International Civil Aviation Organization

MIDANPIRG/22 & RASG-MID/12 Meetings

(Doha, Qatar, 4 – 8 May 2025)

Agenda Item 5.2: MID Region Air Navigation priorities and targets

MID AIR NAVIGATION REPORT - 2024

(Presented by Secretariat)

SUMMARY

This paper presents the preliminary results of the MID Air Navigation Report 2024.

Action by the meeting is at paragraph 3

REFERENCE

- MIDANPIRG/21 & RASG-MID/11 (Abu Dhabi, UAE, 4 – 8 March 2024) meeting report
- RANP/NANP TF/2 (Cairo, Egypt, 17-19 February 2025)
- ICAO MID SL AN 1/7 – 24/185 dated 15 December 2024

1. INTRODUCTION

1.1 Reference is made to the MIDANPIRG/21 Report and in particular to Section 5.2 (MID Region Air Navigation priorities and targets,) para. 5.2.19 related to the development of the MID Air Navigation Report, urged all States to provide their inputs in a timely manner for the development of the next MID Air Navigation Report 2024.

2. DISCUSSION

2.1 The ICAO MID Office issued State Letter AN 1/7 – 24/185 dated 15 December 2024 to collect the following information and updates from MID States:

a) update on the status of implementation of the priority 1 ASBU Threads/Elements;

b) progress achieved in the implementation of the Performance Based Approach and development of State National Air Navigation Plan (NANP), by completing the Questionnaire; and

c) State’s major achievement(s)/success story(ies) in the air navigation field in 2024.

2.2 The meeting may wish to note that eleven (11) States (Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, UAE and Yemen) have replied to the aforementioned State Letter. Accordingly, ICAO MID, based on the above replies and the last update provided by remaining States in the Air Navigation Report 2023, consolidated the Draft report as at **Appendix A** which has been presented to RANP/NANP TF/2. The main outlines of the Draft report are as follows:

2.2.1 *Status of MID Priority 1 ASBU Threads/Elements implementation*

a) per ICAO MID ANP Volume III and ICAO MID Doc 002, this report included the status of 15 threats (DAIM, AMET, FICE, APTA, FRTO, NOPS, ACAS, SNET, GADS, RSEQ, SURF, ACDM, ASUR, NAVS and COMI) out of the 22 threats listed in 7th edition of the GANP;

b) this report incorporated the status of 34 priority 1 ASBU elements out of 232 elements included in the 7th edition of the GANP;

c) DAIM (B1/1, B1/3 & B1/4), the regional level of implementation ***increased*** to 47.19% compared to 46.73% in 2023;

d) AMET (B0/1, B0/2, B0/3 & B0/4), the regional level of implementation ***increased*** to 62.57% compared to 56.92% in 2023;

e) FICE (B0/1), the regional level of implementation ***increased*** to 45.31% compared to 39.39% in 2023;

f) APTA (B0/1, B0/2, B0/4, B0/5 & B0/7), the regional level of implementation ***increased*** to 69.64% compared to 64.83% in 2023;

g) FRTO (B0/2 & B0/4), the regional level of implementation ***increased*** to 69.05% compared to 64.88% in 2023;

h) NOPS (B0/1), the regional level of implementation ***increased*** to 45.83% compared to 41.67% in 2023;

i) ACAS (B1/1), the regional level of implementation is 86.67%, the ***same*** as the year 2023;

j) SNET (B0/1, B0/2 & B0/3), the regional level of implementation ***increased*** to 94.44% compared to 91.67% in 2023;

k) GADS (B1/2), the regional level of implementation is 80.00%, the ***same*** as the year 2023;

l) RSEQ (B0/1), the regional level of implementation ***increased*** to 50.00% compared to 35.71% in 2023;

m) SURF (B0/1, B0/2 & B0/3), the regional level of implementation ***increased*** to 88.89% compared to 66.67% in 2023;

n) ACDM (B0/1 & B0/2), the regional level of implementation ***increased*** to 60.00% compared to 45.00% in 2023;

o) ASUR (B0/1, B0/2 & B0/3), the regional level of implementation ***increased*** to 70.83% compared to 65.28% in 2023;

p) NAVS (B0/3 & B0/4), the regional level of implementation ***increased*** to 48.33% compared to 46.67% in 2023;

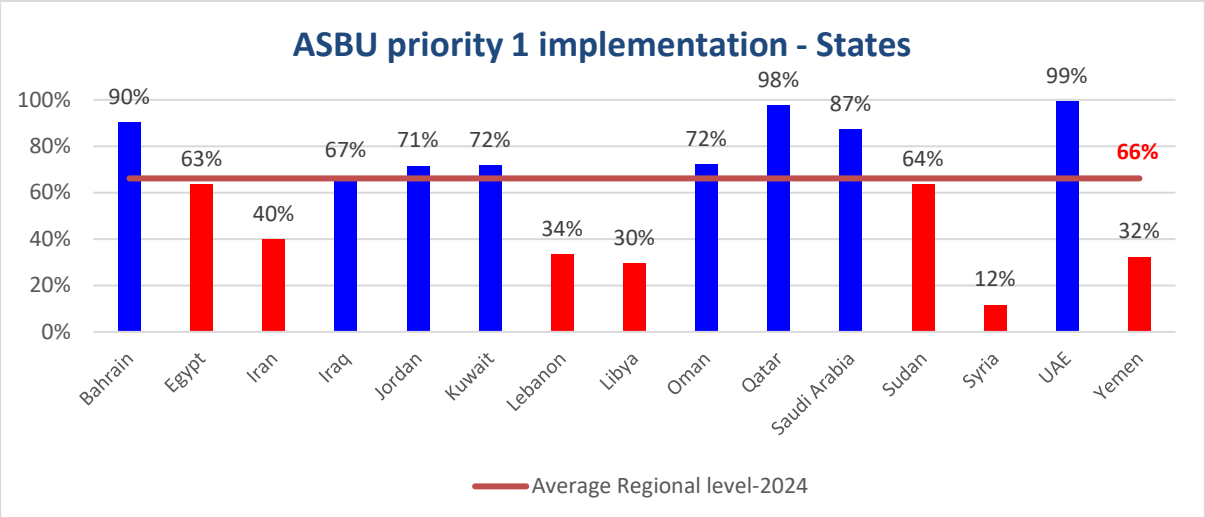
q) COMI (B0/7 & B1/1), the regional level of implementation ***increased*** to 73.33% compared to 70.00% in 2023;

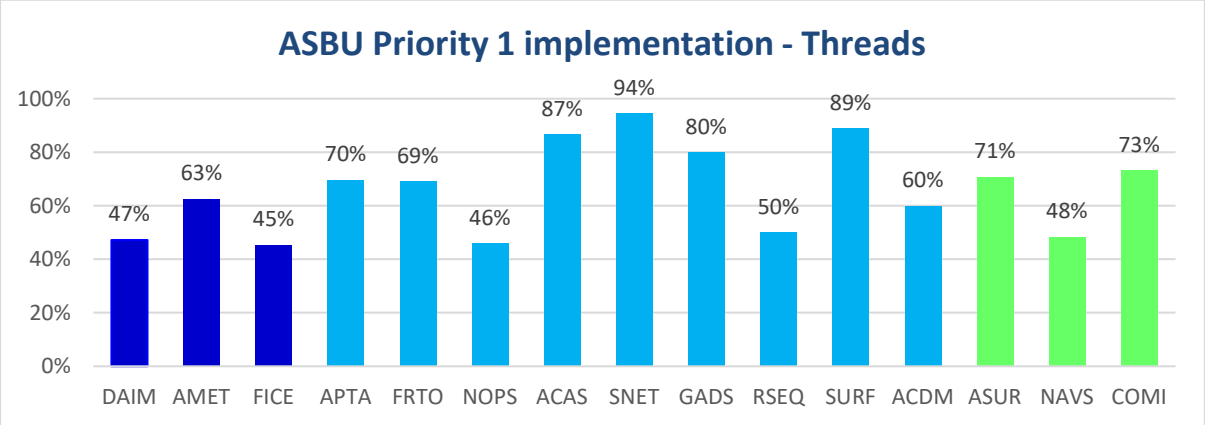
r) overall regional ASBU level of implementation ***increased*** to 66.14% compared to 60.14%

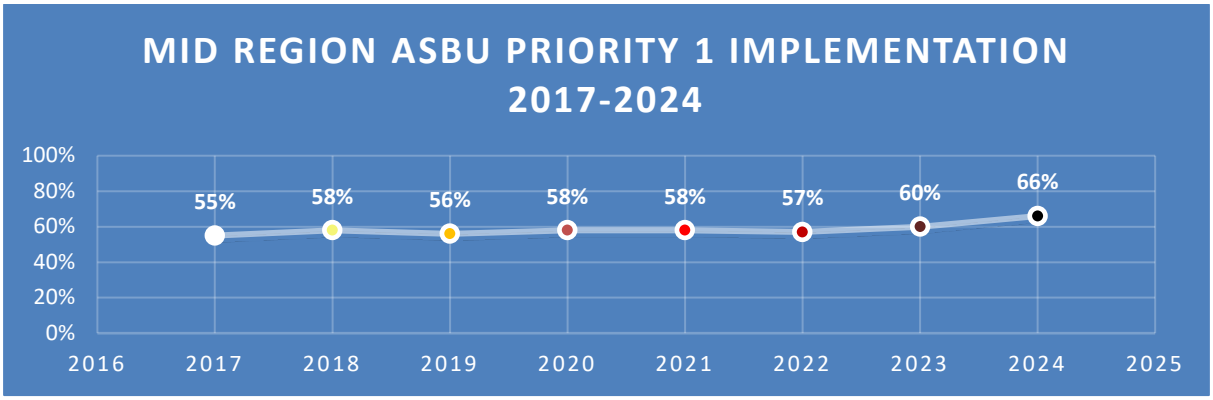
in 2023;

s) UAE, Qatar, Bahrain, and Saudi Arabia have the highest level of implementation with 99.17%, 97.59%, 90.33% and 87.22%, respectively; and

t) FICE, NOPS, DAIM, NAVS, & have the lowest level of implementation with 45.31%, 45.83%, 47.19% and 48.33%, respectively.







2.2.2 *MID State's major achievement(s)/success story(ies)*

The meeting may wish to note that Egypt, Iran, Iraq, Qatar, Saudi Arabia, UAE and Oman have

submitted report to ICAO MID regarding their respective States major achievements and success stories as presented at **Appendix A**.

2.3 Based on the above, the meeting may wish to agree to the following Draft Conclusion.

DRAFT MIDANPIRG CONCLUSION 22/XX: MID AIR NAVIGATION REPORT 2024

That, the MID Air Navigation Report-2024 is endorsed and be published by the ICAO MID Office.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the progress of implementation of Priority 1 ASBU Threads/Elements in the MID Region;

b) urge States to make additional effort to improve level of implementation of Priority 1 ASBU Threads/Elements and provide required feedback to ICAO MID;

c) urge States and MIDANPIRG SGs to review and assess the MID ASBU priority 2 elements and block 2 in order to identify and propose new MID ASBU Priority 1 to RANP/NANP TF/3 for further study and draft new version of MID Air Navigation Strategy which will be presented to MIDANPIRG/23 for endorsement; and

d) note major achievements/success stories reported by Egypt, Iraq, Qatar, Saudi Arabia, UAE and Oman in **Appendix A**; and

e) review and agree to the Draft Conclusion in para 2.3.

AIR NAVIGATION REPORT

ICAO Middle East Region

2024

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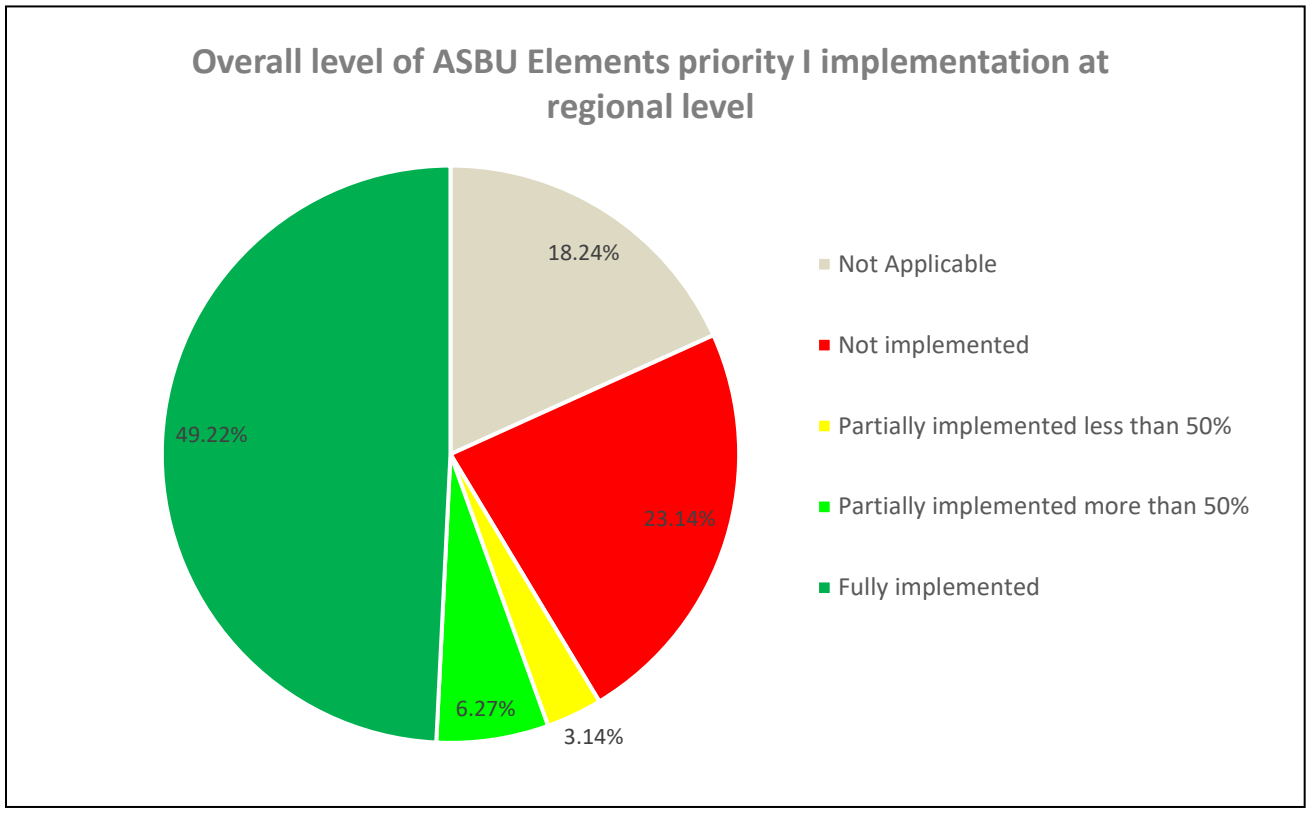
EXECUTIVE SUMMARY

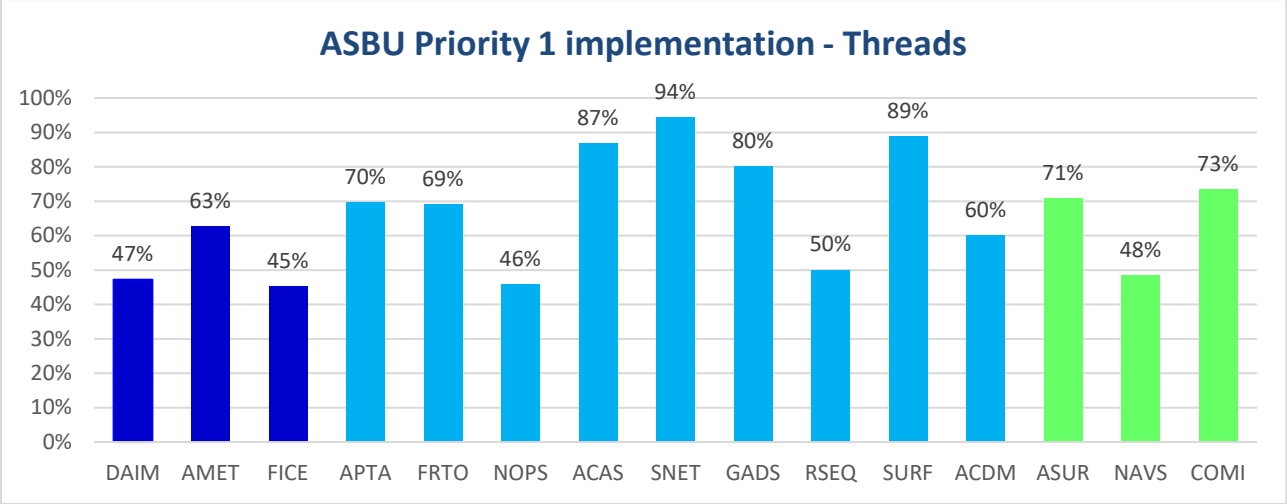
The ICAO MID Air Navigation Report - 2024 provides mainly an overview of the status of implementation of the Priority 1 ASBU Threads/ Elements in the MID Region.

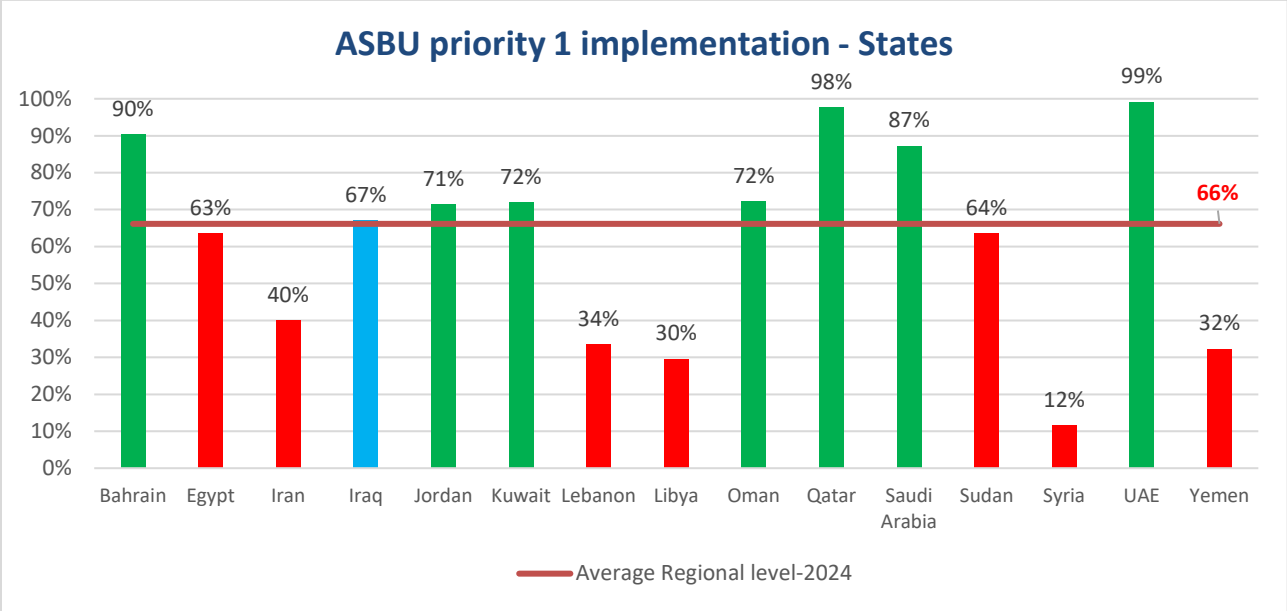
The overall implementation of priority 1 ASBU Threads/Elements in the MID Region is around **66.14%** in 2024. The MID Air Navigation Strategy (Edition March 2024) includes new Threads/ Elements that have been classified as Priority 1 for implementation in the MID Region. The implementation of some ASBU Threads has been acceptable/good (More than 70% per applicability area); such as, APTA, ACAS, SNET, GADS, SURF, ASUR, and COMI. 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, in order, UAE, Qatar, Bahrain, Saudi Arabia, Kuwait, Oman & Jordan 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 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

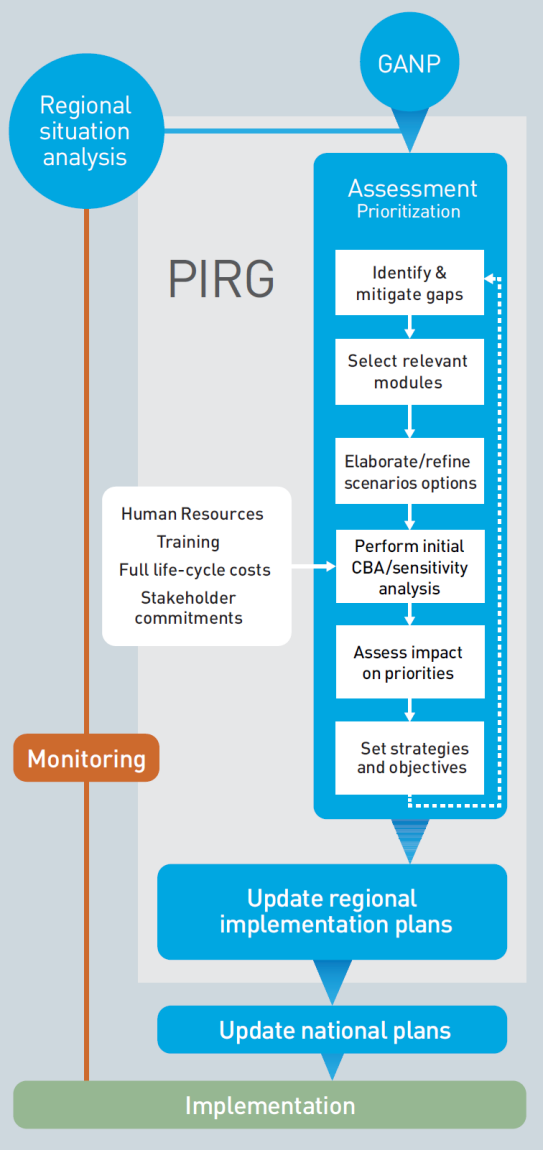
1.1 Objectives

The ICAO MID Region Air Navigation Report 2024 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 2024.

