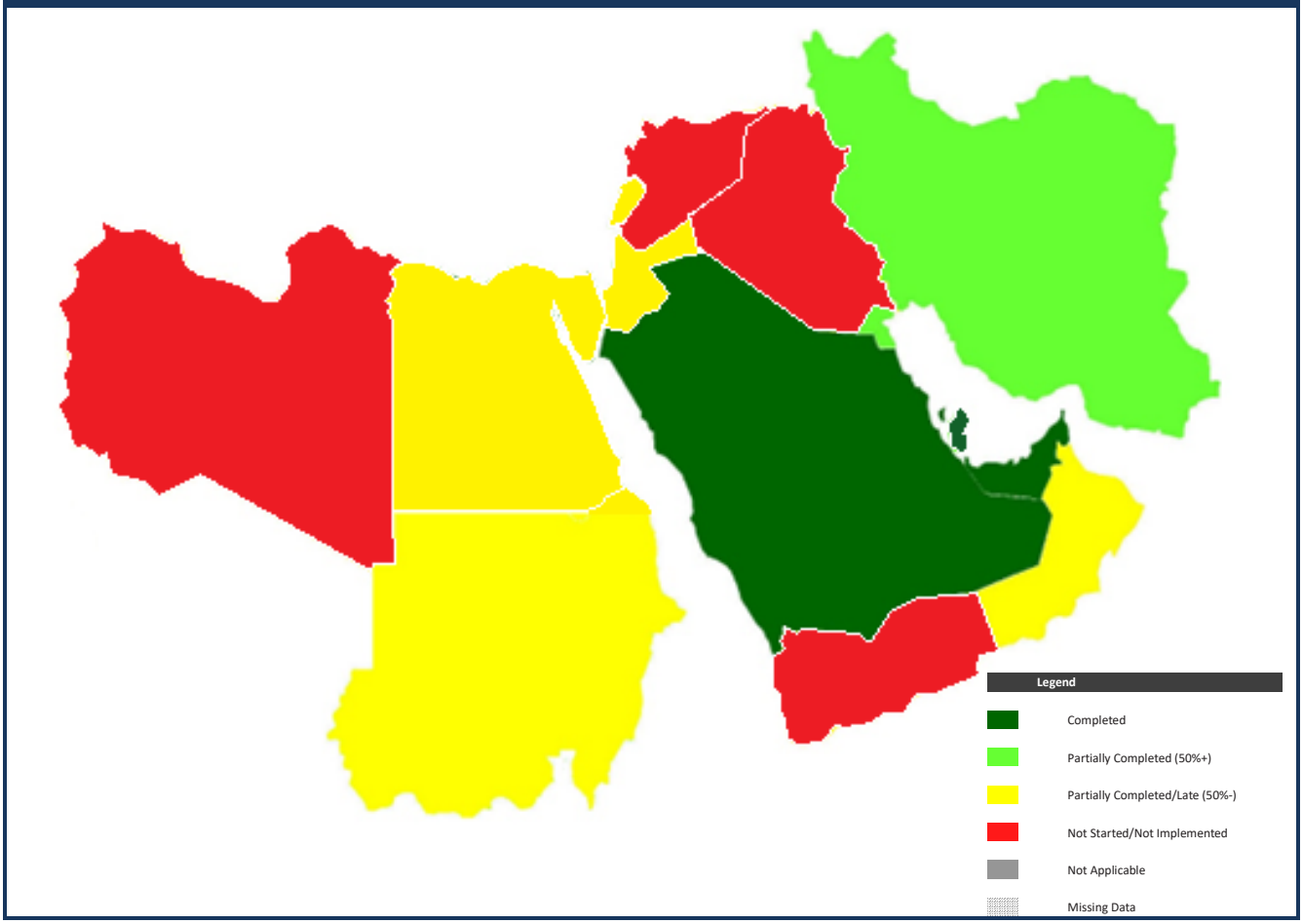
Improved aeronautical information based on enhanced data quality (accuracy, resolution, integrity, timeliness, traceability, completeness, format) to support Performance-Based Navigation (PBN), airborne computer-based navigation systems and ground automation. In addition, digital exchange and processing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

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Information Threads							
DAIM							
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 an AIXM-based AIS database (AIXM V5.1+) 2. Number of States that have established formal arrangements with at least 50% of their AIS data originators.	(2023) 53%	80%	Dec 2024	N/A
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	(2022) 35%	60%	Dec 2024	N/A
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.	(2022) 35%	60 %	Dec 2024	N/A

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 **46.73%**.

DAIM Status of implementation in the MID Region



2.1.2 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.

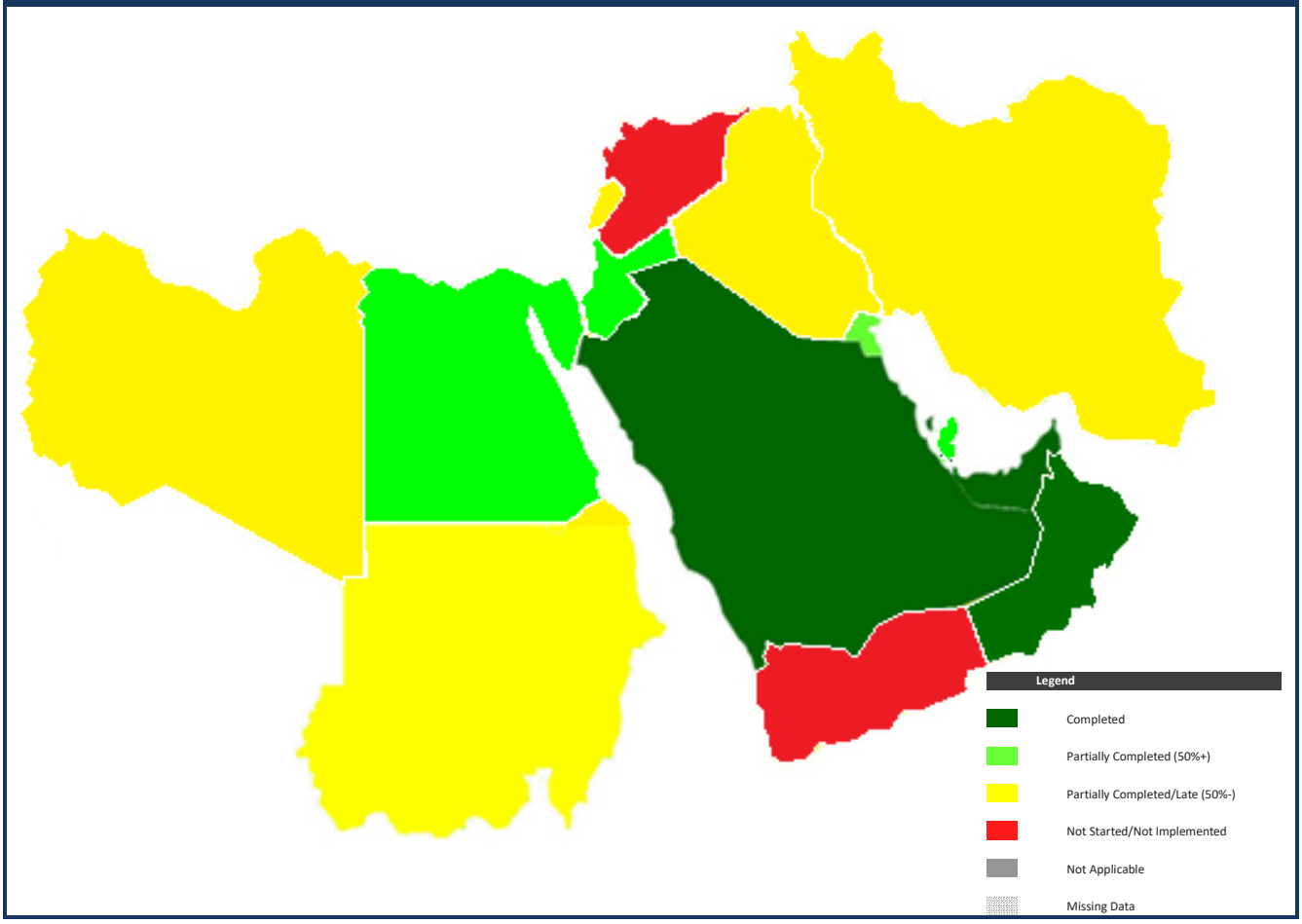
Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Information Threads							
AMET							
AMET B0/1	Meteorological observations products	All states	***Indicator*:*** Regional average implementation status of B0/1 (Meteorological observations products). ***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 9. Wind shear alerts	(2022) 65%	80%	Dec 2021	N/A
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:	(2022) 60%	90%	Dec 2021	N/A

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
			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				
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.	(2022) 60%	85%	Dec 2021	N/A
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)	(2022) 60%	85%	Dec 2021	N/A

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 **56.92%**.

AMET Status of implementation in the MID Region



2.1.3 B0-FICE

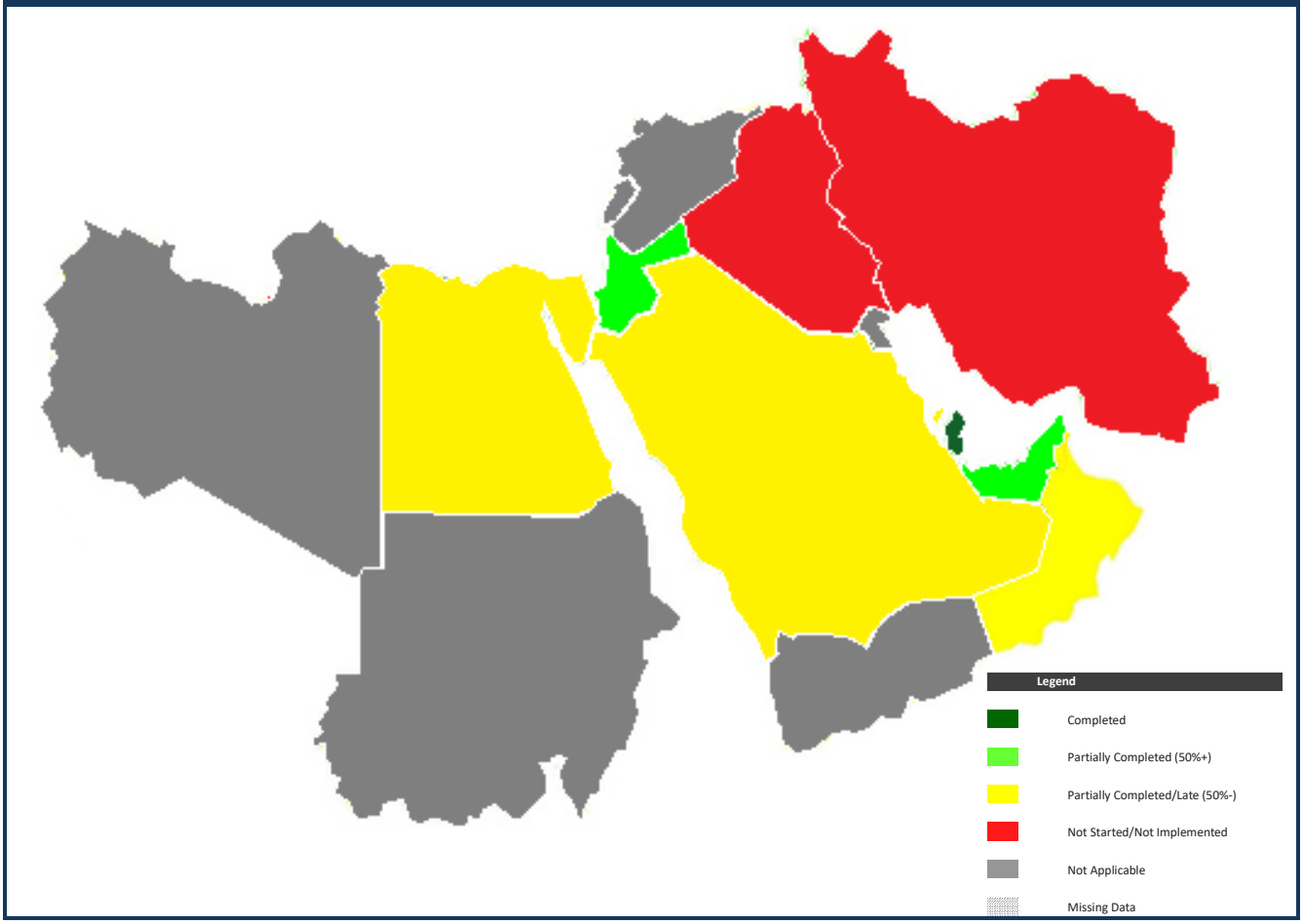
To improve coordination between air traffic service units (ATSUs) by using ATS interfacility flight data communication. The benefit is the improved efficiency through digital transfer of flight data.