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 2024 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 2024) 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	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 2024 addresses the implementation status of the priority 1 ASBU Threads/Elements for the reference period January 2024 to December 2024.

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

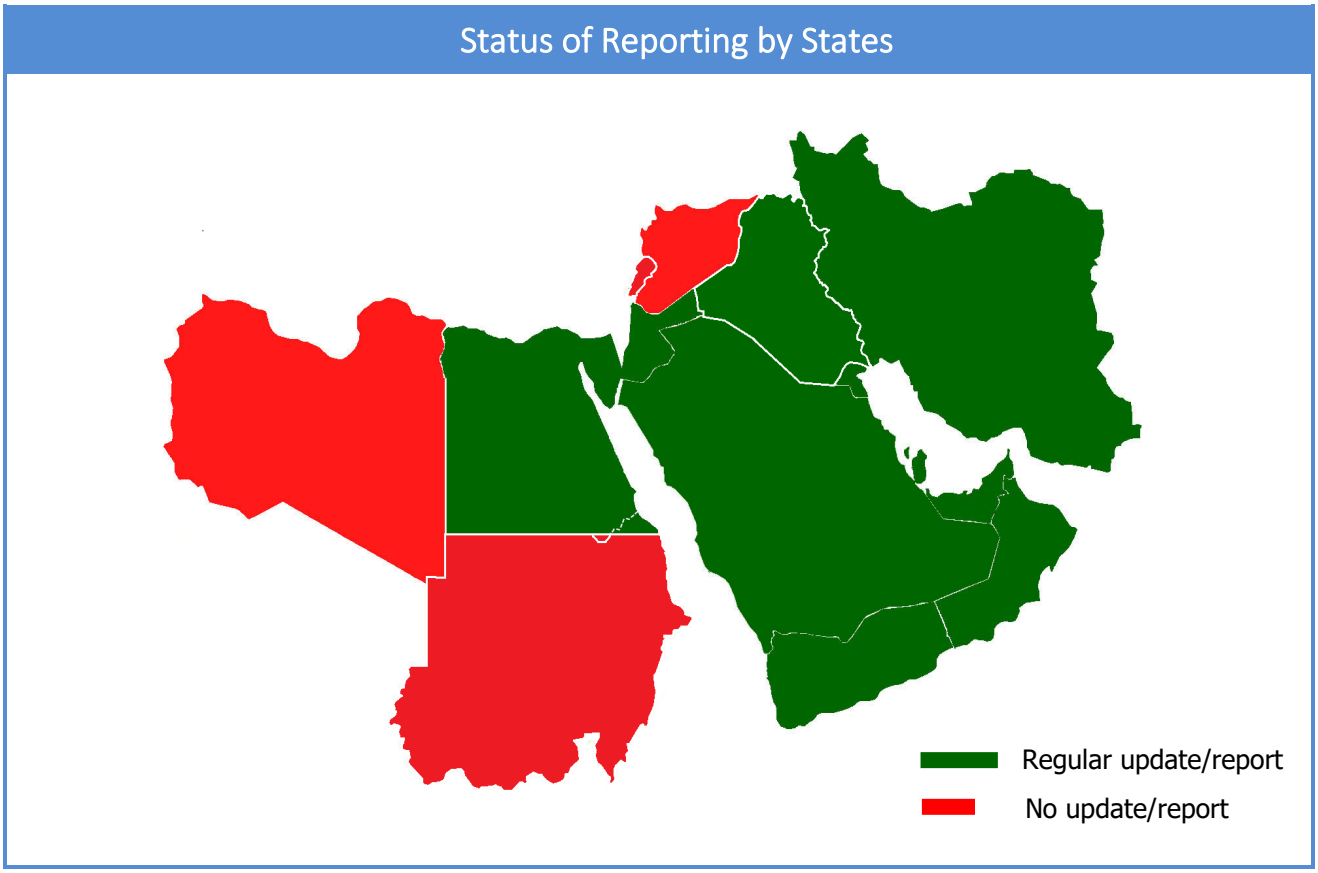
1.4 Collection of Data

For the purpose of collecting necessary data for the MID Air Navigation Report-2024, a State Letter Ref.: AN 1/7 – 24/185 was issued on 28 November 2024, to follow-up on the Report of the 21st Meeting of the MIDANPIRG, held in Abu Dhabi, UAE, 4 – 8 March 2024, and in particular to Section 5.2, which urged States to provide relevant data necessary for the development of the MID Region Air Navigation Report-2024. 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.

Status of Reporting by States



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.

- **Section 3** Success stories/best practices
Iraq, Kuwait and UAE

- **Section 4** 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

2.1 ASBU Implementation Status and Progress in the MID Region

2.1.1 B1-DAIM

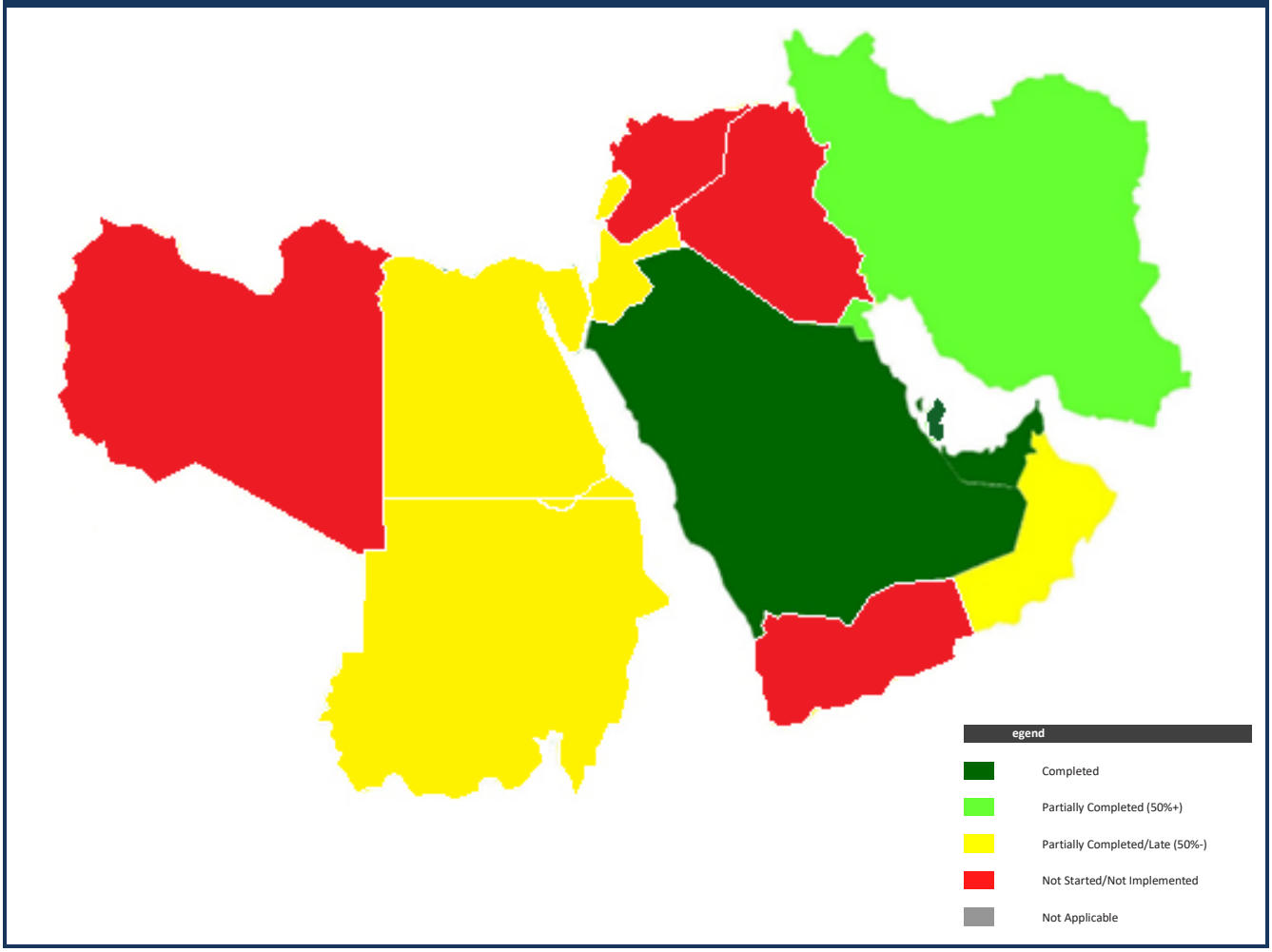
Improved aeronautical information based on enhanced data quality (accuracy, resolution, integrity, timeliness, traceability, completeness, format) to support Performance-Based Navigation (PBN), airborne computer-based navigation systems and ground automation. In addition, digital exchange and processing 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 **47.19%**.

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.

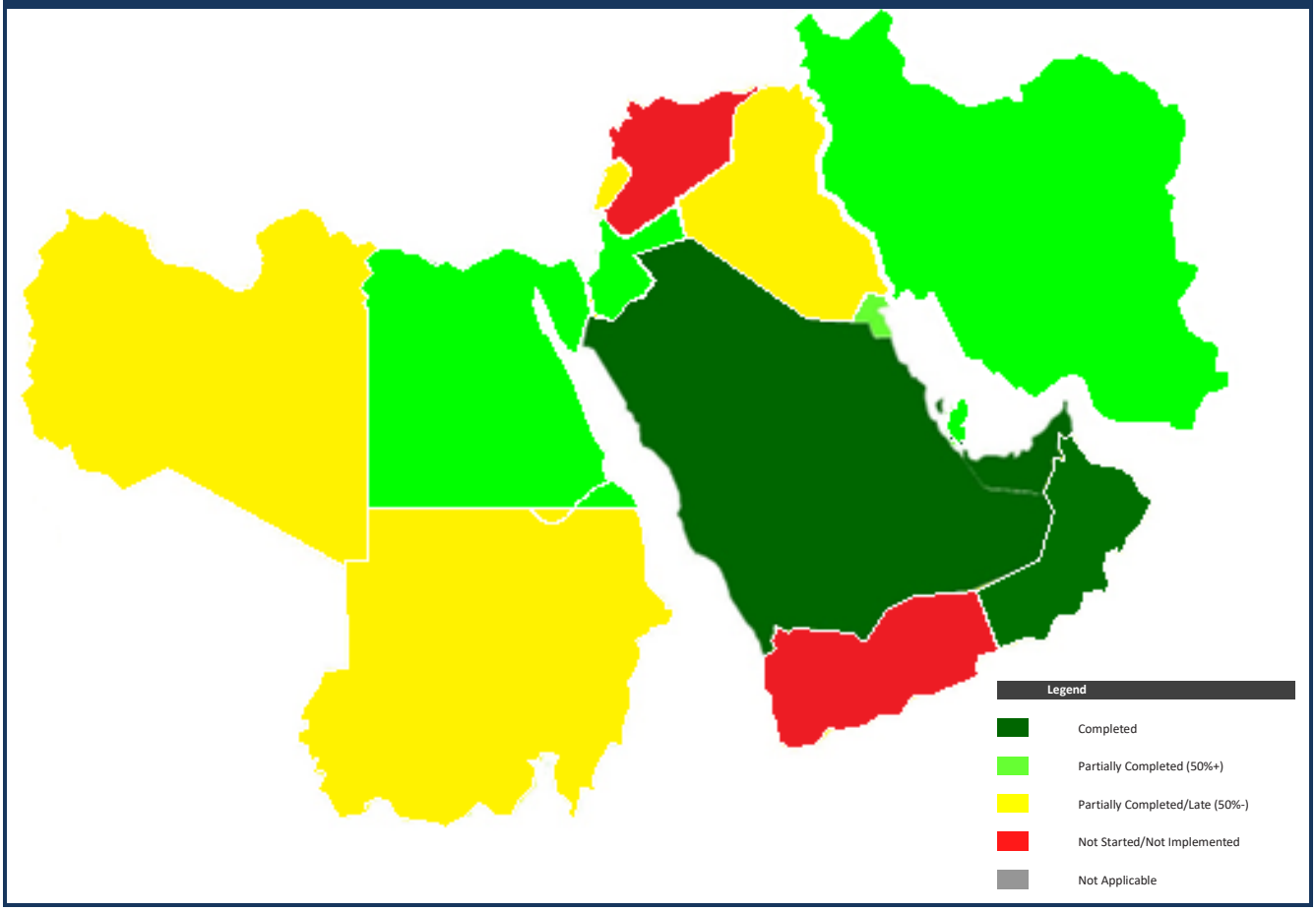
Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Information Threads							
AMET							
AMET B0/1	Meteorological observations products	All states	***Indicator*:*** Regional average implementation status of B0/1 (Meteorological observations products). ***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 **62.57%**.

AMET Status of implementation in the MID Region



2.1.3 B0-FICE

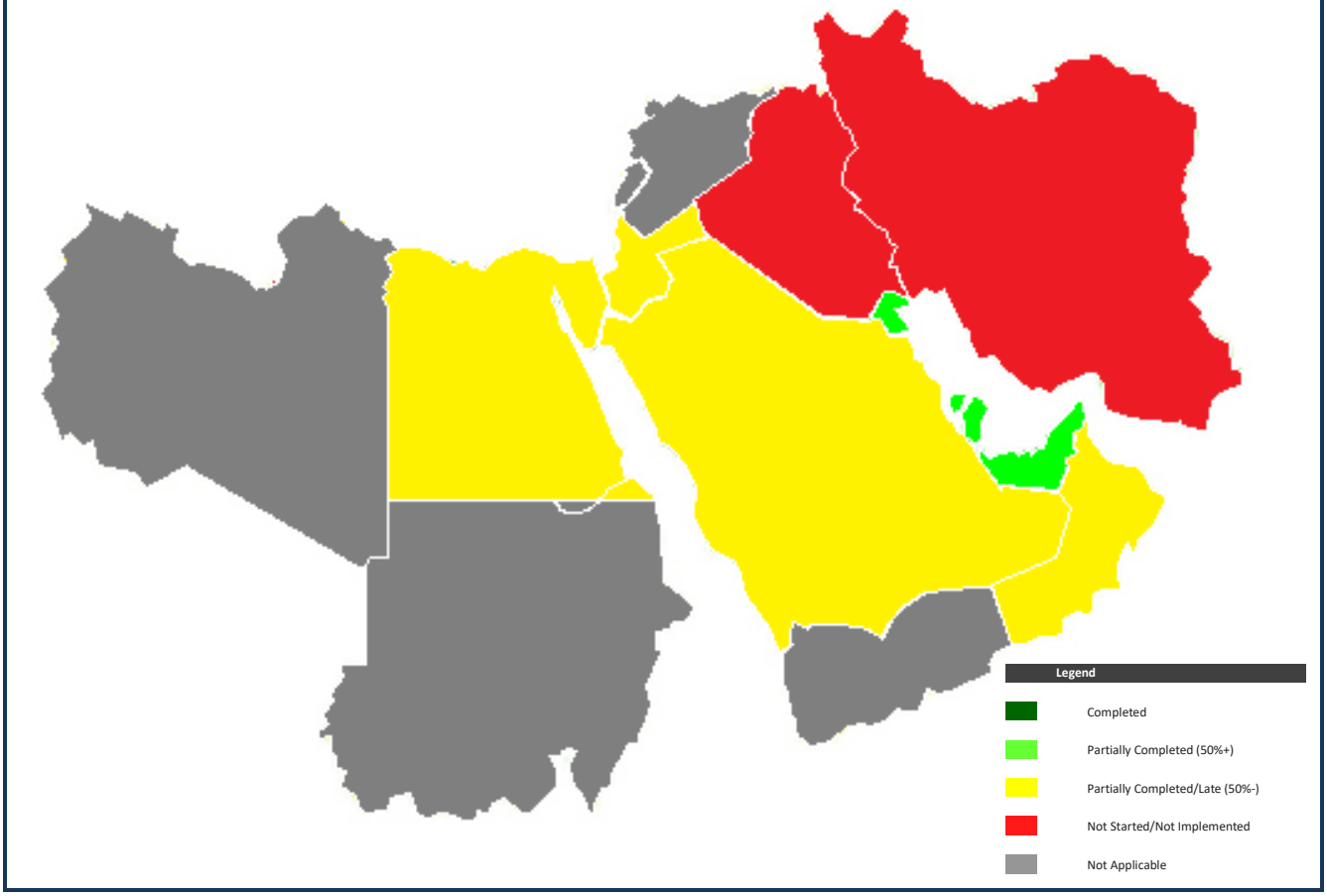
To improve coordination between air traffic service units (ATSUs) by using ATS interfacility flight data communication. The benefit is the improved efficiency through digital transfer of flight data.

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 **45.31%**.

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.

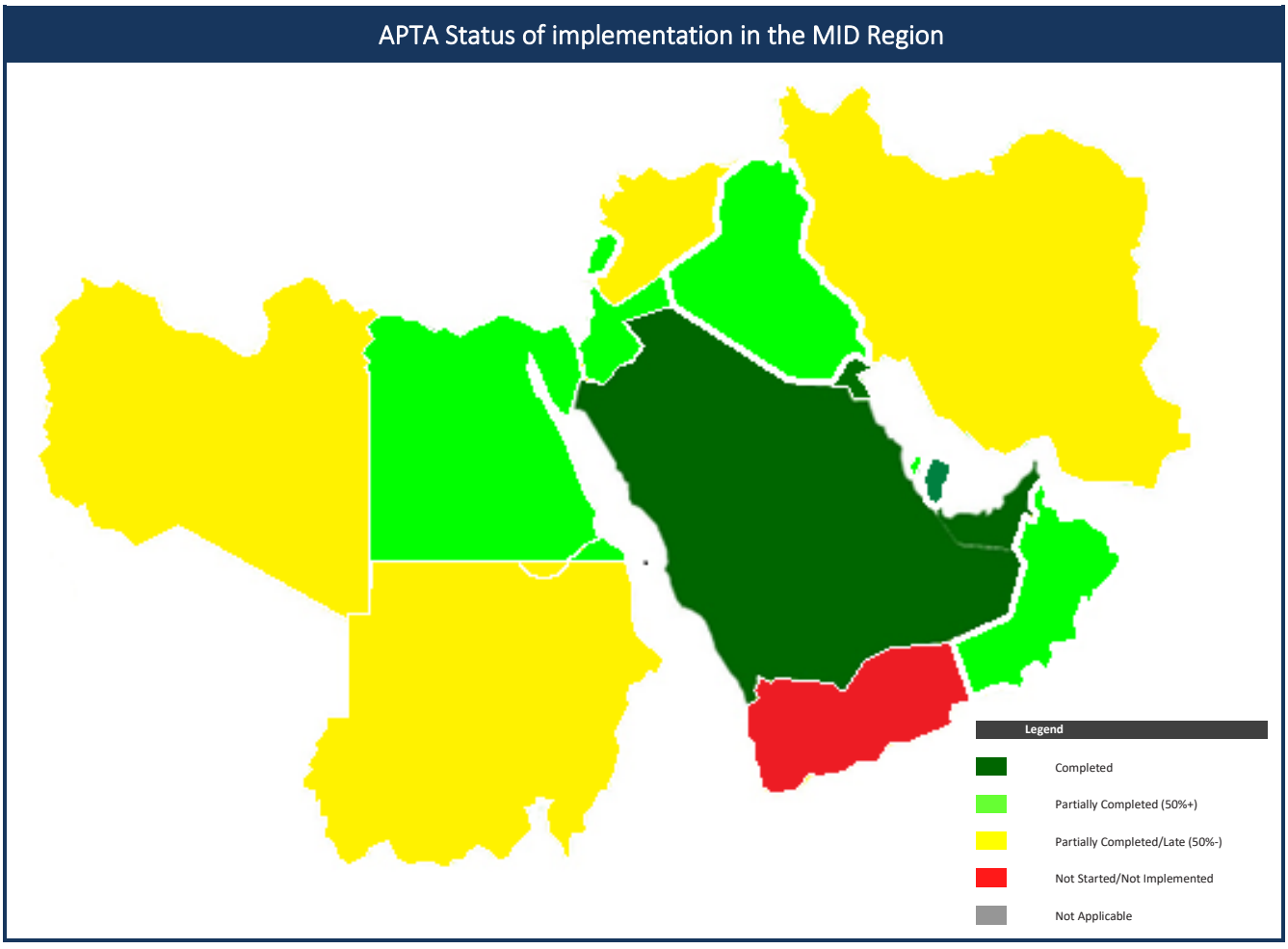
Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
APTA							
APTA B0/1	PBN Approaches (with basic capabilities)	All RWYs ENDs at International Aerodromes	***Indicator:*** % of Runway ends at international aerodromes served by PBN approach procedures with basic functionalities - down to LNAV or LNAV/VNAV Minima. ***Supporting metric:*** Number of Runways ends at international aerodromes served by PBN approach procedures with basic functionalities - down to LNAV or LNAV/VNAV minima.	(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,	***Indicator*:*** % of International Aerodromes with CDO	(2022) 65%	100%	Dec 2022	Efficiency KPI 19

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
		OLBA, OOMS, OTHH, OTBD, OEJN, OEMA,OEDF, OERK, HSSK, HSPN, OMAA, OMAL, OMAD, OMDW, OMDB, OMSJ, OMRK and OMFJ	implemented and published as required. ***Supporting Metric:*** Number of International Aerodromes with CDO implemented and published 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 and published as required. ***Supporting Metric:*** Number of International Aerodromes with CCO implemented and published 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: 1- having provisions for operational credits to enable lower minima based on advanced aircraft capabilities. (Reference: Annex 6 Part I para. 4.2.8.2.1) 2- Number of States Putting in place an approval process for the operational credit to Aircraft operator conducting PBAOM operations for low visibility operations	(2022) 50%	80%	Dec 2025	Capacity KPI 10

Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
			(Reference: Doc 9365 (AWO Manual)), as applicable.				

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 **69.64%**.



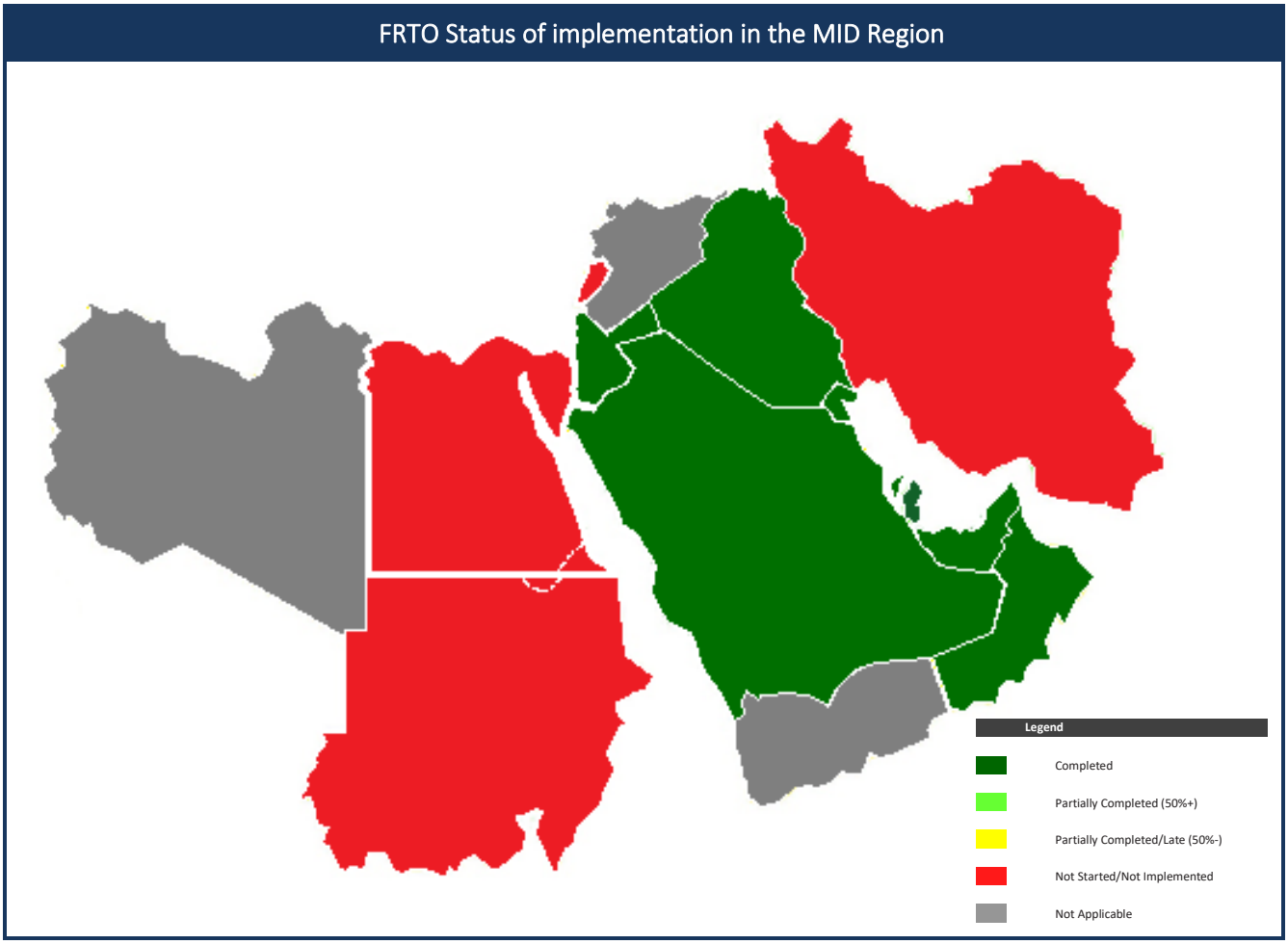
2.1.5 B0-FRTO

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 **69.05%**.



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:

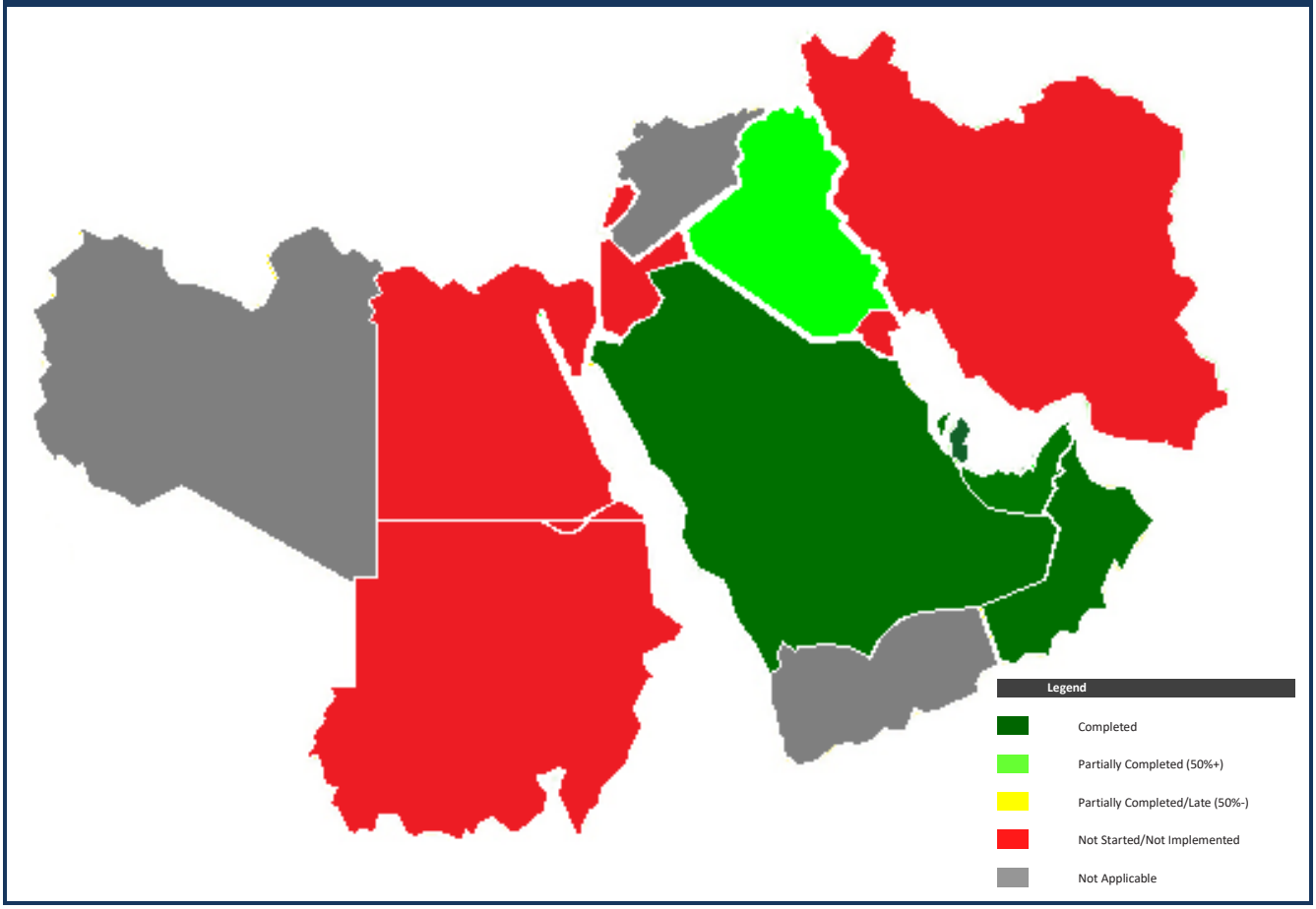
- smoothing flows and managing rates of sector entry;
- re-route traffic to avoid flow constraint areas;
- level capping;
- collaborative airspace management;
- ATFM slot management including departure information planning;
- adjust flow measures by use of enhanced collaborative flight planning and enhanced 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 **45.83%**

NOPS Status of implementation in the MID Region



2.1.7 B1-ACAS

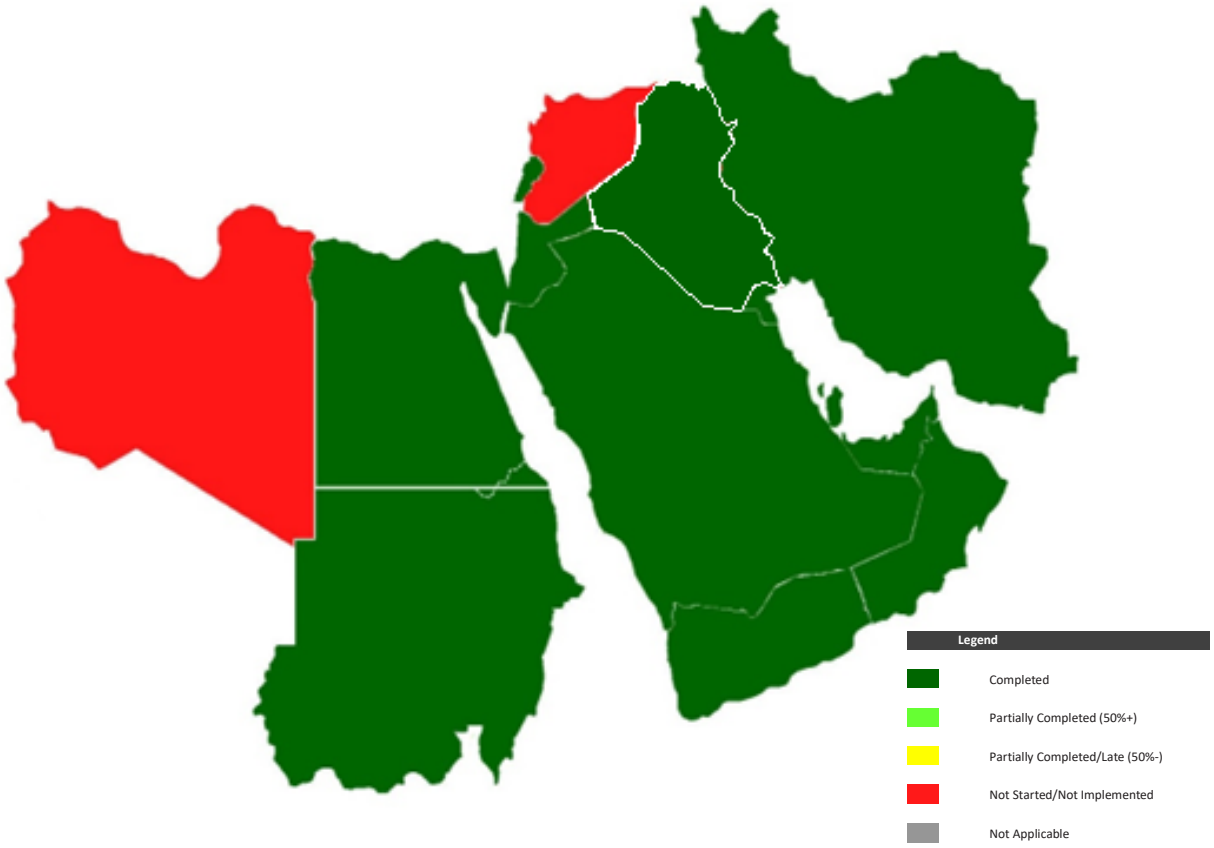
The traffic alert and collision avoidance system (TCAS) version 7.1 provides short-term improvements to existing airborne collision avoidance systems (ACAS) to reduce nuisance alerts as well as enhancing the logic for some geometries (i.e., Uberlinghen accident). This will reduce trajectory deviations 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.

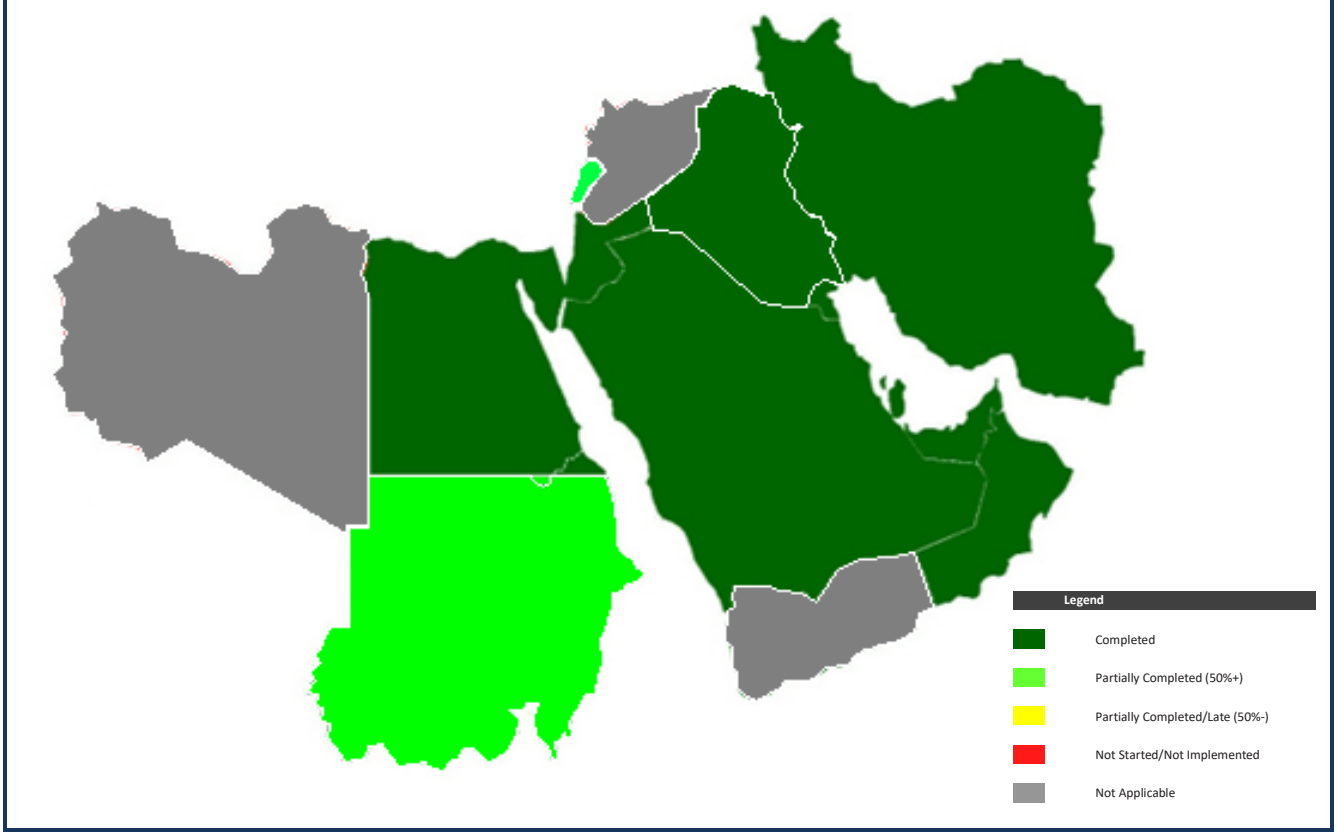
Element		Applicability	Performance Indicators/ Supporting Metrics	Baseline	Target	Timeline	KPA/ KPI
Operational Threads							
SNET							
SNET B0/1	Short Term Conflict Alert (STCA)	Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Sudan, UAE	***Indicator*:*** % of States 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 **94.44%**.