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Information Threads							
FICE							
FICE B0/1	Automated basic inter facility data exchange (AIDC)	According to the MID Region AIDC/OLDI Priority 1 Applicability Area	***Indicator*:*** % of priority 1 AIDC/OLDI Interconnection have been implemented. ***Supporting metric:*** Number of AIDC/OLDI interconnections implemented between adjacent ACCs.	(2023) 26%	70%	Dec 2026	N/A

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 **39.39%**.

FICE Status of implementation in the MID Region



2.1.4 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.

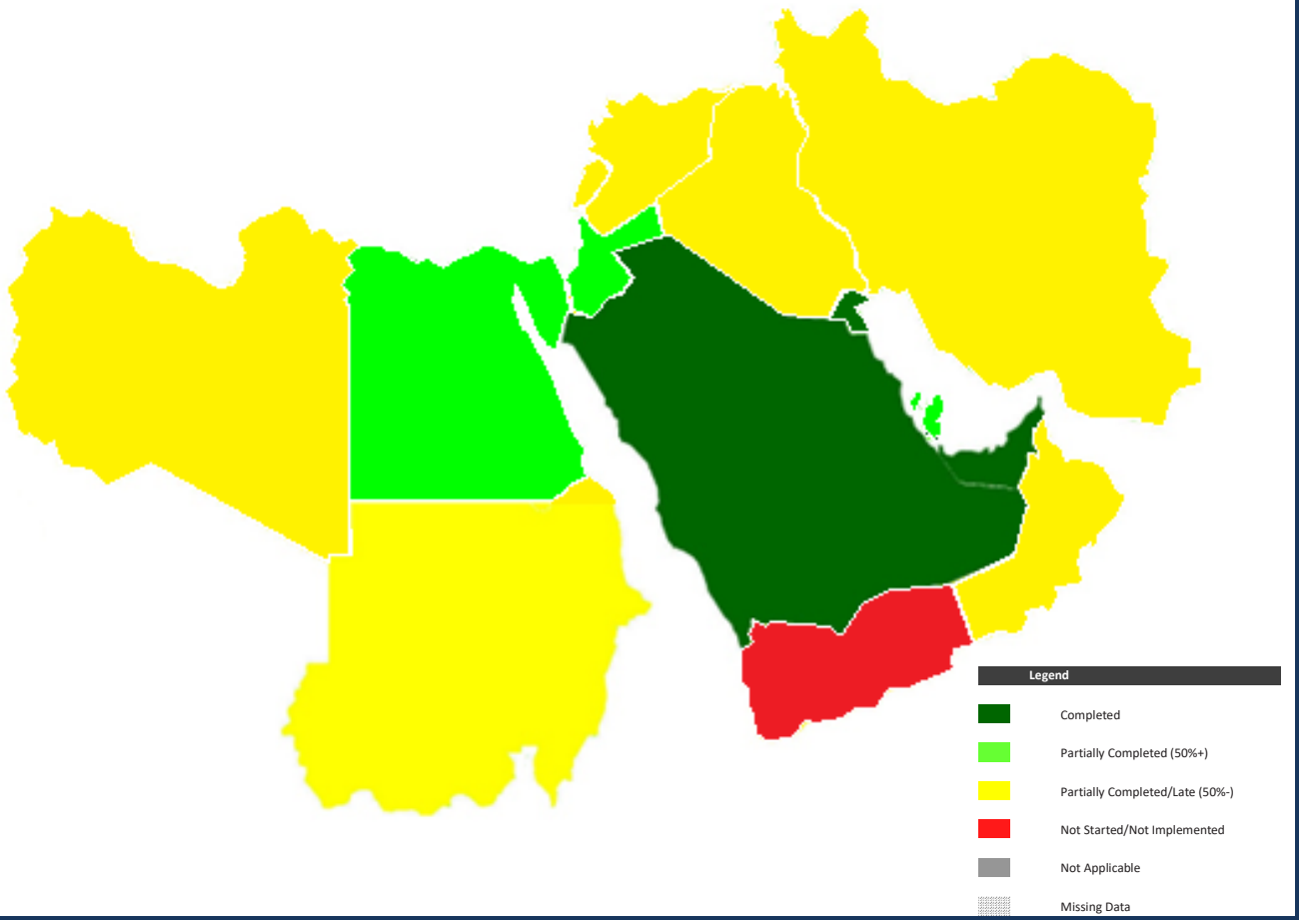
Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
APTA							
APTA B0/1	PBN Approaches (with basic capabilities)	All RWYs ENDs at International Aerodromes	***Indicator:*** % of Runway ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) ***Supporting metric:*** Number of Runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	(2017) 46.7%	100%	Dec 2018	Capacity/ KPI 10
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).	(2022) 55%	70%	Dec 2022	Efficiency Capacity/ KPI 10 KPI 11 KPI 17 KPI 19/
APTA B0/4	CDO (Basic)	OBBI, OIIE, OIKB, OIFM, OJAI, OLBA, OOMS, OTHH,	***Indicator*:*** % of International Aerodromes with CDO implemented as required. ***Supporting Metric:***	(2022) 65%	100%	Dec 2022	Efficiency/ KPI 19

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
		OTBD, OEJN, OEMA,OEDF, OERK, HSSK, HSPN, OMAA, OMAL, OMAD, OMDW, OMDB, OMSJ, OMRK and OMFJ	Number of International Aerodromes with CDO implemented as required. *As per the applicability area				
APTA B0/5	CCO (Basic)	OBBI, OIIE, OIKB, OIFM, OJAI, OLBA, OOMS, OTHH, OTBD, OEJN, OEMA, OEDF, OERK, HSSK, 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	(2022) 65%	100%	Dec 2022	Efficiency/ KPI 17
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.	(2022) 50%	80%	Dec 2025	Capacity/ KPI 10

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 **64.83%**.

APTA Status of implementation in the MID Region



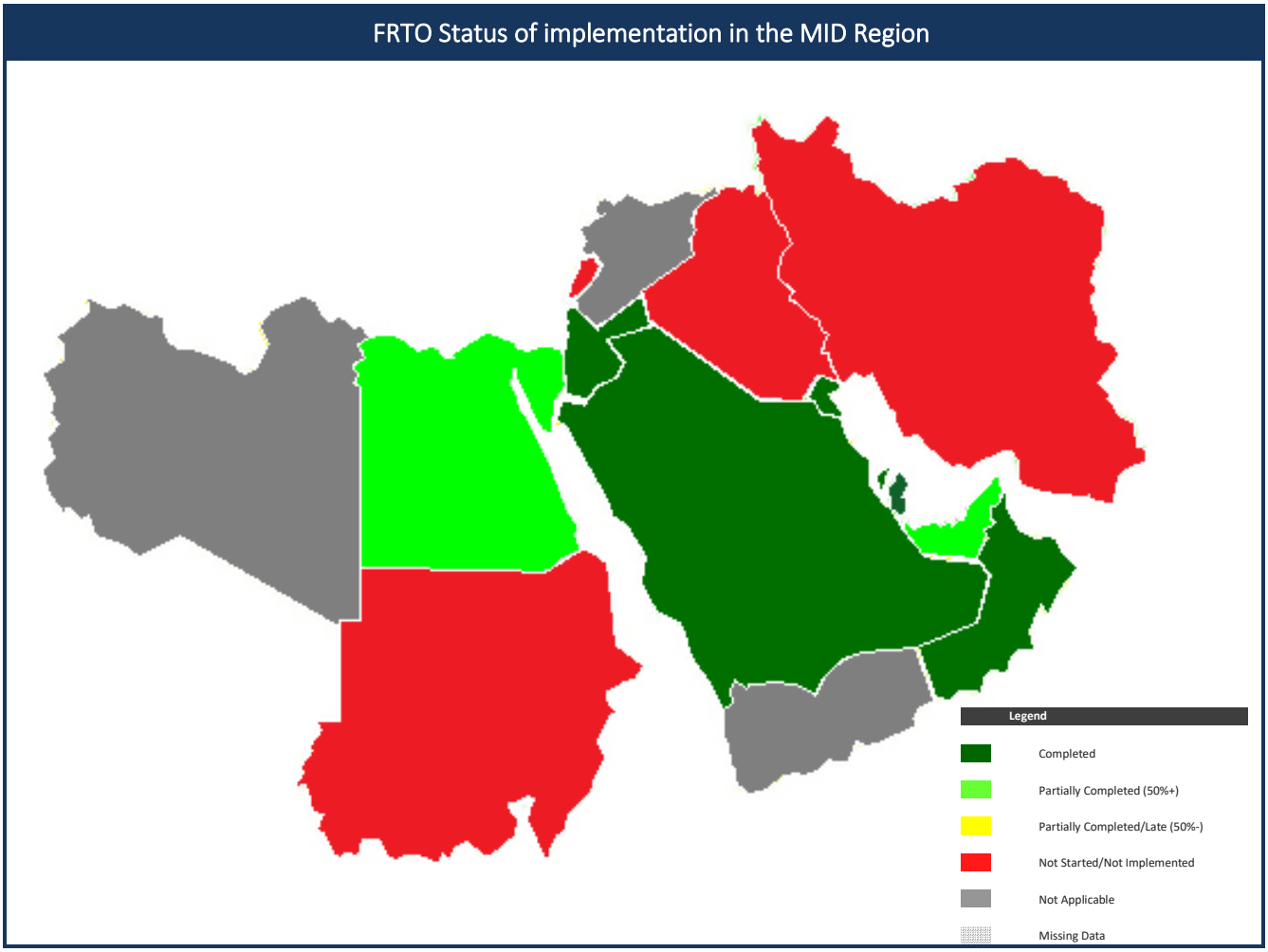
2.1.5 B0-FRTO

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.

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
FRTO							
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	(2022) 63%	70%	Dec 2022	Efficiency Access and equity/ KPI 04 KPI 05 KPI 17 KPI 18/ KPI 19
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	(2022) 63%	100%	Dec 2022	Capacity/ KPI 06 Safety/ KPI 20 KPI 23

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

Average Regional Implementation is **64.88%**.



2.1.6 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:

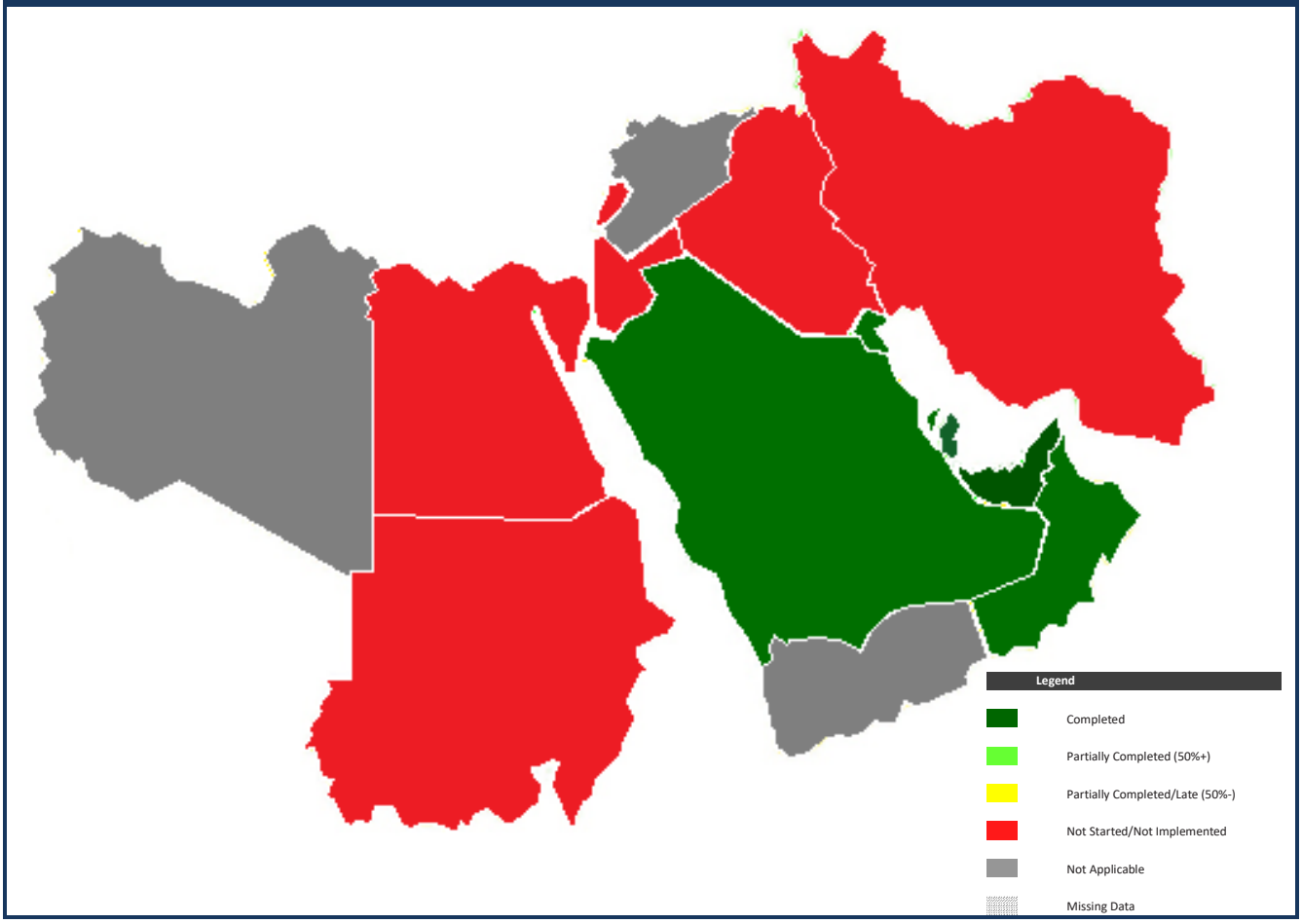
- smoothing flows and managing rates of sector entry;
- re-route traffic to avoid flow constraint areas;
- level capping;
- collaborative airspace management;
- ATFM slot management including departure information planning;
- adjust flow measures by use of enhanced collaborative flight planning and enhanced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

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
NOPS							
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	(2022) 42%	70%	Dec 2022	Efficiency Capacity/ KPI 04 KPI 05 KPI 17 KPI 18 KPI 19/

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

Average Regional Implementation is **41.67%**

NOPS Status of implementation in the MID Region



2.1.7 B1-ACAS

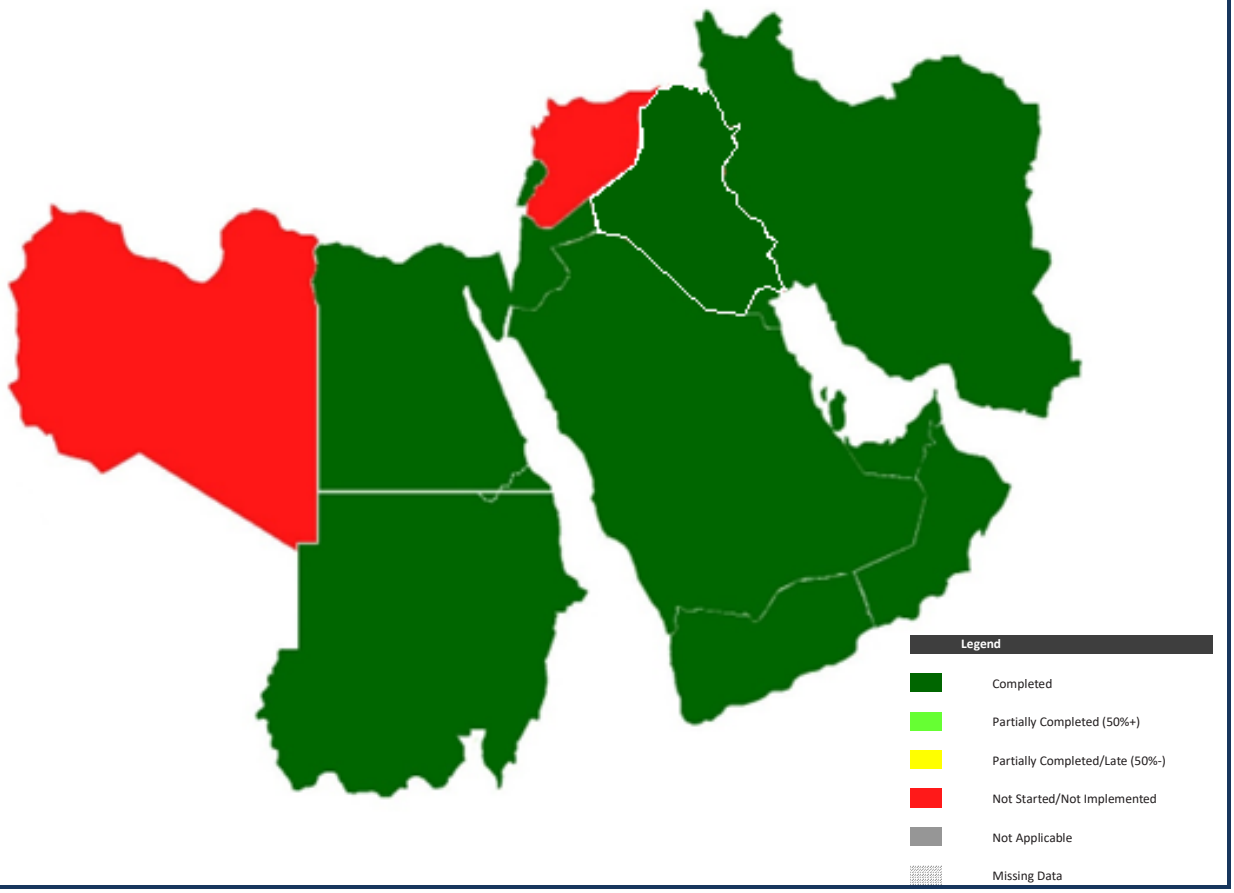
The traffic alert and collision avoidance system (TCAS) version 7.1 provides short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts as well as enhancing the logic for some geometries (i.e., Uberlinghen accident). This will reduce trajectory deviations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

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
ACAS							
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	(2022) 87%	100%	Dec 2024	Safety/ KPI 20 KPI 23

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 **86.67%.**

ACAS Status of implementation in the MID Region



2.1.8 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.

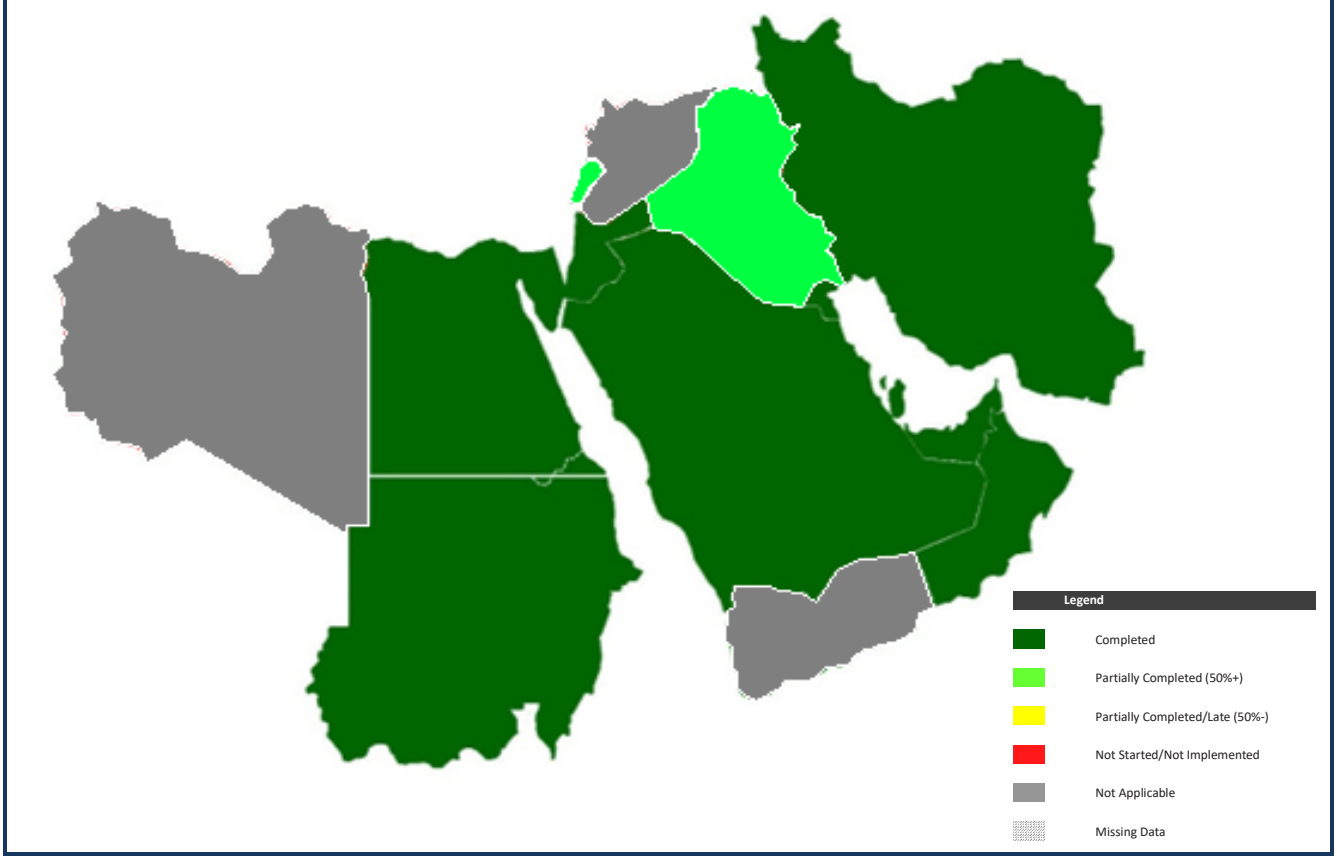
Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
SNET							
SNET B0/1	Short Term Conflict Alert (STCA)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE	***Indicator*:*** % of States 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	(2018) 100%	100%	Dec 2018	Safety/ KPI 20 KPI 23
SNET B0/2	Minimum Safe Altitude Warning (MSAW)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, 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	(2018) 100%	100%	Dec 2018	Safety/ KPI 20
SNET B0/3	Area Proximity Warning (APW)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, 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	(2022) 67%	100%	Dec 2022	Safety/ KPI 20

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
			Proximity Warning (APW) for ACCs, as required. * As per the applicability area				

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 **91.67%**.

SNET Status of implementation in the MID Region



2.1.9 B1-GADS

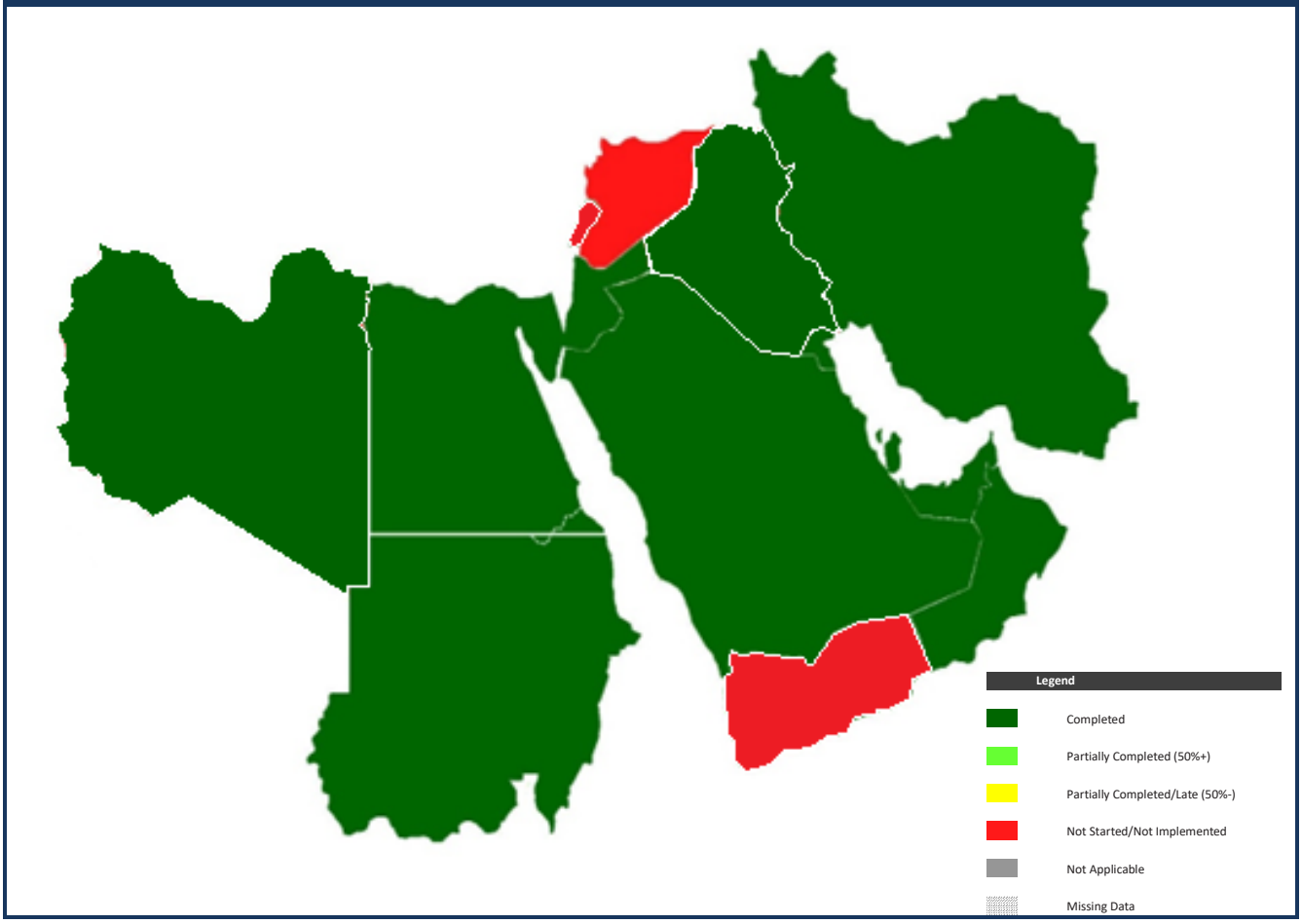
In oceanic areas without automatic surveillance, ATSU Alerting Service is supported with aircraft tracking capability implemented by the aircraft operator. Point of Contact (PoC) information is provided to facilitate establishing contact between relevant Stakeholders in emergency situations.

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
GADS							
GADS B1/2	Operational Control Directory	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.	(2022) 73%	100%	Dec 2022	N/A

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 **80%**.

GADS Status of implementation in the MID Region



2.1.10 B0-RSEQ

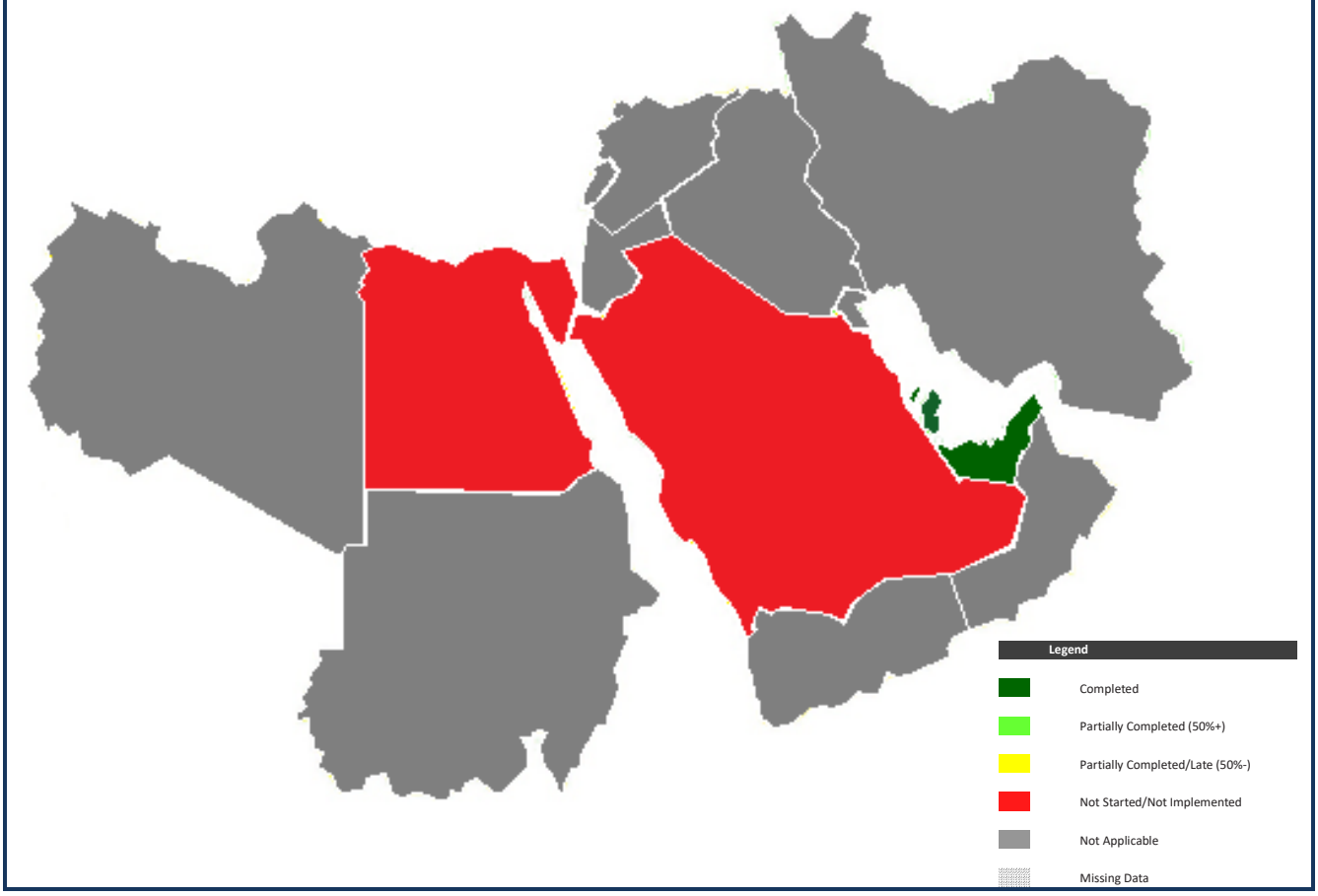
Arriving flights are "metered" and sequenced by arrival ATC based on inbound traffic predication information, optimizing runway utilization. Also departures are sequenced allowing improved start/push-back clearances, reducing the taxi time and ground holding, delivering more efficient departure sequences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

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
RSEQ							
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	(2022) 36%	80%	Dec 2024	Capacity Efficiency/ KPI 08 KPI 10 KPI 11 KPI 14/

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 **35.71%**.

RSEQ Status of implementation in the MID Region



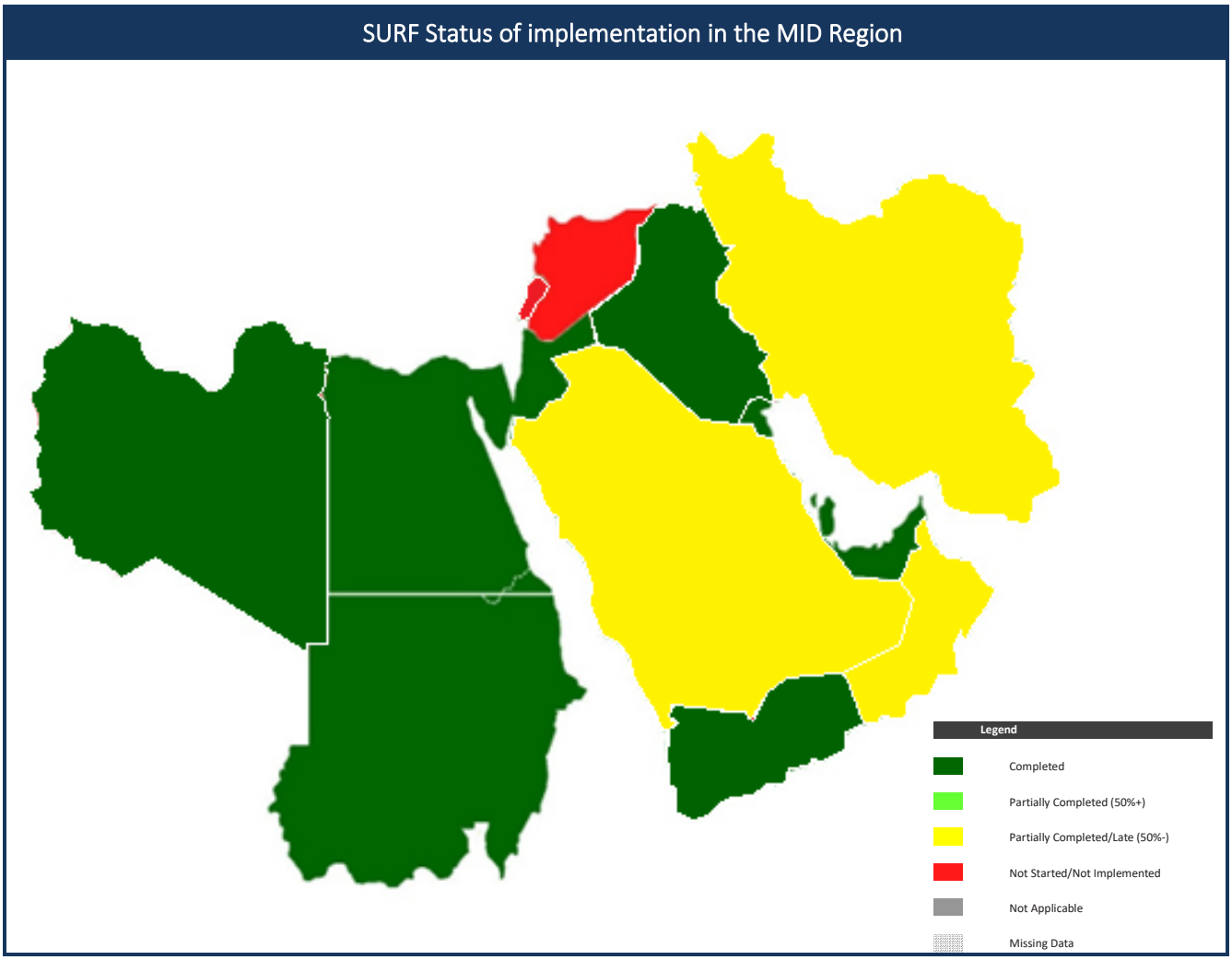
2.1.11 B0-SURF

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.

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
SURF							
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	(2022) 90%	100%	Dec 2022	Efficiency/ KPI 02 KPI 13 Safety/ KPI 20 KPI 21
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	(2022) 61%	80%	Dec 2022	Safety/ KPI 20 KPI 21
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	(2022) 74%	80%	Dec 2022	Safety/ KPI 20

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 **66.67%**.