SNET Status of implementation in the MID Region



2.1.9 B1-GADS

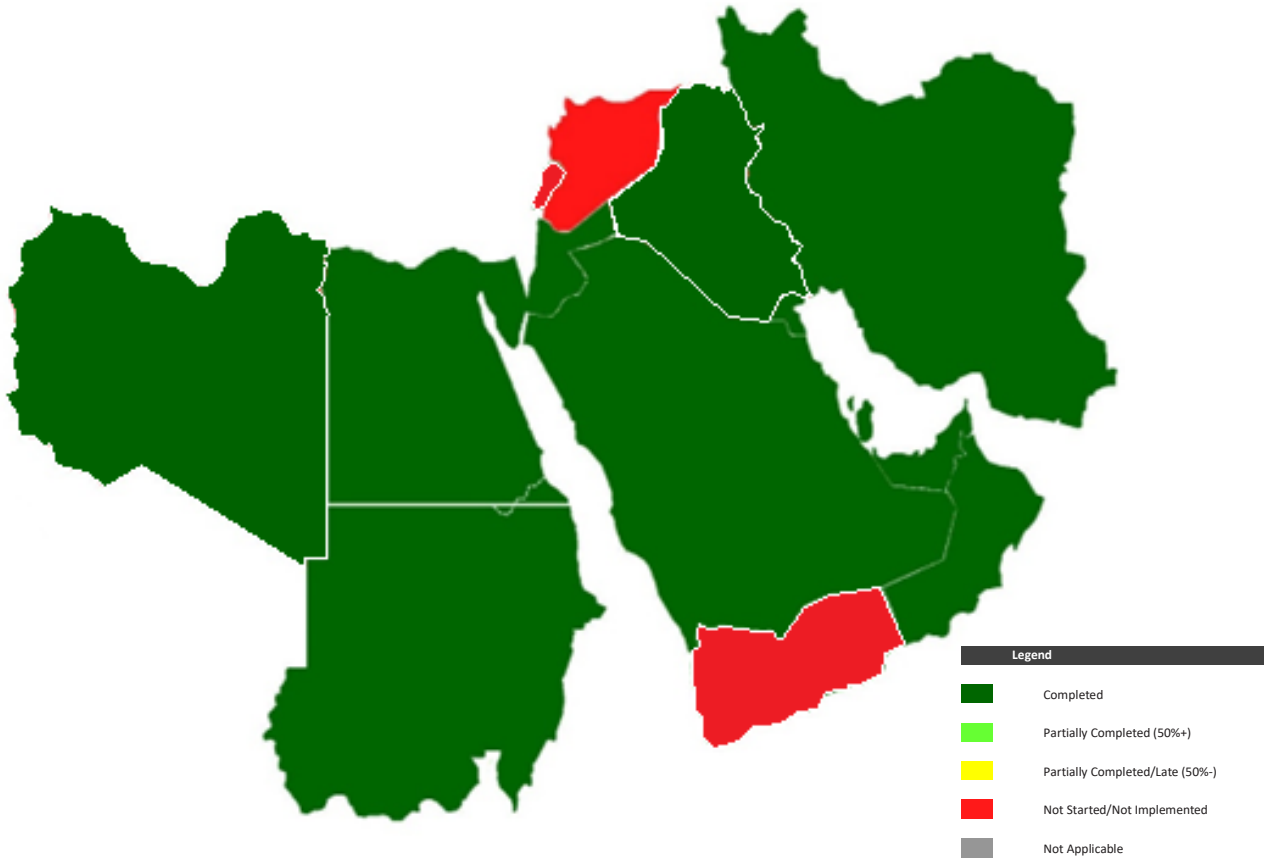
In oceanic areas without automatic surveillance, ATSU Alerting Service is supported with aircraft tracking capability implemented by the aircraft operator. Point of Contact (PoC) information is provided to facilitate establishing contact between relevant Stakeholders in emergency situations.

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

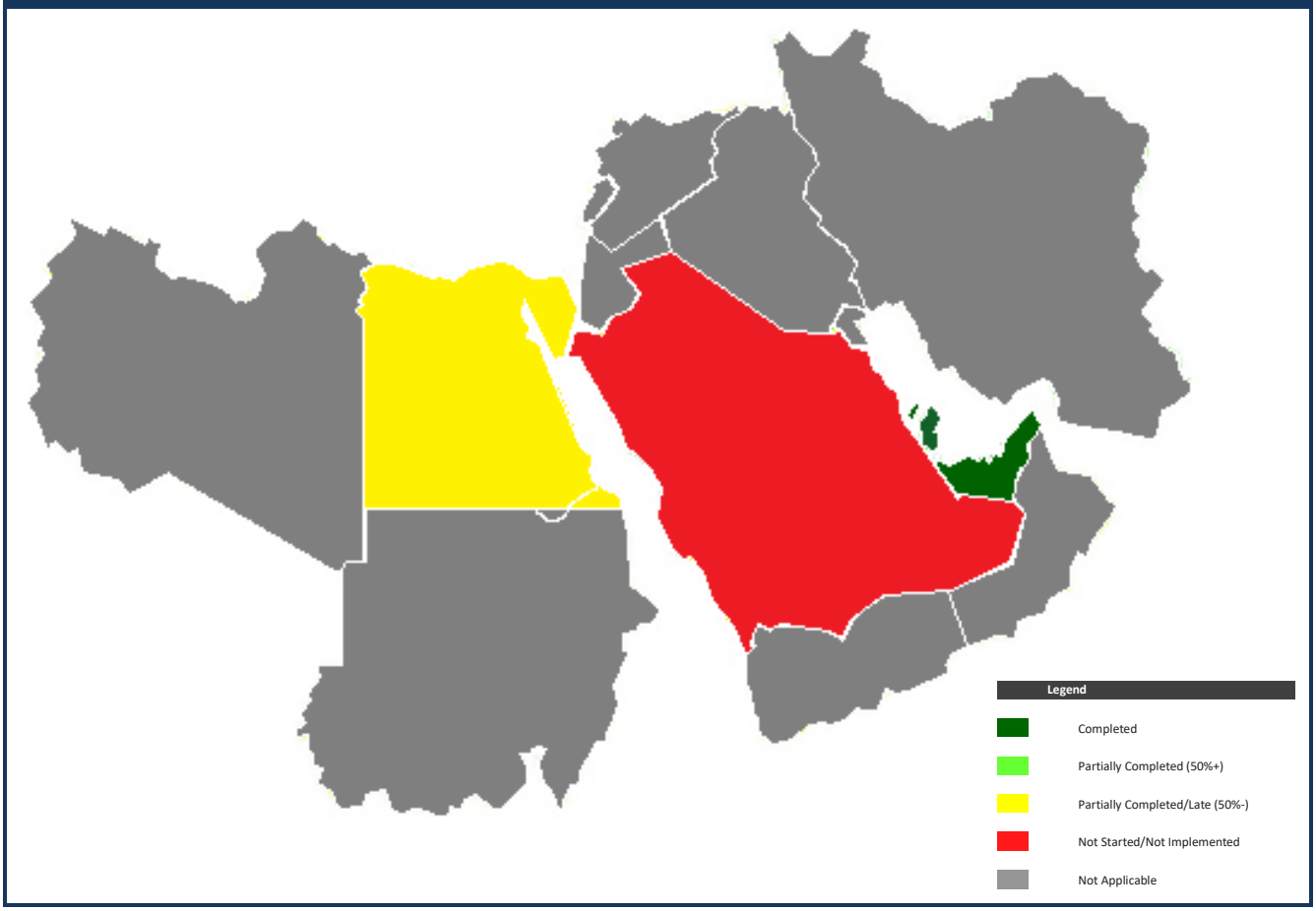
Arriving flights are "metered" and sequenced by arrival ATC based on inbound traffic predication information, optimizing runway utilization. Also departures are sequenced allowing improved start/push-back clearances, reducing the taxi time and ground holding, delivering more efficient departure sequences 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 **50.00%**.

RSEQ Status of implementation in the MID Region



2.1.11 B0-SURF

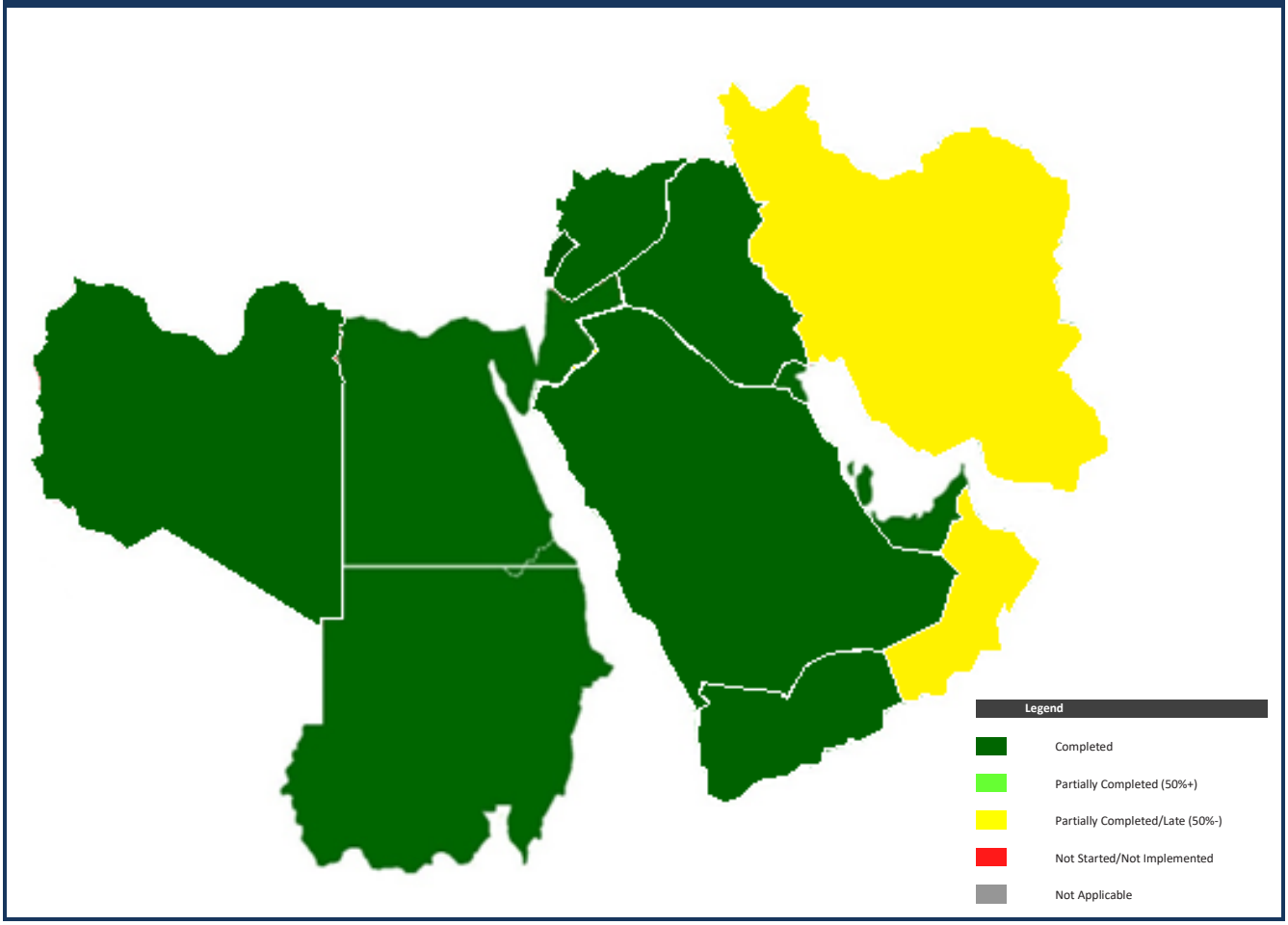
This module aims to enhance the situational awareness of Air Traffic Controllers and pilots during ground operations by the provision of the aerodrome surface situation on their respective displays being A-SMGCS for the controller or electronic maps in the cockpit. Some initial alerting services for 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 **88.89%**.

SURF Status of implementation in the MID Region



2.1.12 B0 & 1-ACDM

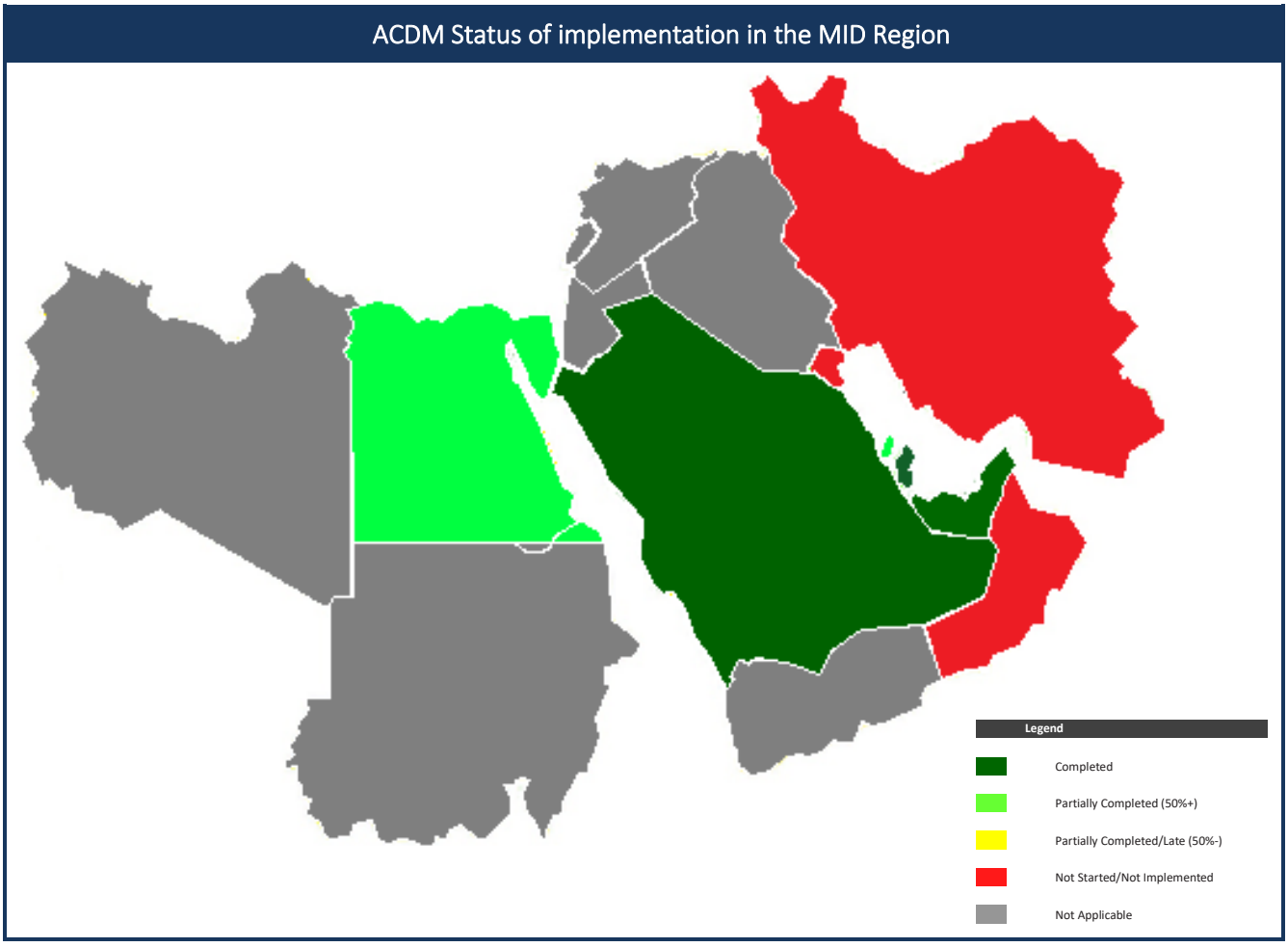
B0: Aerodrome operators, aircraft operators, air traffic controllers, ground handling agents, pilots and air traffic flow managers share live information that may be dynamic, in order to make better and coordinated decisions. This applies notably in day to day operations and also in case of severe weather 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 **60.00%**.



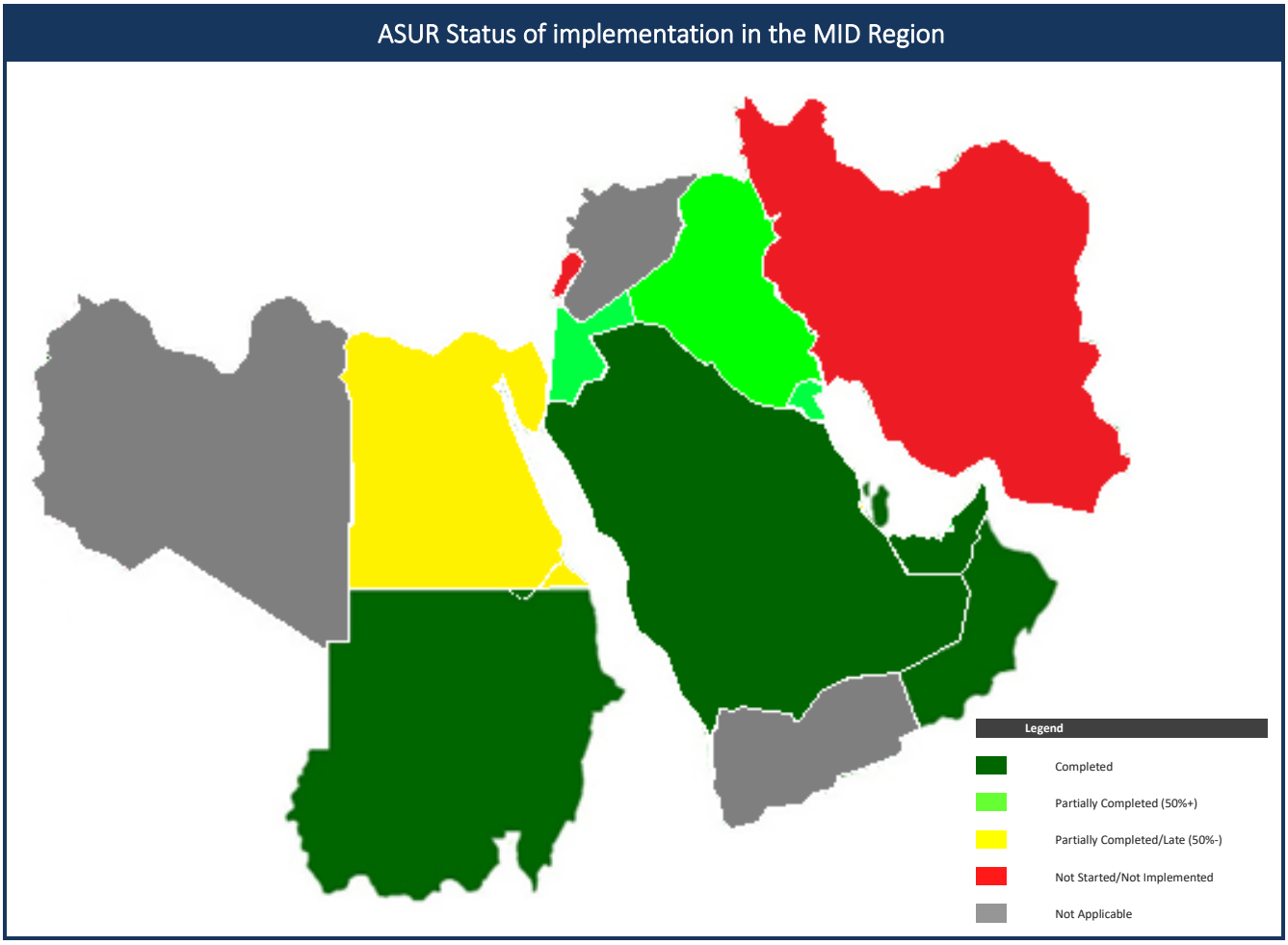
2.1.13 B0-ASUR

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 **70.83%**.