2.1.12 B0 & 1-ACDM

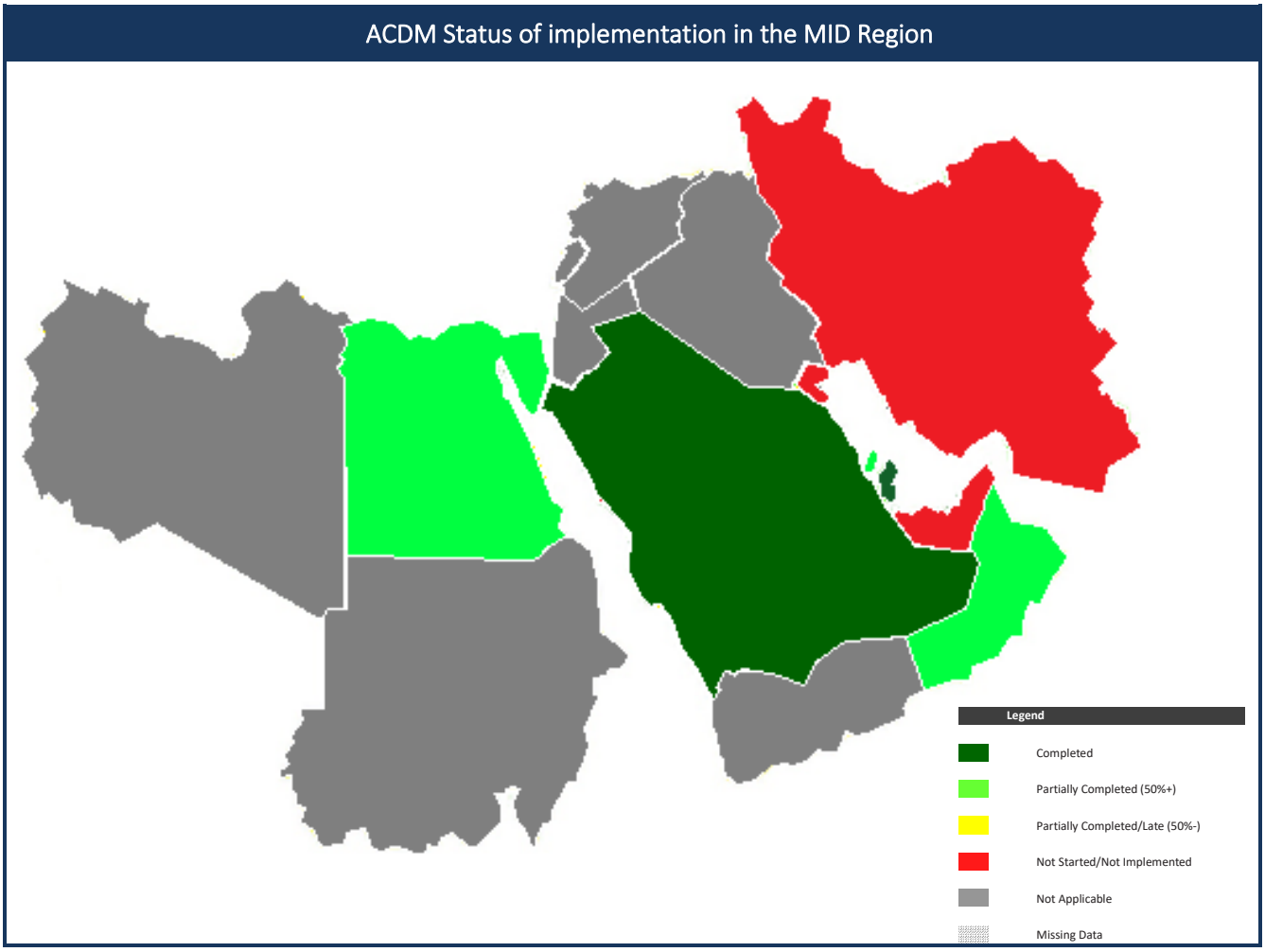
B0: Aerodrome operators, aircraft operators, air traffic controllers, ground handling agents, pilots and air traffic flow managers share live information that may be dynamic, in order to make better and coordinated decisions. This applies notably in day to day operations and also in case of severe weather 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).

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
ACDM							
ACDM B0/1	Airport CDM Information Sharing (ACIS)	HECA, OBBI, OIII, OKKK, 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	(2022) 75%	90%	Dec 2024	N/A
ACDM B0/2	Integration with ATM Network function	HECA, OBBI, OIII, OKKK, 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	(2022) 25%	50%	Dec 2024	N/A

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

Average Regional Implementation is **45%**.



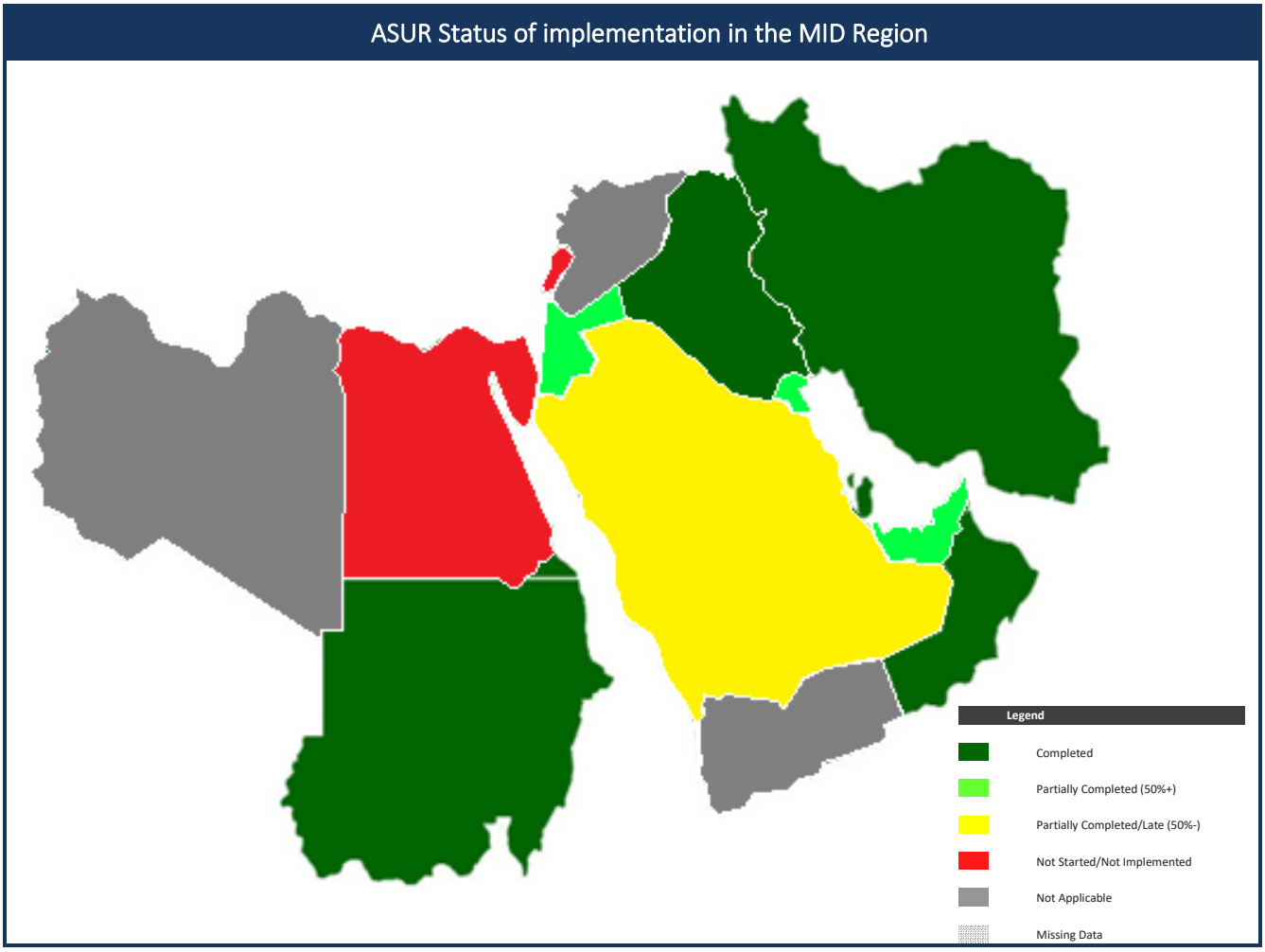
2.1.13 B0-ASUR

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.

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Technology Threads							
ASUR							
ASUR B0/1	Automatic Dependent Surveillance – Broadcast (ADS-B)	Bahrain, , Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, , 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	(2022) 60%	80%	Dec 2022	N/A
ASUR B0/2	Multilateration cooperative surveillance systems (MLAT)	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, 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	(2022) 63%	80%	Dec 2022	N/A
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	(2022) 83%	90%	Dec 2023	N/A

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 **65.28%**.



2.1.14 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.

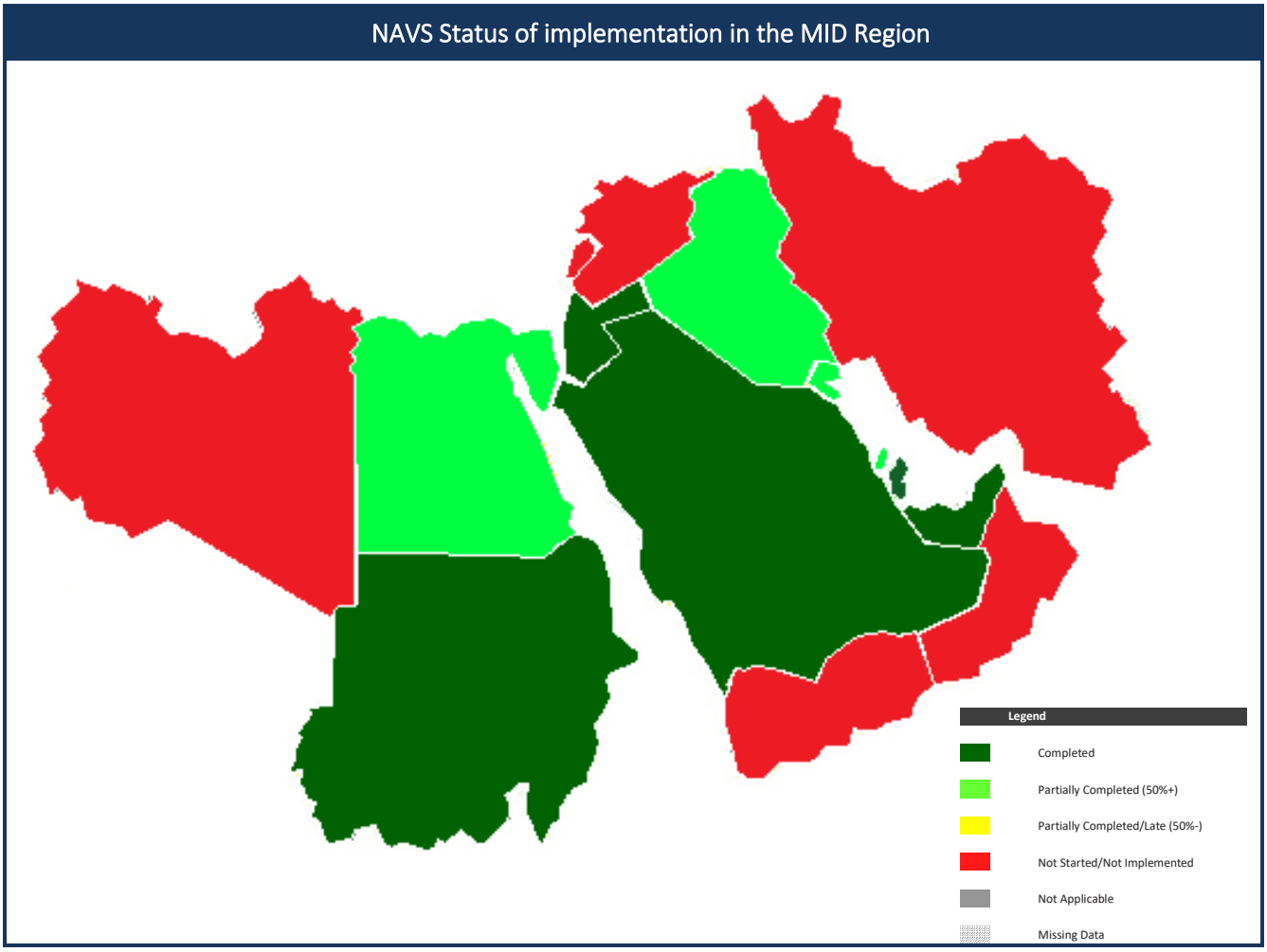
SBAS and ABAS are implemented as a mean to comply with ICAO Assembly Resolution A37-11 regarding Vertically-Guided Approach. SBAS is provided to support PBN in all phases of flight with increased accuracy and integrity. ABAS is provided to support non-precision (LNAV) and vertically-guided approach with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

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Technology Threads							
NAVS							
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	(2022) 40%	70%	Dec 2022	N/A
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.	(2022) 47%	70%	Dec 2022	N/A

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 **46.67%**.



2.1.15 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:

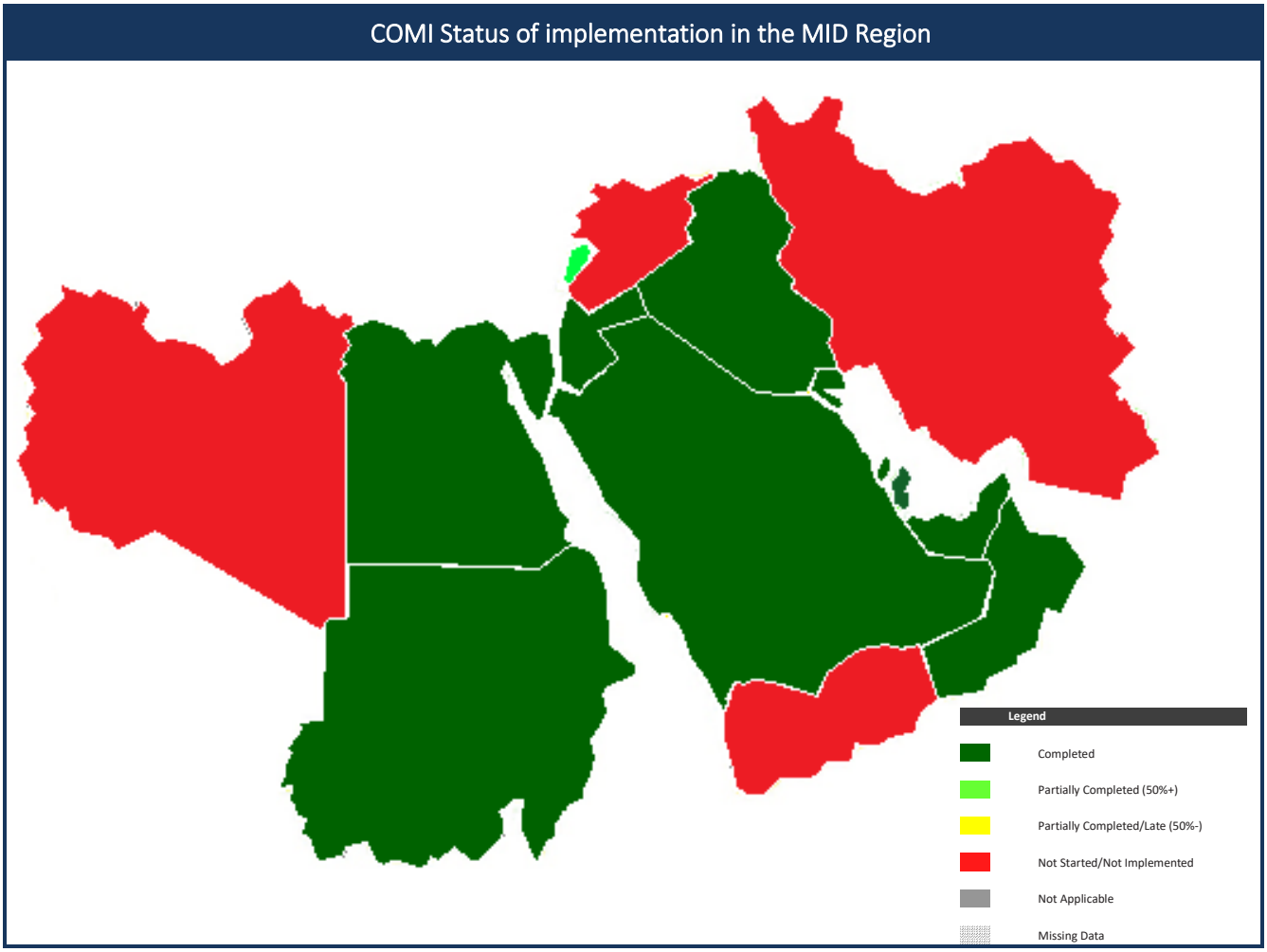
- AMHS with extension service to support XML, FTBP (IWXMM).
- Expansion of AIDC to enhance efficiency and safety.
- Implement regional IP networks.
- AeroMACS circuits for airport local communications.

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Technology Threads							
COMI							
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	(2022) 73%	90%	Dec 2022	N/A
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	(2022) 60%	80%	Dec 2022	N/A

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
			Supporting metric: Number of States that have established National IP Network for voice and data communication				

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 **70%**.



3. SUCCESS STORIES/BEST PRACTICES

Iraq

3.1 Establishment of Air Traffic Flow Management (ATFM) unit

3.1.1 The AFTM unit in GCAAN - Iraq has seen remarkable success and growth since its inception in 2018, paving the way for efficient air traffic flow management in the region.

Capacity Calculation and Analysis:
The unit implemented a robust system to calculate sector capacity and introduced half-yearly analyses to gauge the effectiveness of their strategies. Data collection from controllers, categorized by their level of experience, enabled a comprehensive understanding of operational dynamics.

Continuous Learning Initiatives:
Recognizing the importance of staying updated, the unit encouraged self-study among team members and integrated GCANS local training for ATFM members, following the guidelines from document 014 version 2.

National ATFM Plan Implementation:
A strategic milestone was achieved with the formulation and execution of a comprehensive National ATFM plan, aligning operations with international standards and best practices.

Collaborative Decision Making (CDM):
The unit initiated CDM practices, fostering collaboration with stakeholders through the daily sharing of ATFM plans and regular teleconferences. This ensured transparency and alignment of goals among all involved parties.

Traffic Prediction Technology:
Leveraging locally developed software using Python, the unit achieved accurate predictions of overflight traffic on an hourly basis, enhancing operational efficiency and resource allocation.

Airport Traffic Forecasting:
By integrating software predictions with local approval lists, the unit successfully forecasted airport traffic, allowing for proactive management and optimization of resources.

ACDM Implementation Plan:
While not yet initiated, the unit laid down a comprehensive plan for the introduction of Airport Collaborative Decision Making (ACDM), further streamlining airport operations, and enhancing overall efficiency.

Slot Coordination during Religious Events:
Recognizing the unique challenges posed by religious events, particularly in regions like ORNI, the AFTM unit implemented slot coordination strategies. By effectively managing air traffic flow during these high-demand periods, the unit ensured seamless operations, mitigated congestion, and maintained safety standards, further enhancing the overall efficiency and reliability of air travel in the region.

3.1.2 Through concerted efforts and meticulous planning, the AFTM unit witnessed a remarkable transformation, reflected in the significant improvement from a zero score to 68.4 in the latest ICAO MID-office survey. This success story stands as a testament to the dedication and proficiency of the team, showcasing Iraq's commitment to excellence in air traffic management.

Kuwait

3.2 Development of Kuwait National Air Navigation Plan (KNANP)

3.2.1 Kuwait has achieved great success in implementing its aviation air navigation plan in cooperation with the ICAO MID Office. By following the guidelines and standards set by the International Civil Aviation Organization, Kuwait has been able to enhance the safety and efficiency of its air navigation services. Through collaboration and partnership with the ICAO MID Office, Kuwait has made significant advancements in modernizing its aviation infrastructure and ensuring compliance with international regulations. This successful collaboration has not only improved the overall aviation system in Kuwait but also strengthened its reputation as a responsible member of the global aviation community.

3.3 Tower 3D Simulator

3.3.1 Kuwait DGCA launched its first 360 3D Tower simulator since it established. The Simulator was designed and delivered by Indra. The project was delivered to DGCA in Q4 2023 and since then it has been running perfectly. AND rely on the Simulator to do the annual ATCOs competence check (rating and endorsement). Further to the competency check, AND using the simulator to train the new ATCOs and provide them pre OJT sessions. Having such a Simulator reduced the coast and the time spent in training and maintaining the level of competence required.

3.4 Implementation of Free Route Airspace (FRA)

3.4.1 During July 2023, the UAE General Civil Aviation Authority launched the Free Route Airspace Project in the Emirates FIR, in a step that enhances the position of the UAE's air navigation sector in the region. This transformative project aims to enhance air navigation efficiency, utilizes resources optimally, and harnesses modern concepts in air traffic management. The project will have a positive impact on both the air sector and the environment.

3.4.2 The Implementation of free route airspace, which the UAE is the first country to apply in the Middle East, aims to improve the efficiency of air navigation by providing freedom of movement for over-flying aircraft without the restrictions of conventional air routes.

3.4.3 This transformational project will provide the Emirates FIR with high flexibility, which encourages air operators to use it more, as it will reduce airspace congestion, contribute to shortening flight times and increasing the efficiency of flights. It will also lead to achieving significant environmental benefits, by reducing flown miles and shortening flight paths. Aircraft will consume less fuel and reduce carbon emissions and environmental pollution, which will reflect positively on environmental sustainability.

3.4.4 The launch of this transformative project coincided with UAE's declaration of 2023 as the year of sustainability, as it reinforces the goal of the UAE General Civil Aviation Authority represented in its commitment to national priorities and the new government work methodology for the UAE, in line with the broader concept of transformational projects, which aims to advance the path of development in the country for the next ten years, forthcoming and beyond.

3.4.5 The implementation of Free Route Airspace is expected to enable more than 55,000 annual flights to benefit from its use, and will lead to an annual fuel saving of more than 30 million kg, and operational savings. Annual benefits for airlines exceeding 50 million Dirhams, in addition to indirect operating benefits.

3.4.6 The number of flights benefiting from the project will increase continuously, according to the GCAA's expectations for an increase in air traffic in the coming years, in addition to the development of the stages of applying free route airspace to include a segment of new users that exceeds the current application, and it will constitute a factor of attraction for all airlines.

3.4.7 These positive expectations come to enhance the benefits of this pioneering project in the economic aspect for airlines, as companies will benefit from reducing fuel costs and improving flight efficiency, and thus will lead to improving the financial performance of airlines, enhancing their economy, and enhancing happiness and quality of life.

3.4.8 The air navigation sector in the UAE was on the rise in 2023, where the UAE has scored the highest daily movements ever in the history of aviation with 2848 air traffic movements during November 2023. That the UAE is one of the first countries to recover to pre-pandemic levels traffic levels, pointing to an air traffic growth to that exceeded 931,000 air movements by the end of 2023, an increase of more than 17% from pre-pandemic levels.

3.4.9 Free Route Airspace implementation is a pioneering leap which is a first step in an integrated plan to apply free route airspace on a larger scale, according to carefully studied stages with the aim of improving the airspace infrastructure.

3.4.10 The maximum benefit from this concept is achieved when this transformative project is implemented on a larger scale at the level of neighboring countries to connect with the Gulf and regional air navigation networks, which comes as testament of the airspace restructuring project that the GCAA completed in 2017 with the aim of continuing to improve the airspace, ensuring smooth air traffic and to handle the expected traffic growth until 2040.

3.4.11 The application of UAE GCAA free route airspace, is an exceptional achievement that enhances the efficiency of air navigation, supports the economy of airlines, and contributes positively to enhancing sustainability in aviation.

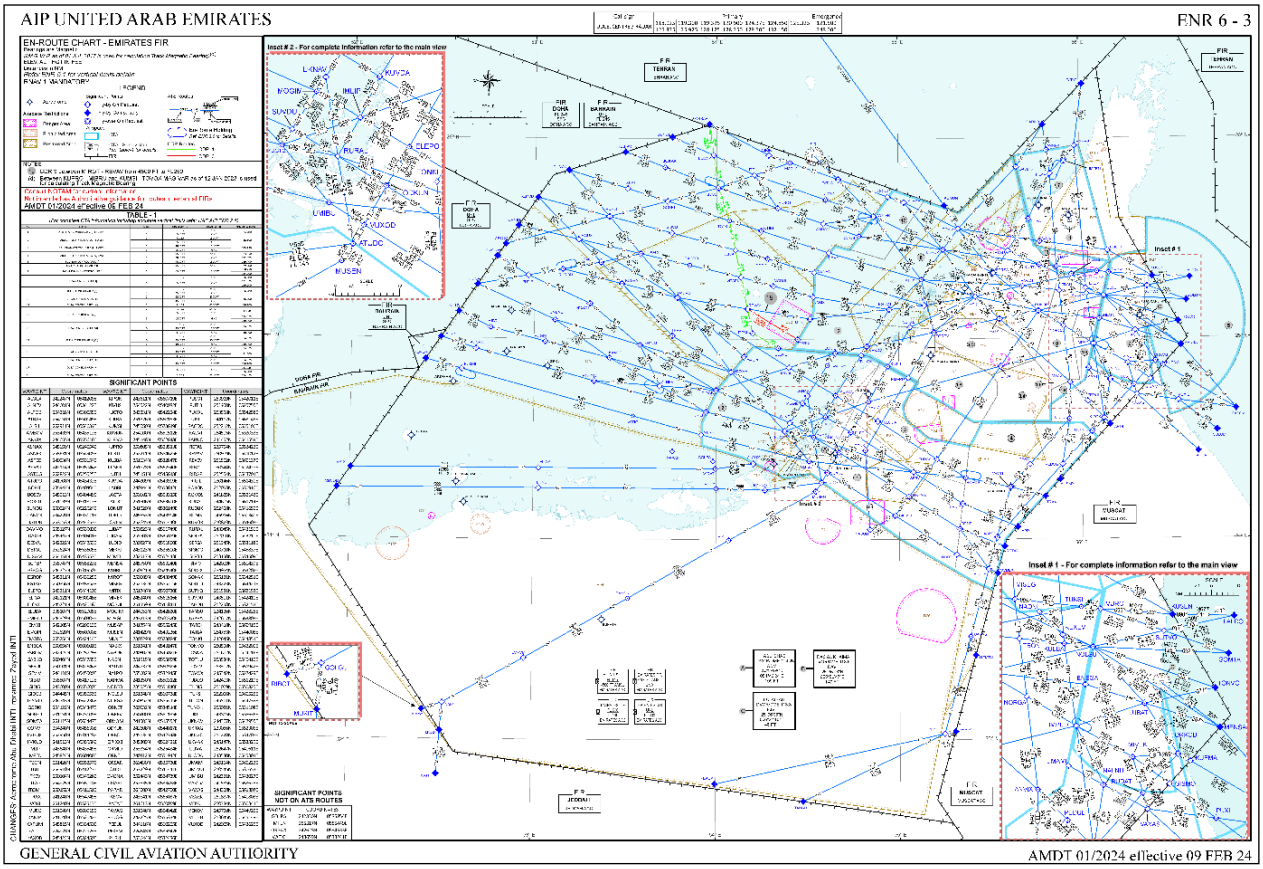
3.5 Data-driven charts migration progress