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.

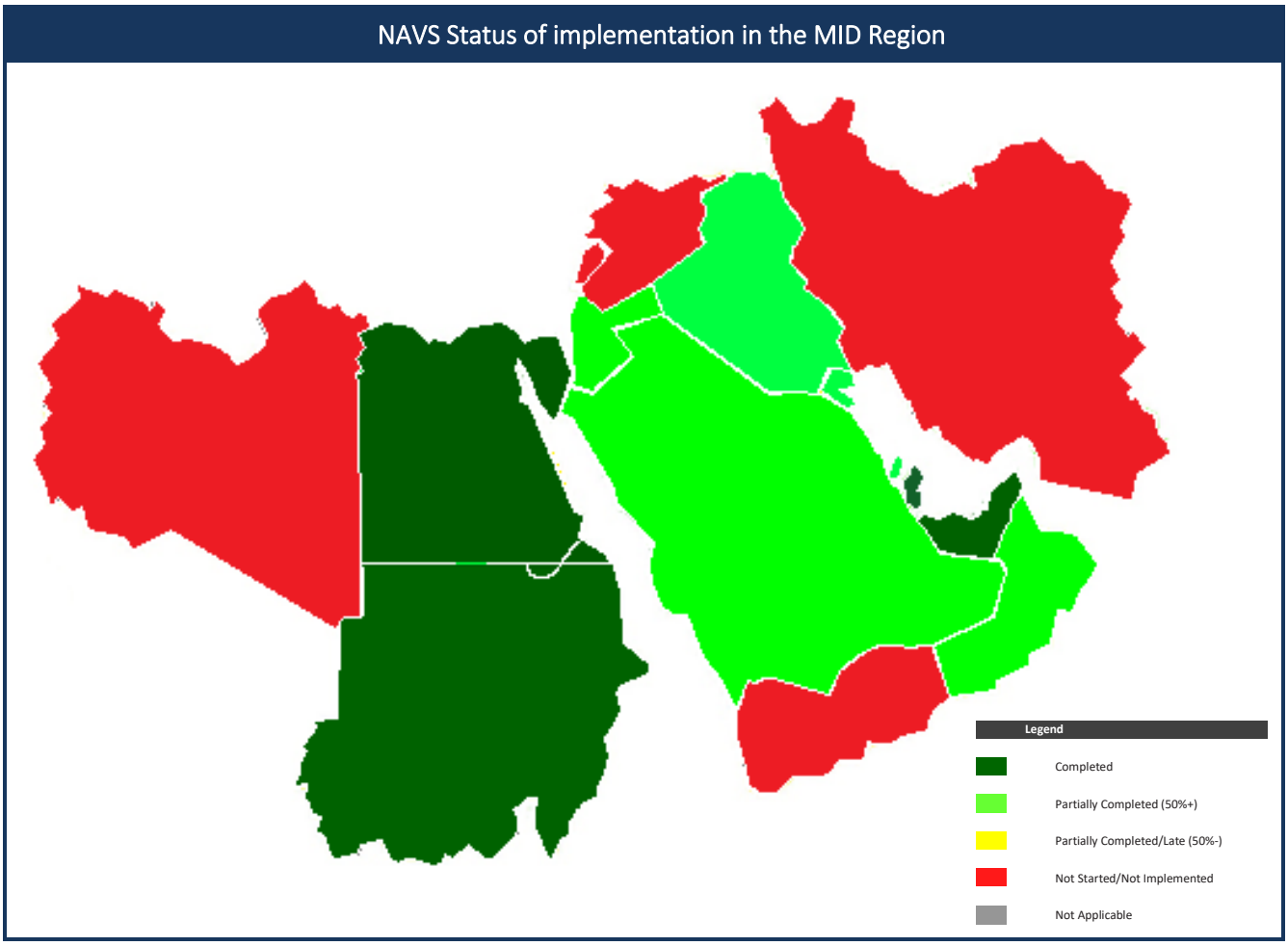
SBAS and ABAS are implemented as a mean to comply with ICAO Assembly Resolution A37-11 regarding Vertically-Guided Approach. SBAS is provided to support PBN in all phases of flight with increased accuracy and integrity. ABAS is provided to support non-precision (LNAV) and vertically-guided approach with 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 **48.33%**.



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:

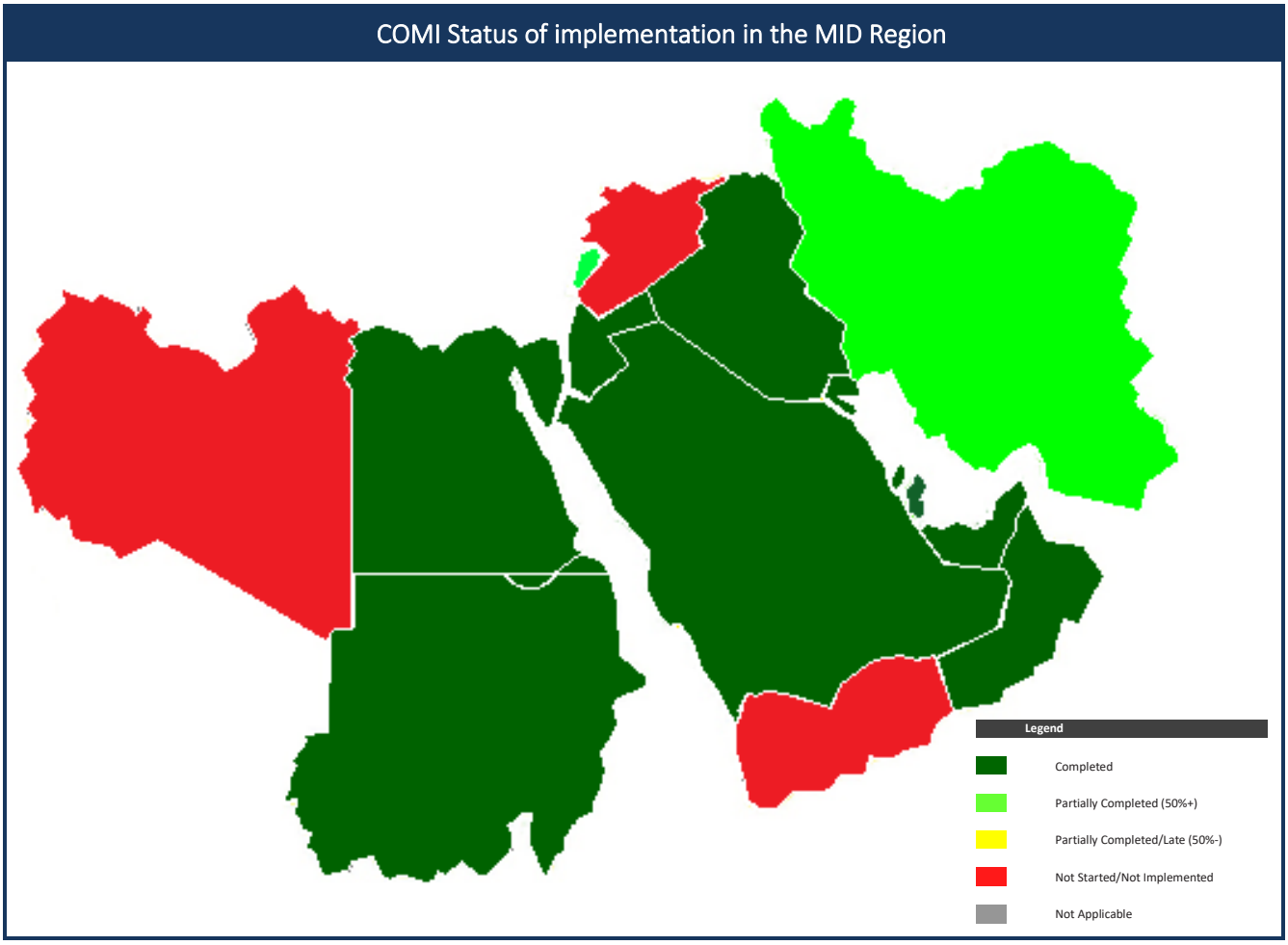
- AMHS with extension service to support XML, FTBP (IWXMM).
- Expansion of AIDC to enhance efficiency and safety.
- Implement regional IP networks.
- AeroMACS circuits for airport local communications.

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 **73.33%**.



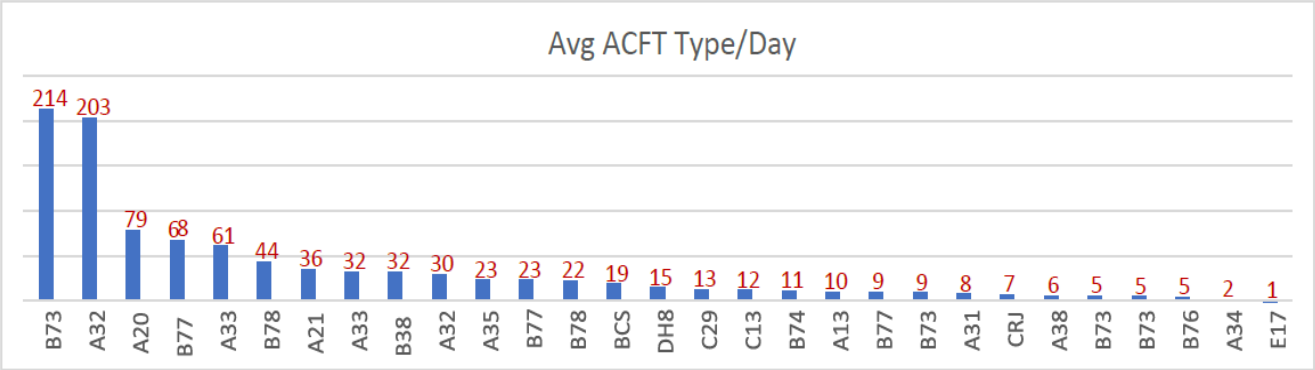
3. SUCCESS STORIES/BEST PRACTICES

Egypt

3.1 Cairo FIR optimization

3.1.1 The key findings from the Egypt Airspace Analysis regarding the type of aircraft operating in Cairo FIR:

- *Dominant Aircraft Types:* The Boeing 737-800 (B738) and Airbus A320 (A320) are the most prevalent aircraft in the Cairo FIR, followed by the Airbus A320neo (A20N).
- *Significant Wide-Body Traffic:* Boeing 777-300ER (B77W) and Airbus A330-300 (A333) aircraft exhibit substantial presence, with average daily frequencies of 68 and 61 respectively.
- *Boeing 787-9 Presence:* The Boeing 787-9 (B789) also contributes significantly, averaging 44 flights per day.
- *Other Notable Aircraft:* Airbus A321neo (A21N), Airbus A330-200 (A332), and Boeing 737 MAX (B38M) aircraft maintain a noticeable presence, albeit with lower daily frequencies.



3.1.2 As the majority of air traffic within the Cairo FIR consists of narrow-body aircraft, the optimization analysis will be conducted with a specific focus on the operational characteristics of the Boeing 737 and Airbus A320 series, which represent the most common aircraft types in this category.

a) A direct route between (BLT-DATOK) for inbound traffic from Nicosia FIR via entry point RASDA to Amman FIR via exit point ULINA.

Benefits and Expected Outcomes	
Distance Reduction	45.3 nm
Time Savings	Approx. 6 MINs
Fuel Efficiency	209.5 kg
Emissions Reduction per flight	662.1 kg
Emissions Reduction for the new ATS route per day	2648.24kg
Cost Savings per Flight	113 $
Cost Savings for the new ATS route per day	453 $

b) A direct route between (BLT-SISIK) for inbound traffic from Athens and Nicosia landing HESH to avoid the congested portion of (BLT-CVO-MENLI).

Benefits and Expected Outcomes	
Distance Reduction	21.3 NM
Time Savings	Approx. 3 MINs
Fuel Efficiency	98.8 kg
Emissions Reduction	311.3 kg
Emissions Reduction for the new ATS route per day	4358.2 kg
Cost Savings per Flight	53 $
Cost Savings for the new ATS route per day	745 $

c) A direct route between KUNKI and TANSA would generally result in:

Benefits and Expected Outcomes	
Distance Reduction	14.7 NM
Time Savings	Approx. 2 MINs
Fuel Efficiency	68 kg
Emissions Reduction	214.8 kg
Emissions Reduction for the new ATS route per day	1718.7 kg
Cost Savings per Flight (USD)	37 $
Cost Savings for the new ATS route per day	294 $

d) A direct route between (PAXIS-OBRAN) would generally result in:

Benefits and Expected Outcomes	
Distance Reduction	7.9 NM
Time Savings	Approx. 1 MINs
Fuel Efficiency per flight	36.5 kg
Emissions Reduction per flight	111.5 kg
Emissions Reduction for the new ATS route per day	3925.5 kg
Cost Savings per Flight (USD)	20 $
Cost Savings for the new ATS route per day	671 $

e) A direct route between (DASUM-FYM) would generally result in:

Benefits and Expected Outcomes	
Distance Reduction	19.5 NM
Time Savings	Approx. 3 MINs
Fuel Efficiency	90.2 kg
Emissions Reduction per flight	285 kg
Emissions Reduction for the new ATS route per day	13394.6kg
Cost Savings per Flight (USD)	49 $
Cost Savings for the new ATS route per day	2289 $

f) A direct route between (BRN-NUBAR) would generally result in:

Benefits and Expected Outcomes	
Distance Reduction	5.2 NM
Time Savings	Approx.1 MINs
Fuel Efficiency	24.1 kg
Emissions Reduction per flight	76 kg
Emissions Reduction for the new ATS route per day	1443.9 kg
Cost Savings per Flight (USD)	13 $
Cost Savings for the new ATS route per day	247 $

g) A direct route between (SML-MMA) would generally result in:

Benefits and Expected Outcomes	
Distance Reduction	10.6 NM
Time Savings	Approx. 1 MINs
Fuel Efficiency	49 kg
Emissions Reduction per flight	154.9 kg
Emissions Reduction for the new ATS route per day	774.6 kg
Cost Savings per Flight (USD)	26 $
Cost Savings for the new ATS route per day	132 $

h) A direct route between (SISID-KUNAK) would generally result in:

Benefits and Expected Outcomes	
Distance Reduction	7.3 NM
Time Savings	Approx. 1 MINs
Fuel Efficiency	33.8 kg
Emissions Reduction per flight	106.7 kg
Emissions Reduction for the new ATS route per day	746.8 kg
Cost Savings per Flight (USD)	18 $
Cost Savings for the new ATS route per day	128 $

i) A direct route between (LUGAV-AST) would generally result in:

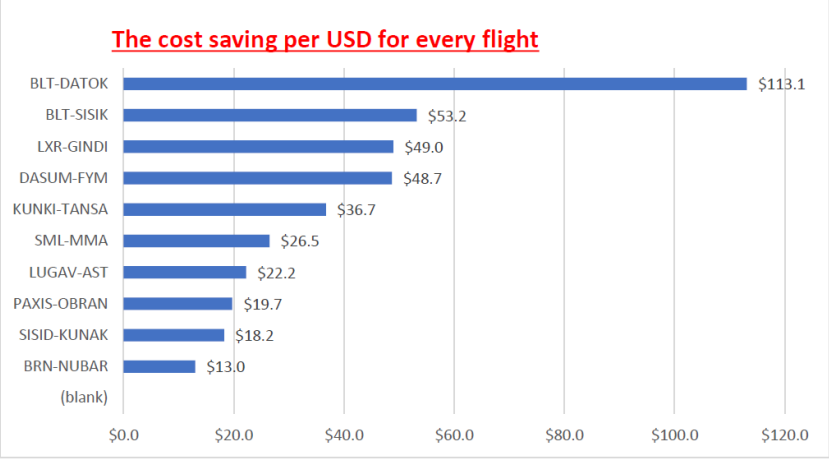
Benefits and Expected Outcomes	
Distance Reduction	8.9 nm
Time Savings	Approx. 1 MINs
Fuel Efficiency	41.2 kg
Emissions Reduction	130.1 kg
Emissions Reduction for the new ATS route per day	1170.6 kg
Cost Savings per Flight (USD)	22 $
Cost Savings for the new ATS route per day	200 $

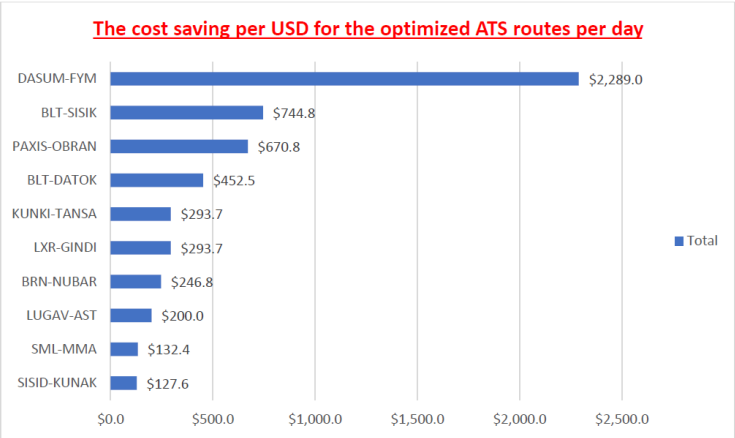
j) direct route between (LXR-GINDI) would generally result in:

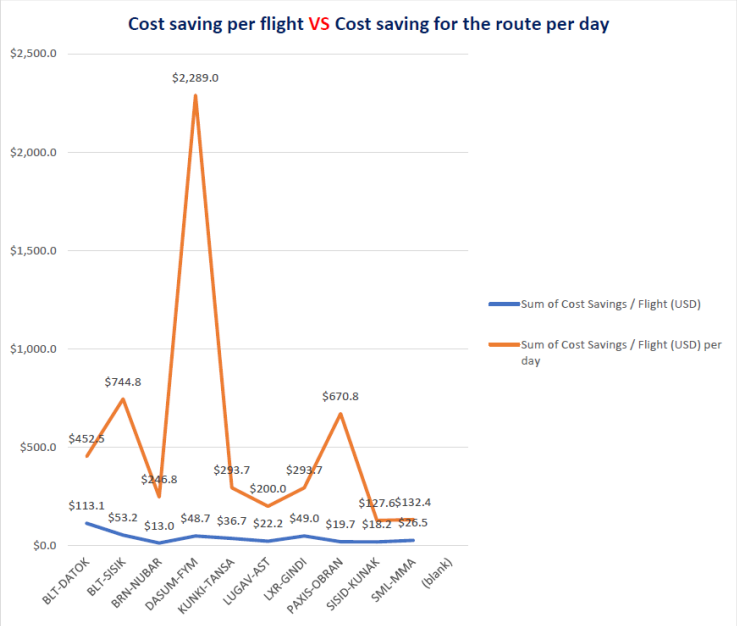
Benefits and Expected Outcomes	
Distance Reduction	19.6 nm
Time Savings	Approx. 3 MINs
Fuel Efficiency	90.6 kg
Emissions Reduction	338.1 kg
Emissions Reduction for the new ATS route per day	1718.7 kg
Cost Savings per Flight (USD)	49 $
Cost Savings for the new ATS route per day	294 $

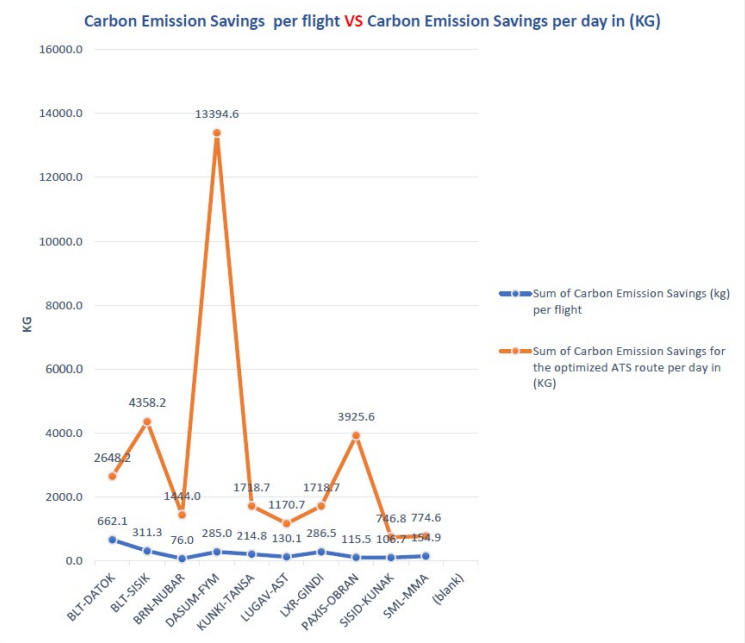
3.1.3 The dualization of A16 into two distinct routes, one for southbound and another for northbound traffic via waypoint AZMEY, offers several key advantages:

- Increased Airspace Capacity: By segregating traffic flow, dualization effectively doubles the capacity of the A16 corridor. This allows for a greater number of aircraft to transit the airspace safely and efficiently.
- Enhanced Safety: Separating conflicting flight paths significantly reduces the risk of mid-air collisions and other safety incidents. This is particularly beneficial for traffic converging from or diverging towards the Nicosia FIR.
- Reduced Controller Workload: The separation of traffic flow simplifies air traffic management, reducing the complexity of airspace coordination and minimizing the cognitive burden on air traffic controllers.
- Overall, the dualization of A16 represents a significant improvement in airspace management, enhancing safety, efficiency, and capacity within sector 2.