3.5.1 UAE GCAA AIM Department created intermediate and long-term plan for implementation of Database Driven Charting System. The plan is aligned with UAE GCAA Strategic Objectives; UAE Local Regulations and ICAO SARP's, Global

Air Navigation Plan (ICAO 9750), Roadmap for the Transition from AIS to AIM (ICAO), Global Air Traffic Management Operational Concept (ICAO 9854).

3.5.2 Following the plan UAE GCAA had successfully migrated and published En-route, SID and STAR Charts. Following the successful publication of the mentioned charts, UAE GCAA AIM is in the process of conducting a feasibility of migration and publication of Approach Charts.

3.5.3 In the process of migration and publication UAE GCAA AIM developed standardization document for coding the procedures. Standardization was helpful in harmonizing the coding in UAE for effective and efficient data exchange and chart production.



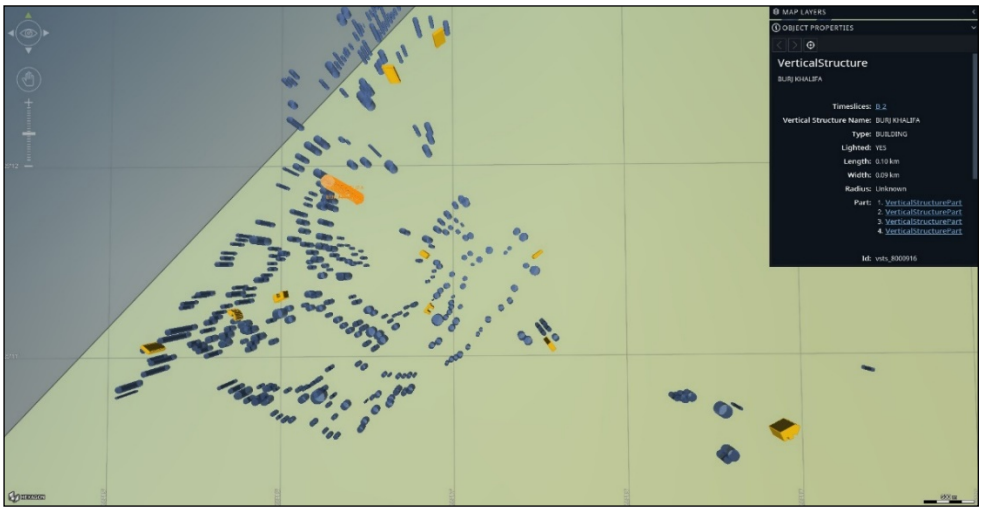
Enroute Chart – AIXM Database Driven

3.6 Providing fully compliant eTOD Data

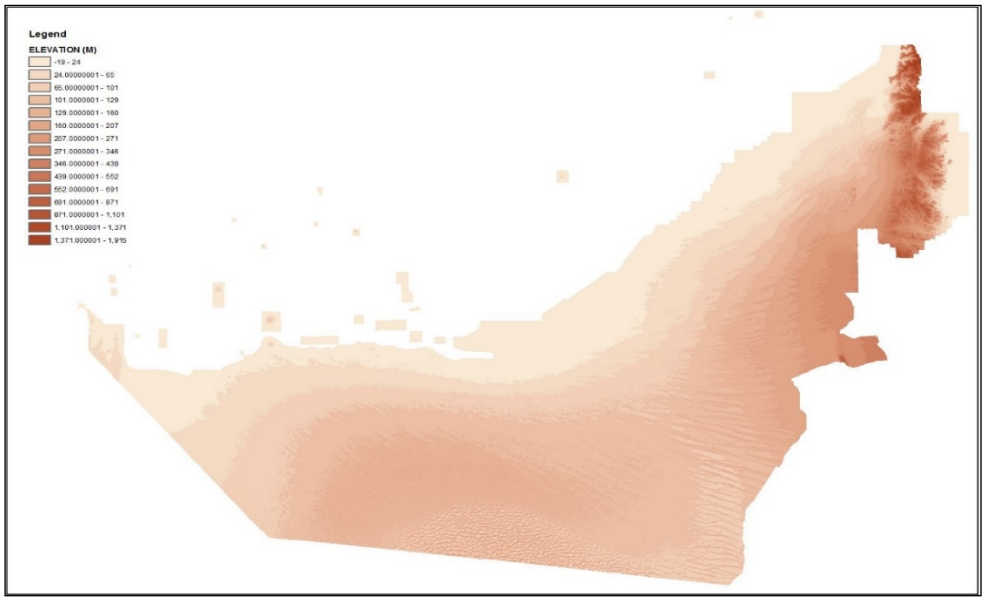
3.6.1 UAE GCAA AIM developed Technical specifications in line with UAE GCAA Strategic Objectives; UAE Local Regulations and ICAO SARP's Annex 15, Doc. 10066 and Doc. 9881.

3.6.2 The developed technical specifications we helpful to potential supplier in understanding the scope, quality and attributes requirements and deliver the data.

3.6.3 UAE GCAA AIM delivered the data in industry standard exchange format i.e. AIXM 5.1. to support system compatibility the data is being delivered in BASELINE and PERMDELTA interpretation with all Mandatory Attributes, Metadata and Data product specifications.



Obstacles



Terrain

3.7 Aeronautical Information Data Integrity

3.7.1 UAE GCAA AIM implemented cryptographic technology hash function for data integrity monitoring and assurance for Aeronautical Information Management Products.

3.7.2 UAE is continuously seeking ways for improvements in order to assure its data integrity level; that no data will be either altered or lost. The hash function is introduced based on the standards of Annex 15 and Doc 10066 for data integrity.

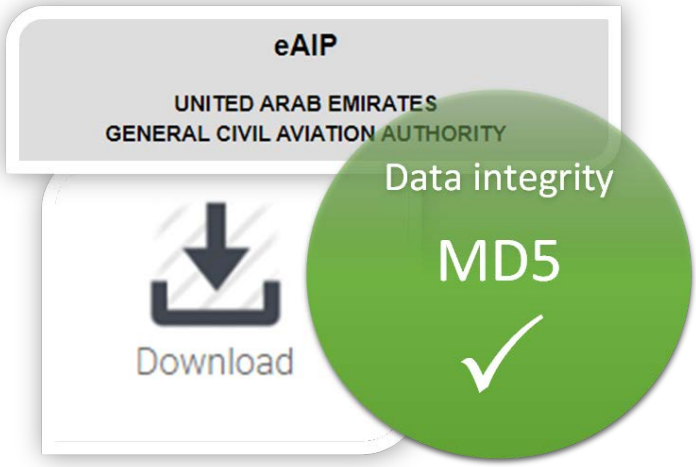
3.7.3 With reference to DOC 10066 PANS – Aeronautical Information Management and Annex 15 – Aeronautical Information Services, the implementation of cryptographic technologies should be utilized to ensure the integrity of data is maintained at all stages of the data chain - from its inception to distribution to the next intended user. The cryptographic technologies could be in the form of for e.g. hash functions, message authentication codes, asymmetric and symmetric encryption, and digital certificates.

3.7.4 To ensure Data integrity assurance UAE researched, identified, and introduced that MD5 (message-digest 5 cryptographic hash algorithm) the hash function, can be used to authenticate files, detection of errors and data manipulation.

3.7.5 Hash functions (MD5 checksum) for the AIP.zip file is provided along with each AIP update notification email, with clear instruction how to generate the hash at the users' end to verify.

3.7.6 Hash functions (MD5 checksum) for each file within the AIP Package is provided in an excel file along with Windows shell command for generating the codes for comparison, of each file in the package. Instructions and guidance material are provided within the package.

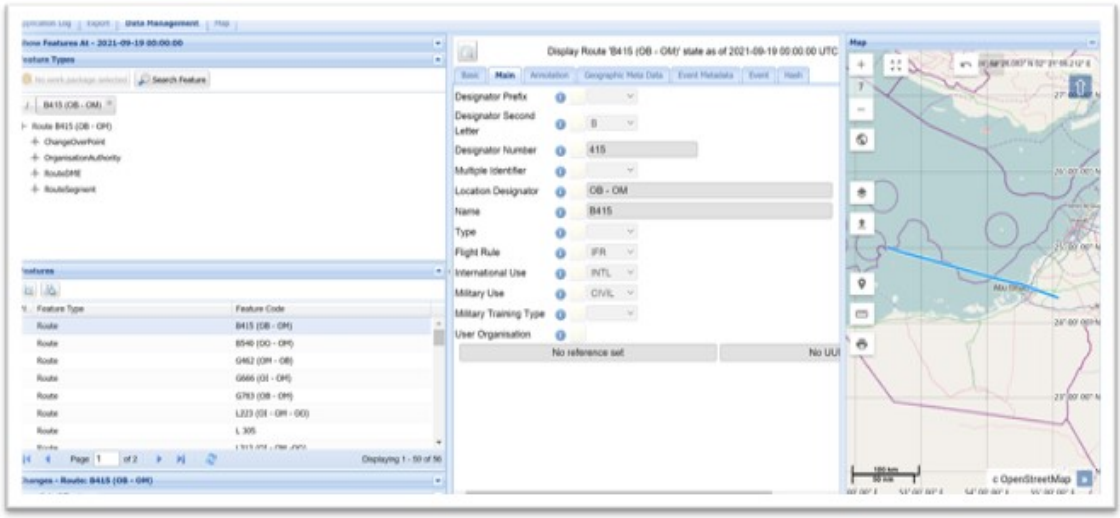
3.7.7 The hash function satisfies the requirement of data integrity for published aeronautical information, furthermore; provides UAE AIP users a high degree of assurance.