The cost saving per USD for the optimized ATS routes per day
DASUM-FYM
BLT-SISIK
PAXIS-OBRAN
BLT-DATOK
KUNKI-TANSA
LXR-GINDI
BRN-NUBAR
LUGAV-AST
SML-MMA
SISID-KUNAK
$2,289.0
$744.8
$670.8
$452.5
$293.7
$293.7
$246.8
$200.0
$132.4
$127.6
$0.0
$500.0
$1,000.0
$1,500.0
$2,000.0
$2,500.0
Total


Cost saving per flight VS Cost saving for the route per day
$2,500.0
$2,000.0
$1,500.0
$1,000.0
$500.0
$0.0
$2,289.0
$744.8
$670.8
$452.5
$246.8
$293.7
$293.7
$200.0
$127.6
$132.4
$113.1
$53.2
$13.0
$48.7
$36.7
$22.2
$49.0
$19.7
$18.2
$26.5
BLT-DATOK
BLT-SISIK
BRN-NUBAR
DASUM-FYM
KUNKI-TANSA
LUGAV-AST
LXR-GINDI
PAXIS-OBRAN
SISID-KUNAK
SML-MMA
(blank)
Sum of Cost Savings / Flight (USD)
Sum of Cost Savings / Flight (USD) per day


Carbon Emission Savings per flight VS Carbon Emission Savings per day in (KG)
KG
16000.0
14000.0
12000.0
10000.0
8000.0
6000.0
4000.0
2000.0
0.0
13394.6
4358.2
3925.6
2648.2
1444.0
1718.7
1718.7
1170.7
774.6
746.8
662.1
311.3
76.0
285.0
214.8
130.1
286.5
115.5
106.7
154.9
BLT-DATOK
BLT-SISIK
BRN-NUBAR
DASUM-FYM
KUNKI-TANSA
LUGAV-AST
LXR-GINDI
PAXIS-OBRAN
SISID-KUNAK
SML-MMA
(blank)
Sum of Carbon Emission Savings (kg) per flight
Sum of Carbon Emission Savings for the optimized ATS route per day in (KG)

Iran

3.2 Electronic Flight Strip System (EFSS) developed and implemented by Iran

3.2.1 The need to eliminate the paper-based flight strip writing process, standardize strip marking by air traffic control personnel, and provide services to facilitate this process, along with collecting flight strip data in digital format on databases and utilizing this data for statistical reporting and secondary processing, led us to initiate the design and implementation of the Electronic Flight Strip System.

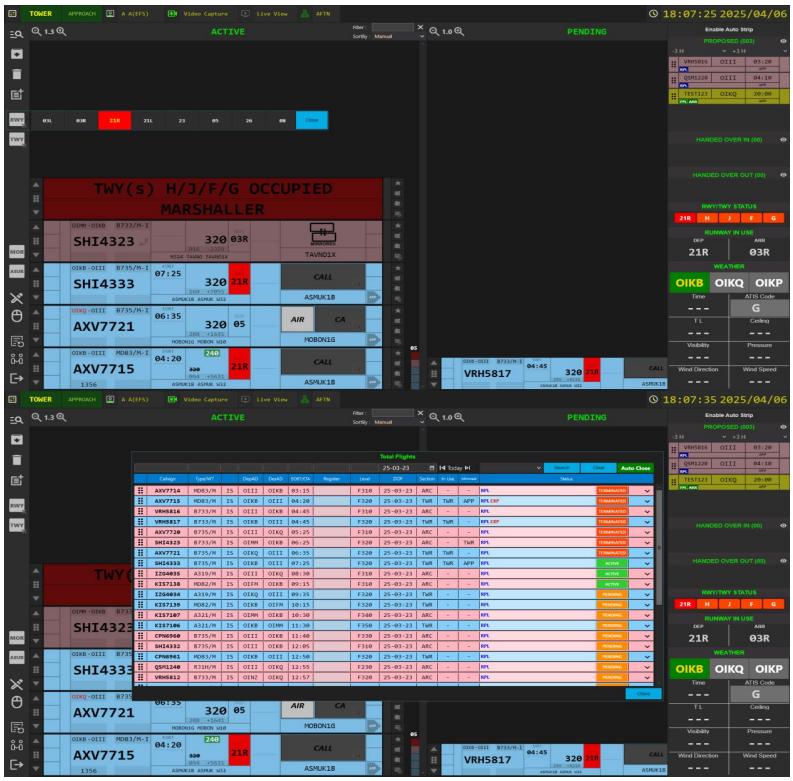
3.2.2 The design and implementation of the Electronic Flight Strip System have been carried out internally by experts from the General Directorate of Aeronautical Telecommunications and Information Technology at the Iran Airports and Air Navigation Company.

3.2.3 The Electronic Flight Strip System utilizes the AFTN service for sending and receiving aeronautical messages. It processes and categorizes all incoming aeronautical messages based on the standards outlined in Document 4444 and Annex 10, Volume II and other ICAO annexes and documents. Additionally, all messages generated and transmitted by the Electronic Flight Strip System comply with these referenced documents.

3.2.4 The Electronic Flight Strip System also integrates with other locally developed systems at the Iran Airports and Air Navigation Company, such as the Zagros System (ASUR) and Iran's e-FPL System via the AFTN service or through API connections. This integration facilitates the workflow of air traffic controllers by enabling seamless data exchange.

3.2.5 The Electronic Flight Strip System also provides features and solutions such as Mirroring Mode and Assist Mode to reduce verbal coordination between different air traffic control units such as Approach, Tower, Ground, and Clearance Delivery. These capabilities enhance the pre-planning process for flights that need to be hand over to the relevant unit and are particularly beneficial in high-traffic conditions.

3.2.6 The Electronic Flight Strip System is designed to eliminate verbal coordination between airport air traffic control units and ACC at airports equipped with RADAR automation system such as FDP and RDP. It functions as an interface between airport RADAR automation system and incoming aeronautical messages via the AFTN service, facilitating the exchange of EST and CPL messages between units for more coordination.



3.3 Development and installation of 3D Tower Simulators in Iran

3.3.1 The development of two advanced 3D Air Traffic Control (ATC) tower simulators at Zahedan (OIZH), Mehrabad (OIII) international airports and Iran Faculty is an important step in responding to the critical training needs of aviation professionals in Iran. These simulators are designed in accordance with the stringent requirements of the International Civil Aviation Organization (ICAO), particularly in training air traffic controllers to manage complex and unusual airport traffic, adapt to dynamic changes in airport infrastructure and flight instructions.

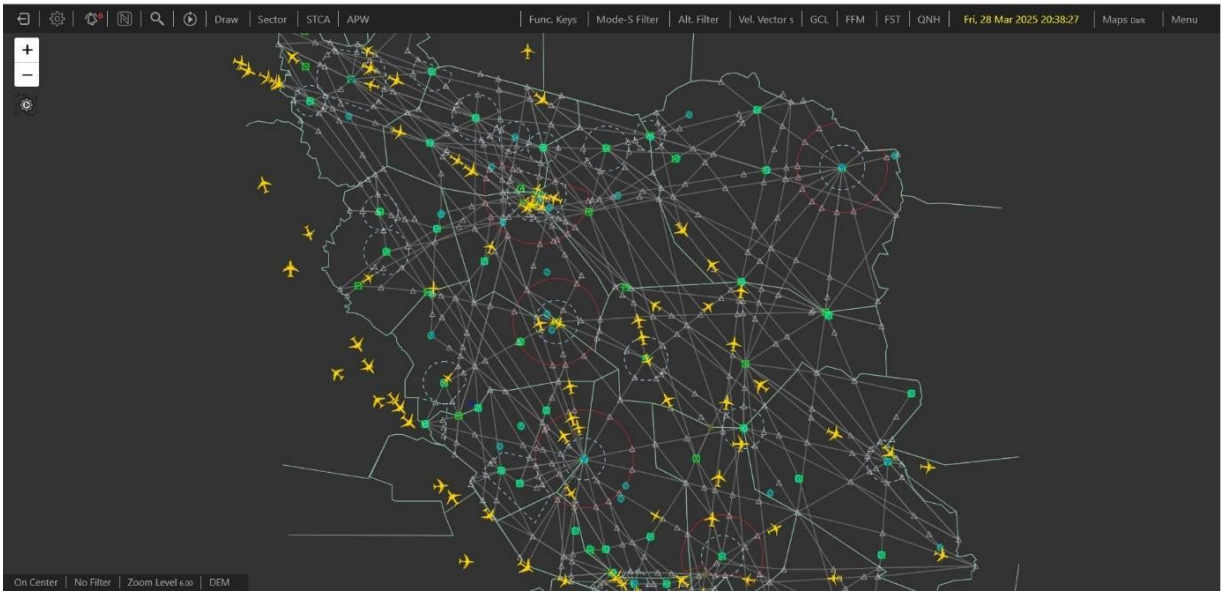
3.3.2 Iran Airports and Air Navigation Company, as the main ANS service provider in Iran, has developed an indigenous solution by leveraging domestic scientific and technological capacities. This initiative not only emphasizes our commitment to complying with ICAO safety and operational standards but also highlights the resilience of domestic innovation in overcoming shortcomings. By aligning the design of the simulators with ICAO training annexes and guidelines such as Annex 01 (Personnel Licensing) and Doc 9868 (Development of Training Programmes), we ensure that our aviation personnel, which currently number over 1,000, achieve globally recognized competency standards and provide a safe, secure and continuous service.

3.4 Development of Advanced Surveillance System (ASUR)

3.4.1 To ensure safe air traffic services and prevent disruptions, a domestically developed software called **Advanced Surveillance System (ASUR)** has been created in line with ANS requirements.

3.4.2 In airports without radar systems, those located below radar coverage, or border areas where surveillance radars deploying is neither practical nor cost-effective, alternative and low-cost surveillance systems like ADS-B offer the best solution. These systems enhance air traffic monitoring and provide better situational awareness for air traffic controllers (ATC), search and rescue centers, security agencies, and other stakeholders involved in aviation operations. Moreover, ADS-B has been identified, under ICAO GANP, as ICAO ABSU ASUR B0-1 element that supports the provision of Air Traffic Services and operational applications at reduced cost and increased surveillance coverage.

3.4.3 The ASUR alternative surveillance system is a GIS-based software infrastructure and the first system introduced by the Iran Airports and Air Navigation Company that utilizes ADS-B data for surveillance operations. In addition to leveraging the advantages of ADS-B-based systems—such as cost-effectiveness, accessibility, and high scalability—ASUR can also integrate and process data from installed radar systems across the country. This capability enables the development of a hybrid, domestically built surveillance system, contributing to the accumulation of expertise in aviation surveillance system development.



Iraq

3.5 FUA implementation Plan though Baghdad FIR (ORBB)

3.5.1 The FUA implementation plan was prepared by the ATS Dept. in the GCANS and case studies were made to explain the importance and necessity of the provision of more free airspace for civilian air traffic operations through the FIR throughout the shifting and reduction in the lateral and vertical limits of the segregated airspaces, those studies were demonstrated and given high priority especially in the areas nearing ATS routes.

3.5.2 A remarkable increase in the traffic density was noticed and continuous meetings are held to enhance the cooperation between civilian and military entities in charge of running the airspace.

3.5.3 Agreements on scheduling the airspace use for military training operations and understanding the importance of prioritizing civilian air traffic operations have led to the reduction in the risk and workload related to the co-use of airspace.

3.5.4 A daily schedule of military training is provided to the ATC operations unit and ATFM to update the ATFM Daily Plan (ADP) and to plan the flow of civilian air traffic in a safe an efficient manner.

Qatar

3.6 Approach and ACC unit

- CCO (New SIDs) TULUB 1A/LUBET 1A/ULIKA 1A New CCO SID Implementation 28 November 2024.
- Civil- Military Coordination Improvement.
- Flexible Use of Airspace (FUA) Improvements
- Qatar AIP Charts SID Initial Level Updates.
- Automation Systems Upgrades- Common Database (CDB), Flight Data Processing (FDP), Control and Monitoring System (CMS), Human Machine Interface (HMI) Improvements.
- Implementation of ATC Support Distance Base Separation Tool.
- Enhancement of Area Proximity Warning (APW) for FUA and Special Missions.
- RECAT6 Implementation.
- Enhancement of Contingency Plan to include New Qatar Air Traffic Control Center (QATCC) operations.
- Quick Reference Guidelines (Automation System and Voice Communication System) Updates for ATCOs.
- Redesignation of Missed Approach Procedures for OTHH.
- Redesignation of OTHH RNP Approaches (LNAV, LNAV/VNAV) to overlay the ILS LOC.
- Free Route Airspace (FRA) implementation.
- Digital platform implementation for Emergency/Abnormal Situations Checklists.
- Digital platform implementation for ATCOs to acknowledge operational instructions.
- QATCC – New Building. Transfer of the ACC Unit to a new building with state-of-the-art facilities.
- The seamless transition to a new building is testament to the Qatar Civil Aviation Authority (QCAA) extensive planning and commitment.
- To ensure minimal disruption, QCAA allocated comprehensive resources, including expert teams dedicated to managing logistics, equipment and communications.
- Importantly, extensive measures were implemented to mitigate any potential impact on neighboring units while ensuring the safety of the operations.
- Decrease in the number of ACC-APP related safety issues. The annual number of airspace incidents has significantly decreased, highlighting the improvements in both the performance of the Air Traffic Controllers and the overall aviation system.
- A new direct route between TOVOX and ULIKA has been implemented.
- A new route between ELIDU-SOLOB has been implemented in order to reduce the intensity of hot spots.
- Qatar implemented a shorter route for traffic departing Bahrain transiting into Kingdom of Saudi Arabia airspace to accommodate airline's requirements.
- Publication of a new APP and ACC LATCIs.
- Fast and real-time simulation of a new airspace design, to better respond to the demand of the traffic.

- Hiring and training of new or existing staff in order to be ready for the assumption of the responsibility to provide Air Traffic Services in the Northern portion of the airspace after ICAO Council decision for Doha FIR Phase 2 implementation.

3.7 Hamad Tower unit

- Electronic Flight Progress Strip (EFPS) System Update, OTBD Integration and new procedures such as SID Confidence Check.
- RRSM 24H implementation.
- RECAT 6 implementation.
- DMAN updates and advancements.
- Unit Competency Scheme (UCS) introduction.
- Introduction of Electronic Logs for instructions and digital platform for manuals etc.
- Introduction of digital seating plan database.
- New helicopter routes and procedures.
- FOD barrier installation.
- Introduction of observational flights for ATCOs.
- Additional modes of operation implemented for runway balancing.
- New equipment installation in VCR including additional PC console, vaisala and meteorological enhancements.
- New LATCI publication.
- Implementation of new LVP procedures.

3.8 Doha Tower unit

- EFPS implementation.
- RECAT 6 implementation.
- NEW VFR routes and procedures. For Fixed Wings and Rotary Wings
- New Reporting Points
- Introduction of Competency based Training and Assessment including updated Unit Training Plan (UTP). New Training Objectives
- Introduction Of Operational and Work Instructions Manuals. Radio Telephony (RT) Manual

3.9 CNS unit

- Bi-yearly routine flight checks of all navigational aids (ILS, DVOR and DME) operational at OTHH and OTBD.
- GBAS: Ionospheric data collection, analysis and feasibility study report completed.
- On-the-job training for OTHH DVOR and HP DME.
- On-the-job training for QFIR Radios for Engineering personnel.
- ATSEP basic training for new Engineering personnel.
- Familiarization Training on GNSS and argumentation system (GBAS/SBAS/ABAS).
- Decommissioning of all OTHH MMs (34L, 34R, 16L and 16R).
- Special flight check was conducted for ILS Critical and Sensitive area of RWYs 34L and 16R.
- Installed/commissioned OTHH DVOR & collocated High Power DME (as a replacement due obsolescence of old DVOR & HP DME).
- Integrated Controller Working Position (ICWP) Improvements - L5, Full Implementation will be completed by December 2025.
- L band Radar installed and commissioned for QFIR.
- Additional Radios (RX and TX) were installed for QFIR.
- EFPS delivered to support operations at OTBD and OTHH.

3.10 Communication Operations

- Upgradation of IFPS “Integrated Initial Flight Plan Processing System”, to share the 3rd Party ORMs (Operational Reply messages) with Flight Plan originator. Improvement of System functionality.
- Provision of pilot portal for airlines operator to file flight plan.

- Online platform (Web based) for Qatar Landing and Overfly permission. Implementation status: Testing phase.

3.11 AIM Unit

- Design and develop New SID CCO at OTHH.
- Design and develop New RNP instrument approach procedure.
- Revision of OTHH ILS Circling Minima.
- Revision of OTHH RWY 16L Intermediate MOCA.
- Modification of OTHH ILS missed approach procedure.
- Design and develop five (5) new STARs at OTHH
- Revision of fifteen (15) STARs at OTHH due to the new STAR procedures.