3.8 AIM System Wide Information Management (SWIM)

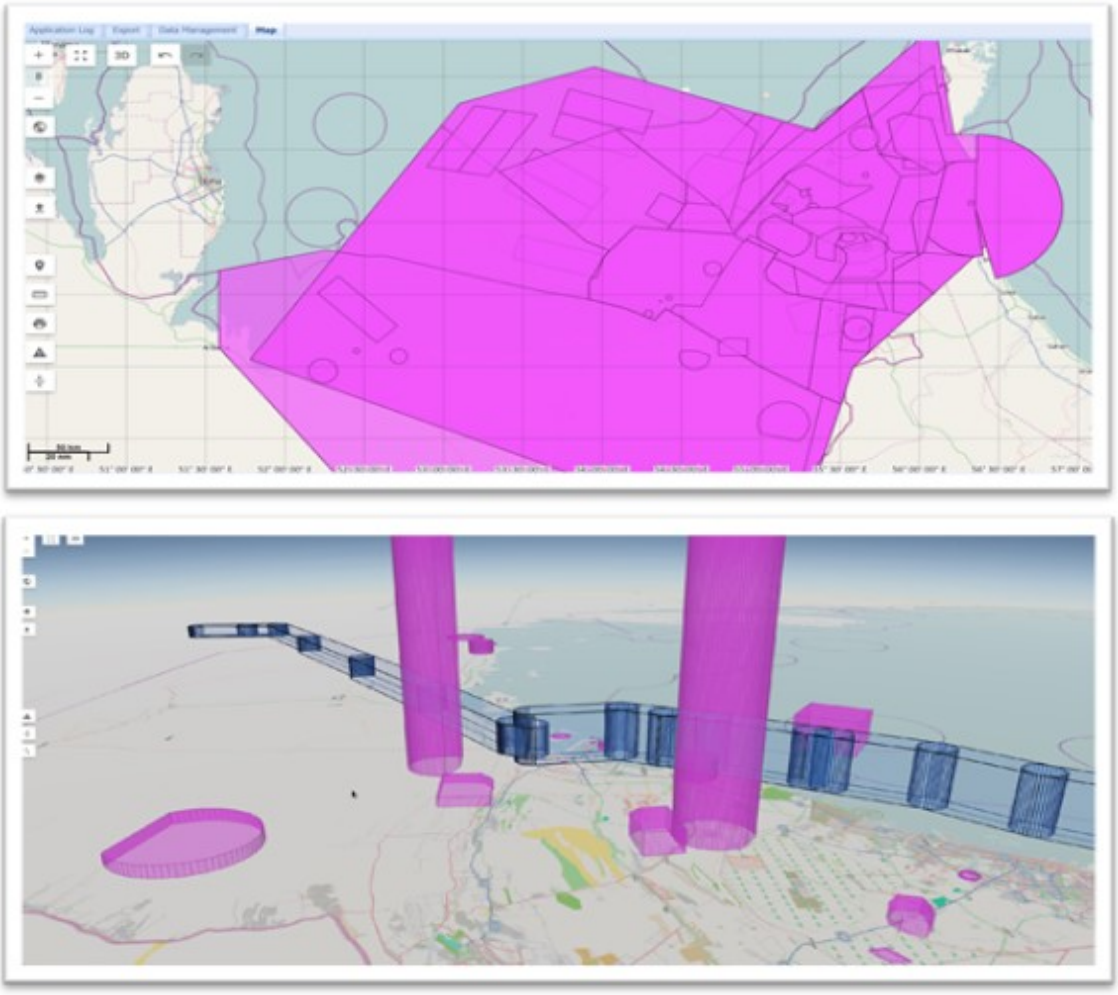
3.8.1 UAE GCAA AIM has implemented System Wide Information Management "AIM – SWIM" which is part of ICAO's Aviation System Block Upgrade (ASBU) and a milestone specified in ICAO MID Region Plan "DOC.008 2.2".

GCAA AIM SWIM Service Login Page

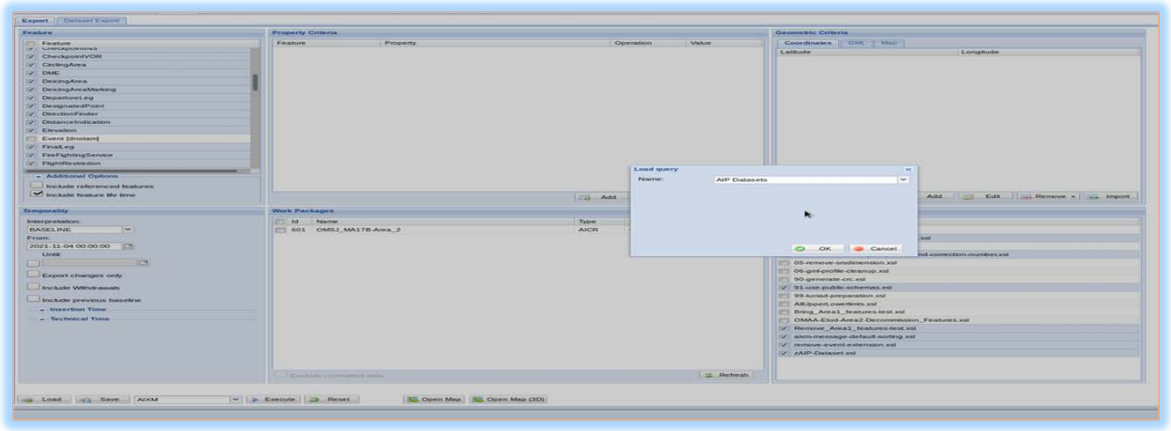


GCAA AIM SWIM Service Human Machine Interface (HMI)

3.8.2 The aim of SWIM is to provide information to users in relevant and commonly understandable format. It does not refer to a single solution or technology, but rather a global level of interoperability and standardization that enables users and providers to exchange data without having to use different interfaces or protocols. It is based on service-oriented architecture and open standard technologies.



GCAA AIM SWIM Enhanced Feature – Graphical Visualization 2D & 3D



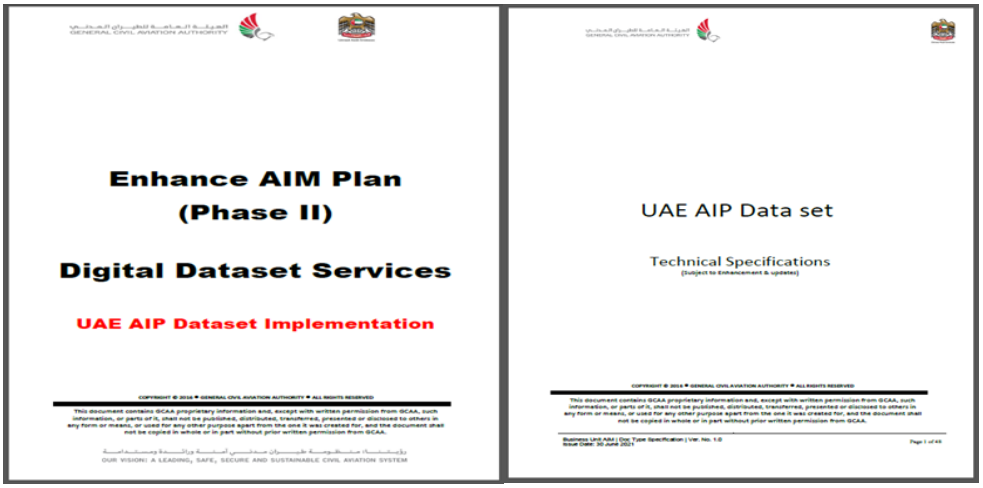
GCAA AIM SWIM Service – AIP & ETOD Dataset

3.9 Provision of UAE AIP Digital Dataset

3.9.1 One of the AIM high-level plan and continuous development process is the provision of UAE AIP Dataset. This forward step within the Aeronautical Information Management Services is to assure meeting the ICAO MID Region Planned Roadmap specified in "MID DOC 008 – 2.2" ahead of time.

3.9.2 The GCAA AIM has studied the requirement, understood the challenges, identified the gaps and drew a roadmap with different milestones to assure the readiness of its AIP Data set i.e. dividing the project into two main phases with different sub-tasks. The first phase was "setting the stage phase" where in this the stage the GCAA AIM has worked on different subject and mitigated different challenges to end up accomplishing a detailed implementation plan, writing the operational and technical specification, mapping AIP to PANS-AIM, creating a test sample file and testing the sample. The Second phase was "The Operational Phase" which was the provision of the AIP Dataset in parallel with the full eAIP at the same time.

3.9.3 UAE AIP Dataset Specification and Implementation Plan & UAE AIP Dataset Technical Specifications



AIP Dataset Sample in AIXM Format

4. CONCLUSION

The overall implementation of priority 1 ASBU Threads/Elements in the MID Region is around **60.14%** compared to 57% in 2022. The implementation of some modules has been acceptable/good (more than 70%); such as ACAS, SNET and GADS. 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, Jordan, Oman, Qatar, Saudi Arabia & UAE made a good progress (more than 70%).

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. States are also strongly encouraged to implement the performance-based approach (6 step approach) and integrate the implementation of the priority 1 ASBU elements in their overall planning for the improvement of their air navigation system performance. States are requested to report to the ICAO MID Office the implementation of the identified performance objectives using the following Template available in the MID ANP Volume III.

MID Region Air Navigation Systems Performance Based Framework/Template

Column

(1) Scope of Performance Improvement
(2) KPA (from the ICAO defined 11 Key Performance Areas (KPAs))
(3) Performance Objectives (ambition/expectations)
(4) KPIs based on the ICAO list of KPIs and associated variant
(5) The Baseline of each KPI
(6) The target of the KPI
(7) Selected ASBU element(s) /Enabler(s) and/or Non ASBU solution(s) for each operational improvement
(8) Target Implementation date

Scope/ Applicability	KPA & Focus Area	Performance Objective	KPI/ Variant	KPI Baseline	KPI Target	Operational Improvements (ASBU Elements/Enablers & Non ASBU)	Target Date
1	2	3	4	5	6	7	8

APPENDIX A: OVERALL STATUS OF PRIORITY 1 ASBU THREADS

	DAIM	AMET	FICE	APTA	FRTO	NOPS	ACAS	SNET	GADS	RSEQ	SURF	ACDM	ASUR	NAVS	COMI	Average State implementation
Bahrain	100.00%	100.00%	40.00%	80.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	50.00%	100.00%	50.00%	100.00%	88.00%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Egypt	27.77%	87.50%	25.00%	65.33%	50.00%	0.00%	100.00%	100.00%	100.00%	0.00%	100.00%	50.00%	0.00%	50.00%	100.00%	57.04%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Iran	61.11%	18.75%	0.00%	24.17%	0.00%	0.00%	100.00%	100.00%	100.00%	NA	33.33%	0.00%	100.00%	0.00%	0.00%	38.38%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Iraq	0.00%	45.49%	0.00%	5.56%	0.00%	0.00%	100.00%	66.67%	100.00%	NA	100.00%	NA	100.00%	50.00%	100.00%	51.36%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Jordan	16.67%	97.25%	50.00%	60.00%	100.00%	0.00%	100.00%	100.00%	100.00%	NA	100.00%	NA	66.67%	100.00%	100.00%	76.20%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Kuwait	83.33%	78.13%	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%	100.00%	NA	100.00%	0.00%	66.67%	50.00%	100.00%	69.87%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Lebanon	16.67%	18.75%	NA	20.00%	0.00%	0.00%	100.00%	66.67%	0.00%	NA	100.00%	NA	0.00%	0.00%	50.00%	31.01%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Libya	0.00%	3.13%	NA	33.33%	NA	NA	0.00%	NA	100.00%	NA	100.00%	NA	NA	0.00%	0.00%	29.56%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Oman	16.67%	100.00%	33.33%	60.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	33.33%	50.00%	100.00%	0.00%	100.00%	70.95%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Qatar	100.00%	97.25%	100.00%	96.67%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.59%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Saudi Arabia	100.00%	100.00%	33.33%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%	33.33%	100.00%	33.33%	100.00%	100.00%	80.00%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Sudan	33.33%	32.64%	NA	20.00%	0.00%	0.00%	100.00%	66.67%	100.00%	NA	100.00%	NA	100.00%	100.00%	100.00%	62.72%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Syria	0.00%	0.00%	NA	4.17%	NA	NA	0.00%	NA	0.00%	NA	100.00%	NA	NA	0.00%	0.00%	11.57%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
UAE	100.00%	100.00%	75.00%	100.00%	50.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%	66.67%	100.00%	100.00%	86.11%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Yemen	0.00%	0.00%	NA	28.00%	NA	NA	100.00%	NA	0.00%	NA	100.00%	NA	NA	0.00%	0.00%	28.50%
	B1/1 B1/3 B1/4	B0/1 B0/2 B0/3 B0/4	B0/1	B0/1 B0/2 B0/4 B0/5 B0/7	B0/2 B0/4	B0/1	B1/1	B0/1 B0/2 B0/3	B1/2	B0/1	B0/1 B0/2 B0/3	B0/1 B0/2	B0/1 B0/2 B0/3	B0/3 B0/4	B0/7 B1/1	
Average regional implementation	46.73%	56.92%	39.39%	64.83%	64.88%	41.67%	86.67%	91.67%	80.00%	35.71%	66.67%	45.00%	65.28%	46.67%	70.00%	60.14%

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