3.12 ATFM Unit

- Contacts on improvements and flight planning with Major Airline Operator.
- Doha AIM involvement in ATFM for the access of PFIB & updates of publications were established.
- Doha Communications involvement in ATFM was established.
- Training for all ACC controllers in ATFM Tool installed in ACC.
- Metron Aviation software provider & Doha ATFM follow up meetings and improvements, adaptations, and new software releases.
- Developed ATFM Daily Plan (ADP) and CDM contacts specifically with Kingdom of Saudi Arabia and UAE.
- ATFM Audit certification conducted by QCAA ANSI.
- Providing OTHH TWR with predicted Runway fix balancing information for three peak departure periods.
- Runway SID Balancing since 27th October 2024 Winter Schedule.

3.13 QMET

- Full implementation of Meteorological Watch Office (MWO) in OTHH.
- Installation & full operation of LIDAR for wind shear detection in OTHH.
- Successful conduction of QCAA Air Safety Department's audit on Meteorological Services.
- Development & Full Operation of Operational Webpage for Aeronautical Meteorological Services.

Saudi Arabia

3.14 Development of plan to enhance the Airport and TMA operations - Airport CDM (A-CDM)

3.14.1 Concept of Operation (CONOPS)

3.14.1.1 Airport Collaborative Decision Making (A-CDM) is a set of processes aimed at improving air traffic management through a greater exchange of information between all stakeholders (airport operators, ground handling agents, airlines, air traffic controllers, etc.).

3.14.1.2 The implementation of A-CDM represents a significant enhancement in airport operations. A-CDM aims to improve the efficiency, predictability, and resilience of airport operations by optimizing resource utilization and parking area utilization, departure sequencing, and minimizing ground delays and fuel consumption. Furthermore, it is also beneficial for the environment and reduces the workload of air traffic controllers.

3.14.1.3 With the rise of digital technologies and the Internet of Things (IoT), the future of A-CDM will involve more intricate data integration. Machine learning and AI will be used to predict operational disruptions and offer mitigation strategies. Moreover, as airports grow and the airspace becomes more congested, the principles of ACDM will be increasingly adopted regionally, ensuring a harmonized approach not just at individual airports, but across entire regions or airspaces.

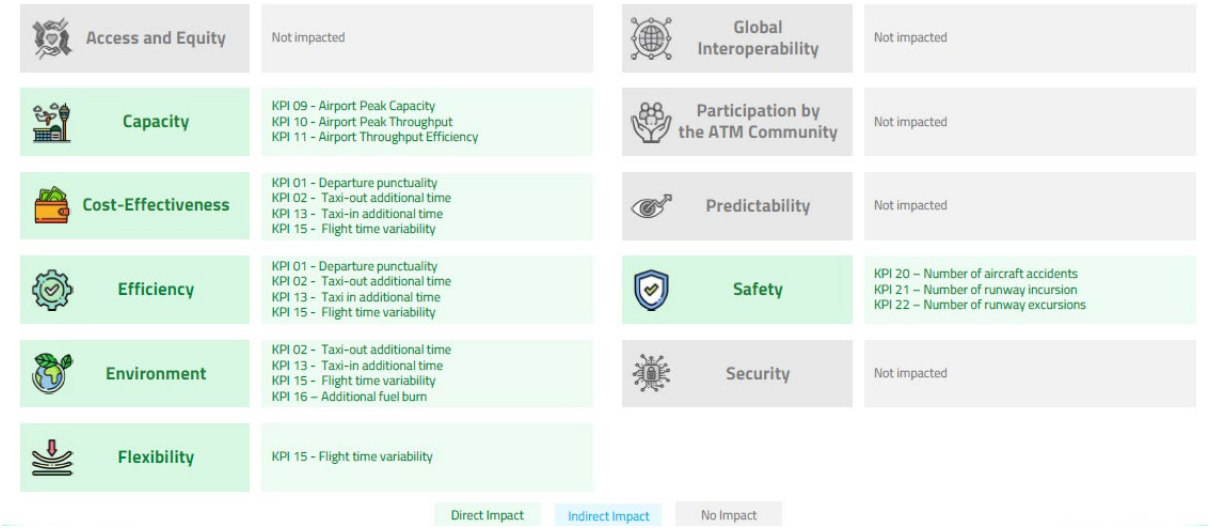
3.14.2 The A-CDM implementation Strategy in KSA will follow a stepwise approach:

- *Pilot Implementation:* Pilot projects for A-CDM are already foreseen under SFAC Programme in Riyadh and Jeddah international airports, under Seamless Operations Programme and at Yenbo airport (OEYN).
- *Integration of Systems and Stakeholders:* Develop an integrated platform that collates and distributes planning, flight progress information, and event predictions among all airport stakeholders.
- *Training and Awareness:* Conduct extensive training and awareness programs for all involved parties to understand the benefits and functionalities of A-CDM.
- *Continuous Monitoring and Feedback:* Implement mechanisms for continuous monitoring and feedback to ensure the system's adaptability

3.14.3 Operational Improvement Steps (OIS) Solution

- Improved Operations in Adverse Conditions through Airport Collaborative Decision Making.
- Improved Turn-Round Process through Collaborative Decision Making.
- Collaborative Pre-departure Sequencing.
- Basic Departure Management (Pre-departure Management).
- Collaborative Airport Planning Interface (AOP fully integrated with NOP & local business rules).
- A-CDM Process Enhanced through Integration of Landside (passenger and baggage) Process Outputs.
- Consolidation and facilitation of Target Times between local ATFM, Airport CDM and Extended Arrival Management.
- Improved De-icing Operation through Collaborative Decision Making (if and where applicable)

3.14.4 Operational Performance Measures



3.14.5 ASBU mapping with main architectural elements

ASBU THREAD	Element ID	ASBU Elements
ACDM	B0/1	Airport CDM Information Sharing (ACIS)
	B0/2	Integration with ATM Network function
	B1/1	Airport Operations Plan (AOP)
	B1/2	Airport Operations Centre (APOC)
	B2/3	Total Airport Management (TAM)
	B3/1	Full integration of ACDM and TAM in TBO
NOPS	B0/4	Initial Airport/ATFM slots and A-CDM Network Interface

3.15 Development of plan to Enhance the Airport and TMA operations - Advanced Surface Movement Guidance and Control System (A-SMGCS)

3.15.1 Concept of Operation (CONOPS)

3.15.1.1 Advanced Surface Movement Guidance and Control Systems (A-SMGCS) is a combination of visual and non-visual aids, procedures and tools for aerodrome's surface movement monitoring and control. It enhances situational awareness and airport capacity, ensuring a high level of safety and making ground operations more efficient in all weather conditions. The basic A-SMGCS consists of a surveillance service that provides the position, identification and tracking of mobiles.

3.15.1.2 The A-SMGCS system can include additional features, such as:

- Airport Safety Support Service: Runway Monitoring and Conflict Alerting (RMCA), Conflicting Air Traffic Control Clearances (CATC) alerts, Conformance Monitoring Alerts for Controllers (CMAC);
- Routing service generation and management of surface trajectories for aircraft and vehicles;
- Guidance service, automated switching of taxiway centreline lights (TCL), automated switching of stop bars and automated activation of advanced-visual docking guidance systems (A-VDGS).

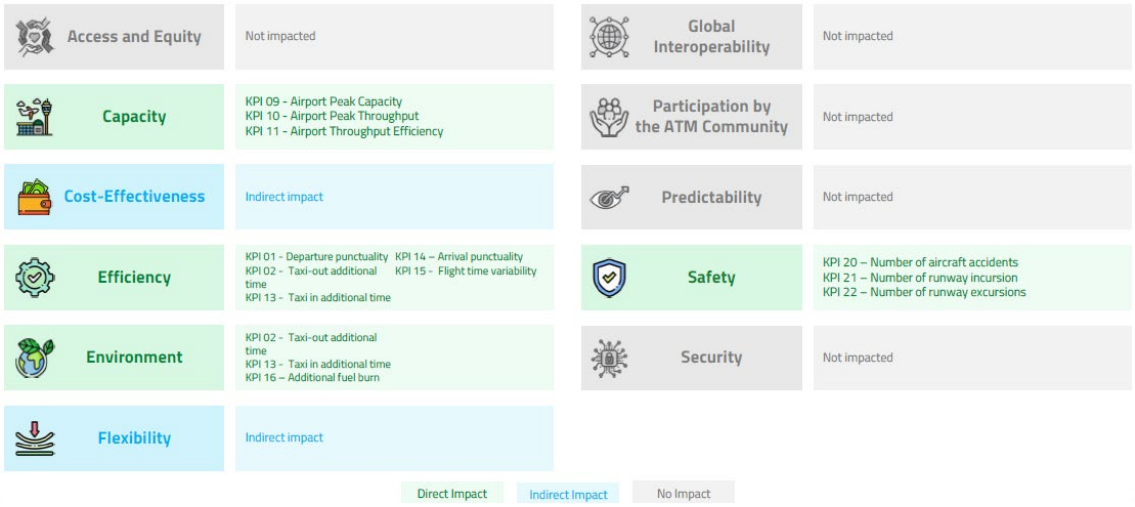
3.15.1.3 To the benefit of controllers, the A-SMGCS provides:

- a representation of the actual aerodrome traffic on a display, independent of line-of-sight connection between the controller and the mobile;
- the position and identity of all cooperative mobiles, within the coverage volume independently of visibility conditions and the controller's line of sight;
- support to prevent collisions between all aircraft and vehicles, especially in conditions when visual contact cannot be maintained;
- detection and indication of the position of potential intruders;
- improved all-round management of traffic.

3.15.2 Operational Improvement Steps (OIS) Solution

- Airport Safety Nets for Controllers at A-SMGCS Airports.
- Ground Controller Situational Awareness in all Weather Conditions.
- Enhanced Ground Controller Situational Awareness in all Weather Conditions with ADS-B.
- Automated Alerting of Controller in Case of Runway Incursion or Intrusion into Restricted Areas.
- Automated Assistance to Controller for Surface Movement Planning and Routing
- Airport Safety Net for Vehicle Drivers.
- Airport Vehicle Driver's Traffic Situational Awareness.
- Enhanced Guidance Assistance to mobiles based on the automated switching of Taxiway lights and Stop bars
- according to the 'Airfield Ground Lighting'.
- Enhanced Runway Usage Awareness
- Improved Airport Safety with Better Prevention of Runway Excursions for Tower Controllers.
- Airport Safety Nets for Controllers at Secondary Airports.
- Enhanced safety in LVP through use of virtual block control.
- Extended Airport Safety Nets for Controllers at A-SMGCS Airports.
- Conflict Resolution for Tower Controllers.
- Airport Safety Enhanced by Prediction and by Detection of Adverse Traffic Patterns based on Ground Surveillance.
- Equivalent Visual Landing operations in Low Visibility Conditions with Head Mounted Display.
- Equivalent Visual Taxi operations in Low Visibility Conditions.
- Conformance Monitoring Safety Nets for Pilots.
- Traffic Alerts for Pilots during Runway and Taxiway Operations.
- Enhanced Runway Condition Awareness.
- Improved Safety with Better Prevention of Runway Excursions for Pilots.
- Datalink Services used for Provision of Ground-related Clearances and Information for trajectory-based operations.
- Guidance Assistance to Aircraft on the Airport Surface Combined with Routing for trajectory-based operations.

3.15.3 Operational Performance Measures



3.15.4 ASBU mapping with main architectural elements

ASBU THREAD	Element ID	ASBU Elements
SURF	B0/1	Basic ATCO tools to manage traffic during ground operations
	B0/2	Comprehensive situational awareness of surface operations
	B0/3	Initial ATCO alerting service for surface operations
	B1/1	Advanced features using visual aids to support traffic management during ground operations
	B1/2	Comprehensive pilot situational awareness on the airport surface
	B1/3	Enhanced ATCO alerting service for surface operations
	B1/4	Routing service to support ATCO surface operations management
	B1/5	Enhanced vision systems for taxi operations
	B2/1	Enhanced surface guidance for pilots and vehicle drivers
	B2/2	Comprehensive vehicle driver situational awareness on the airport surface
	B2/3	Conflict alerting for pilots for runway operations
	B3/1	Optimization of surface traffic management in complex situations

ASBU THREAD	Element ID	ASBU Elements
ASUR	B0/1	Automatic Dependent Surveillance – Broadcast (ADS-B)
	B0/2	Multilateration cooperative surveillance systems (MLAT)
	B0/3	Cooperative Surveillance Radar Downlink of Aircraft Parameters (SSR-DAPS)

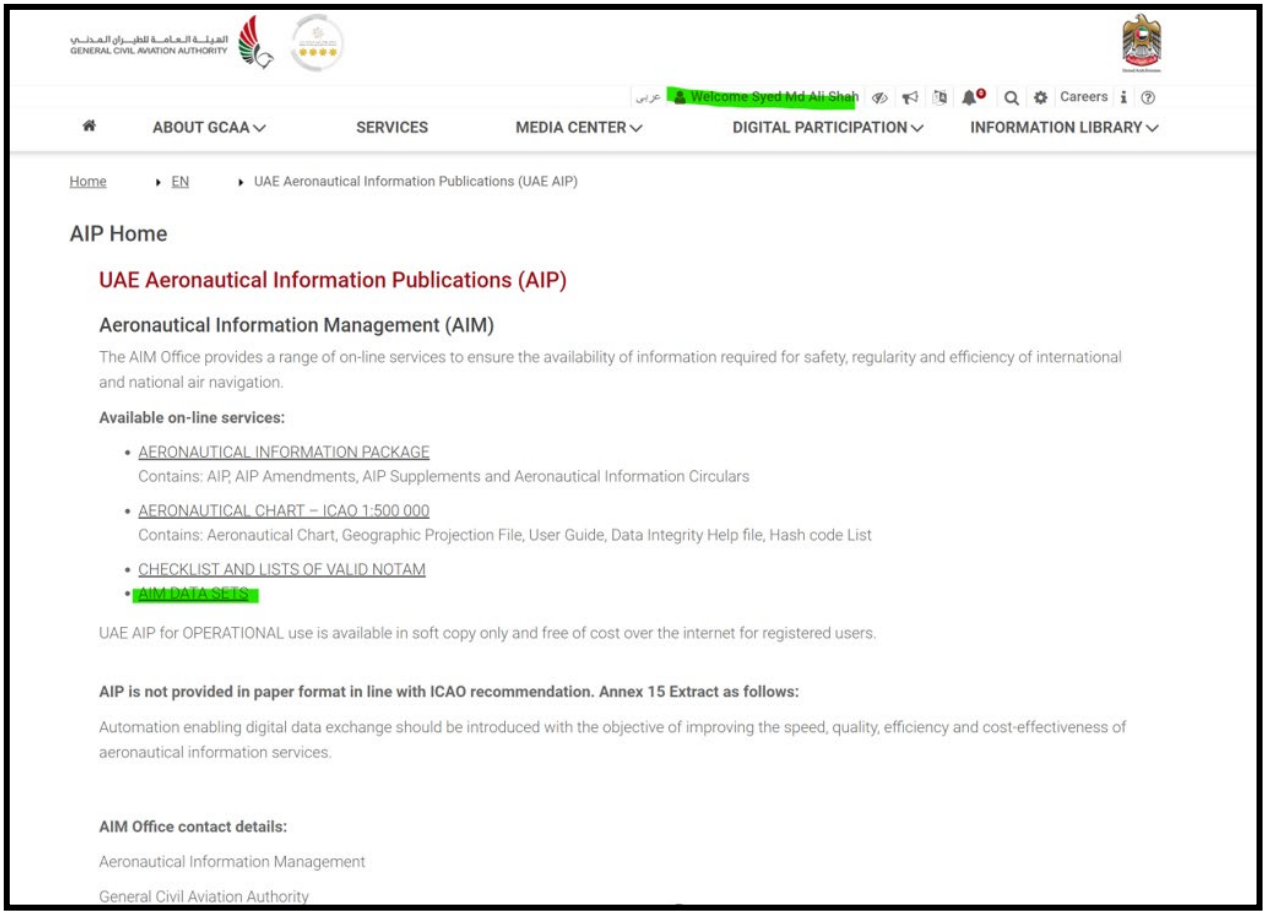
UAE

3.16 AIM - Automation of eTOD Data Area 1 and AIP Datasets Provision

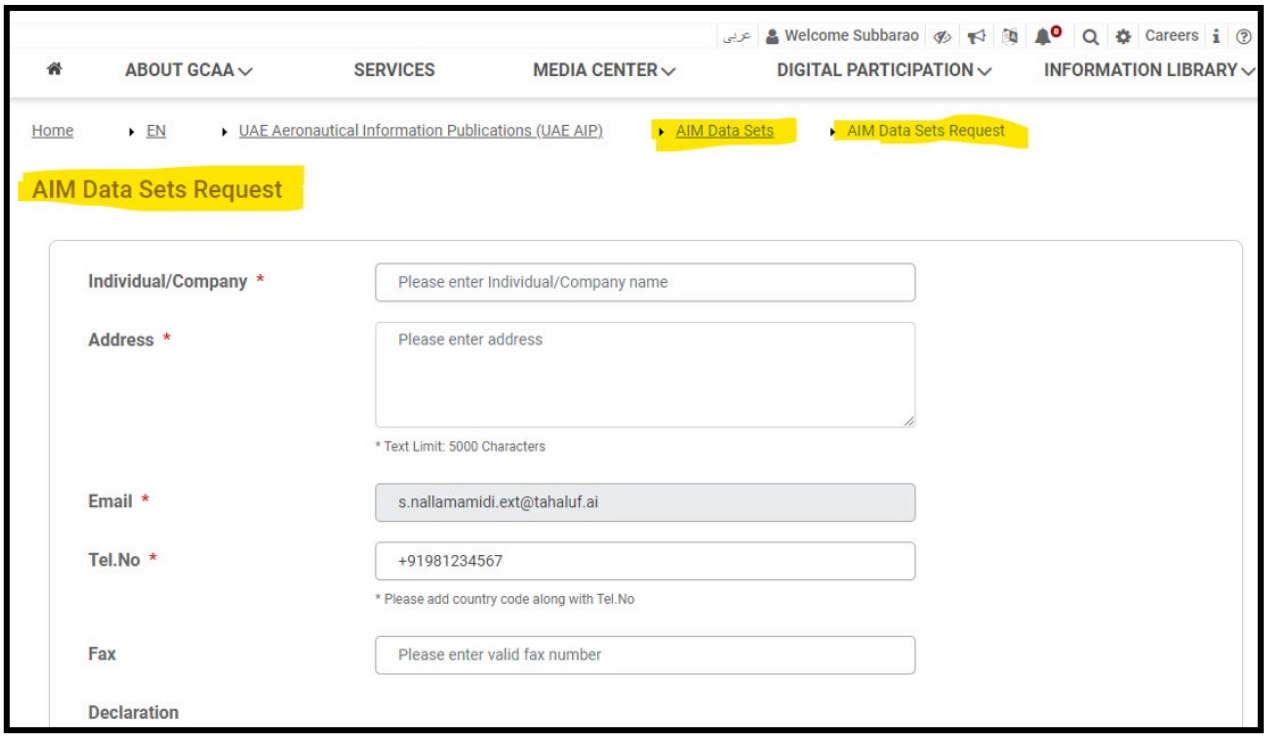
3.16.1 UAE GCAA AIM is delivering UAE ETOD Area 1 Datasets in industry standard exchange format i.e. AIXM 5.1. The Dataset is delivered in line with UAE Local Regulations and ICAO SARP's Annex 15, Doc. 10066 and Doc. 9881.

3.16.2 To acquire the data the customers had to fill and sign a Self-Declaration form in PDF format. In line with UAE GCAA Strategic Objectives for continuous improvement to Air Navigation Services, the form is replaced with an online HTML check box making it a one-click self-service.

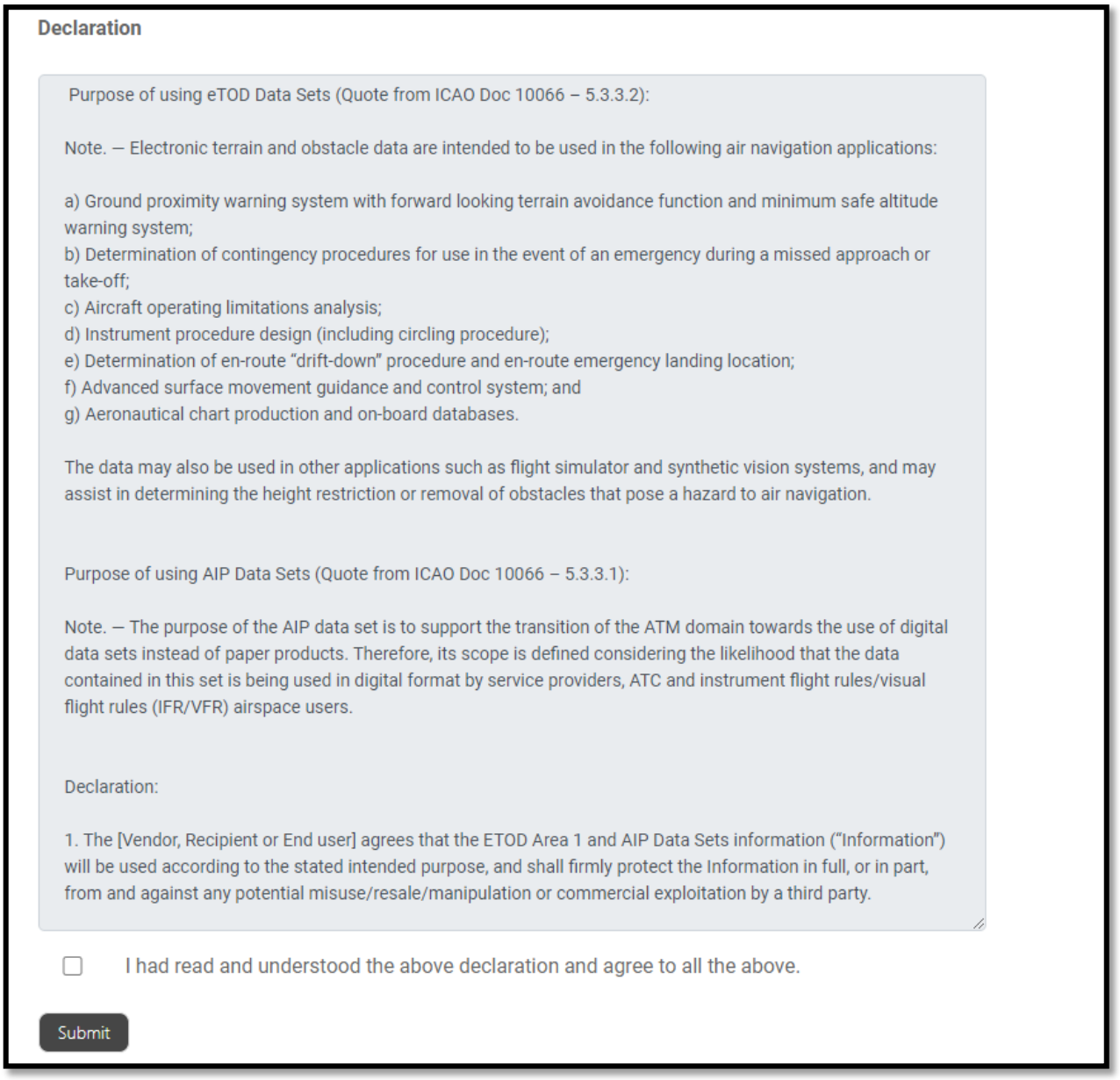
3.16.3 The online service has been expanded to include AIP Datasets as well. Screenshots of the enhancements are shown below:



AIM DATA SETS (included ETOD Area1 and AIP Datasets)



Details that can be filled online for requesting the service

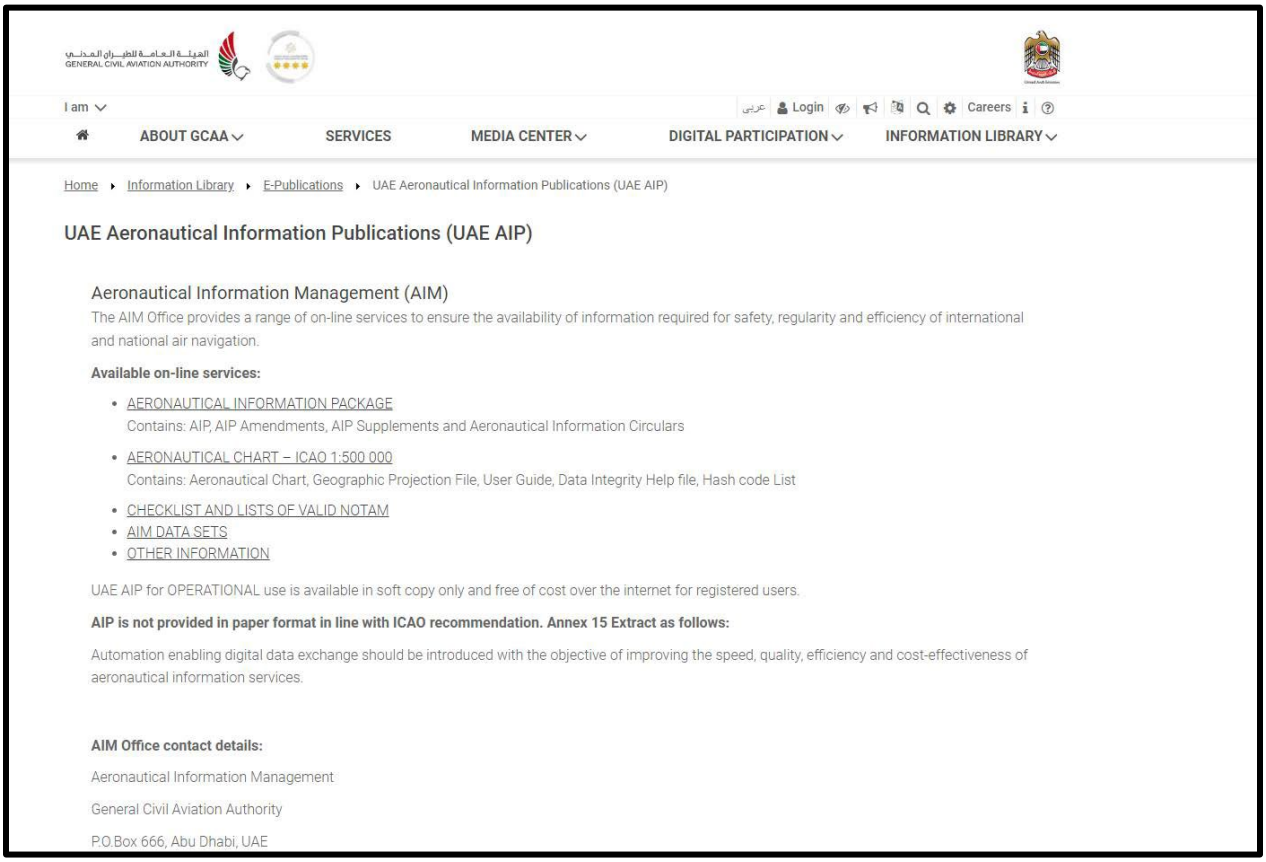


Replace with a one click HTML Web form

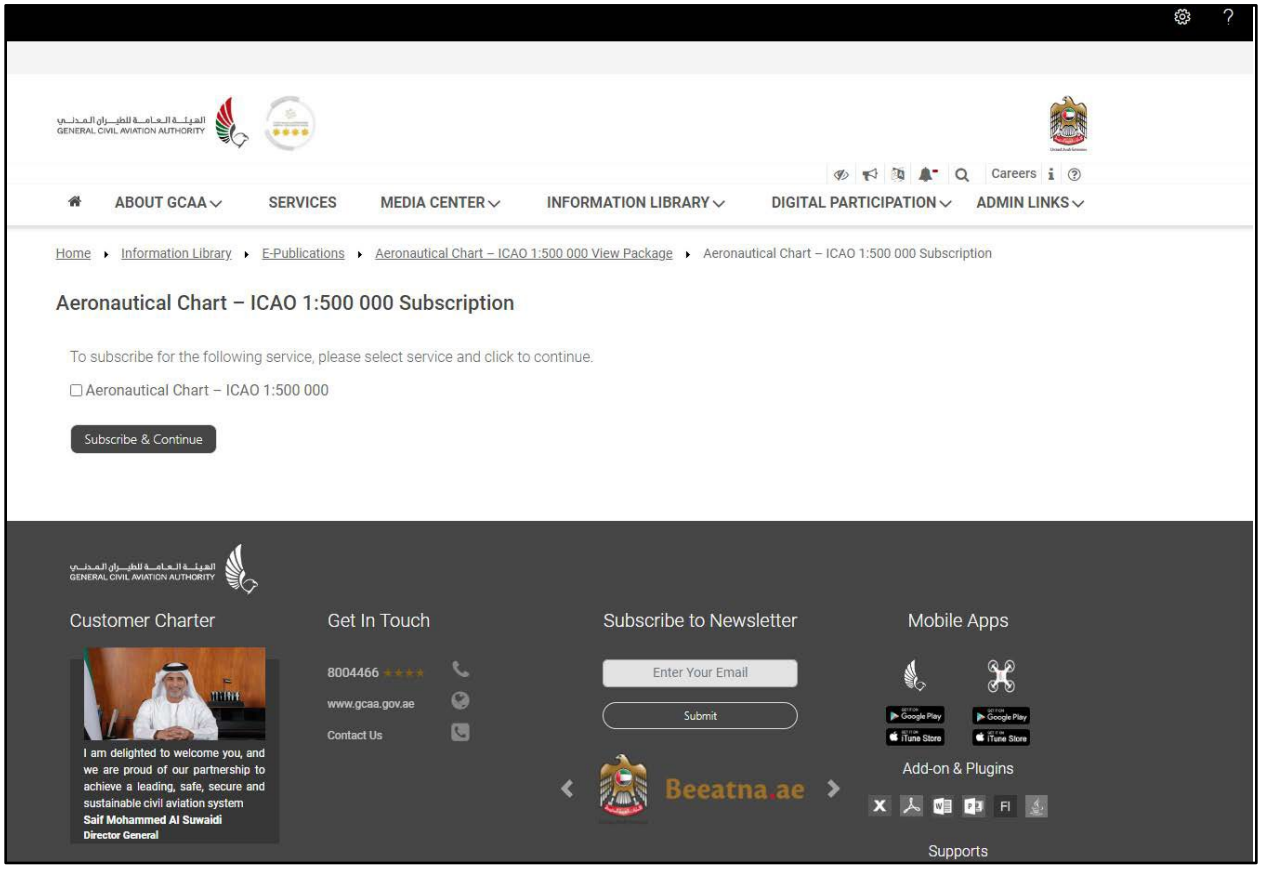
3.17 AIM - Provision of Aeronautical Chart ICAO – 1:500 000 Online

3.17.1 UAE GCAA AIM is delivering Aeronautical Chart ICAO – 1:500 000 in line with UAE Local Regulations and ICAO SARP's Annex 15, Doc. 8697. Aeronautical Chart was previously provided to customers in hard and soft copy only after filling a PDF request form.

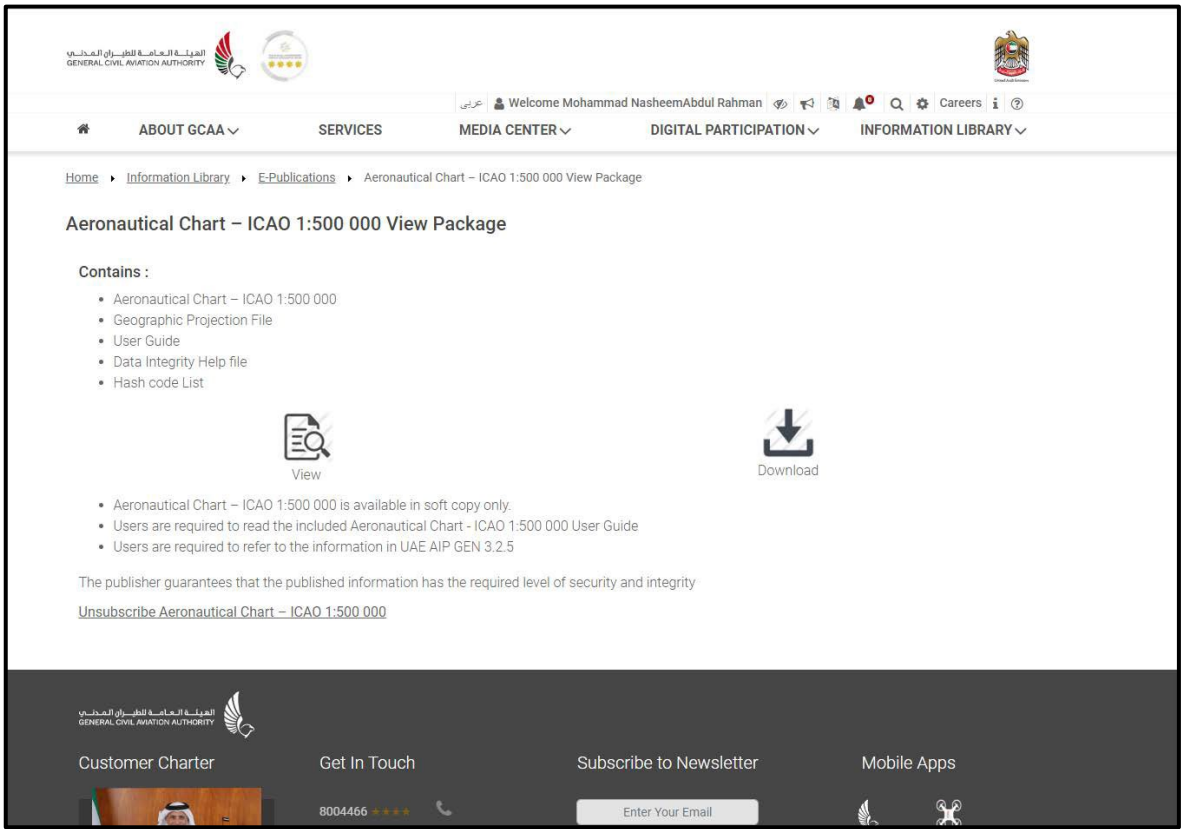
3.17.2 In line with UAE GCAA Strategic Objectives for continuous improvement to Air Navigation Services, UAE GCAA AIM has eliminated this manual process by delivering the chart in Electronic Format online free of cost to customers as a self-service.



Aeronautical Chart ICAO – 1:500 000 Online interface



Aeronautical Chart ICAO – 1:500 000 online subscription

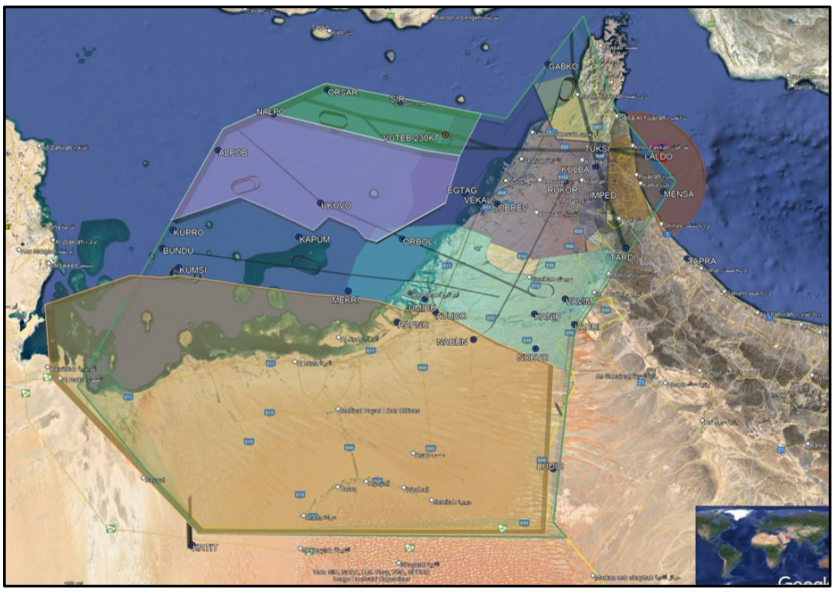


Aeronautical Chart ICAO – 1:500 000 Online view or download

3.18 ATM - UAE Airspace 3D Visualization Using Google Earth Pro

3.18.1 The UAE Airspace 3D Visualization is a diversified solution developed by the ATM team in the GCAA to improve airspace visualization with 3D capability. This tool offers a comprehensive, interactive representation of the Emirates FIR, empowering users to explore and analyze complex airspace data with precision and clarity.

3.18.2 By visualizing key elements of the Emirates FIR, the tool provides critical support for decision-making, operational planning, and stakeholder collaboration. The tool integrates detailed spatial data to present an intuitive and accessible 3D environment, addressing the needs of airspace planning, analyzing, and research.



Benefits:

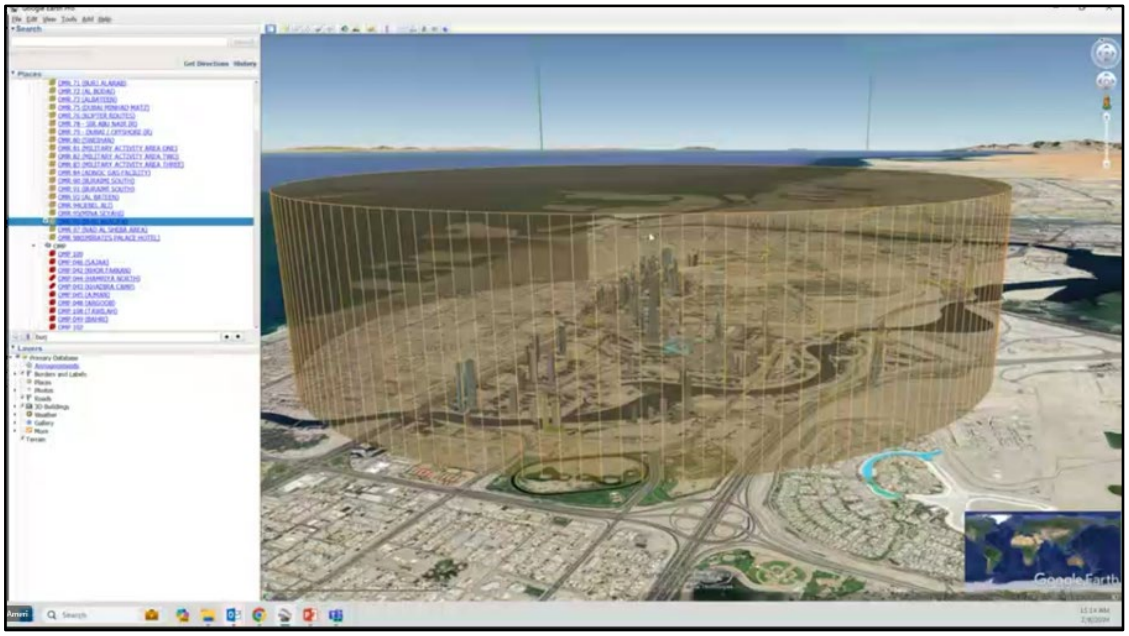
- Comprehensive 3D visualization of the UAE airspace.
- User-friendly interface for seamless interaction and analysis.

Coverage Details:

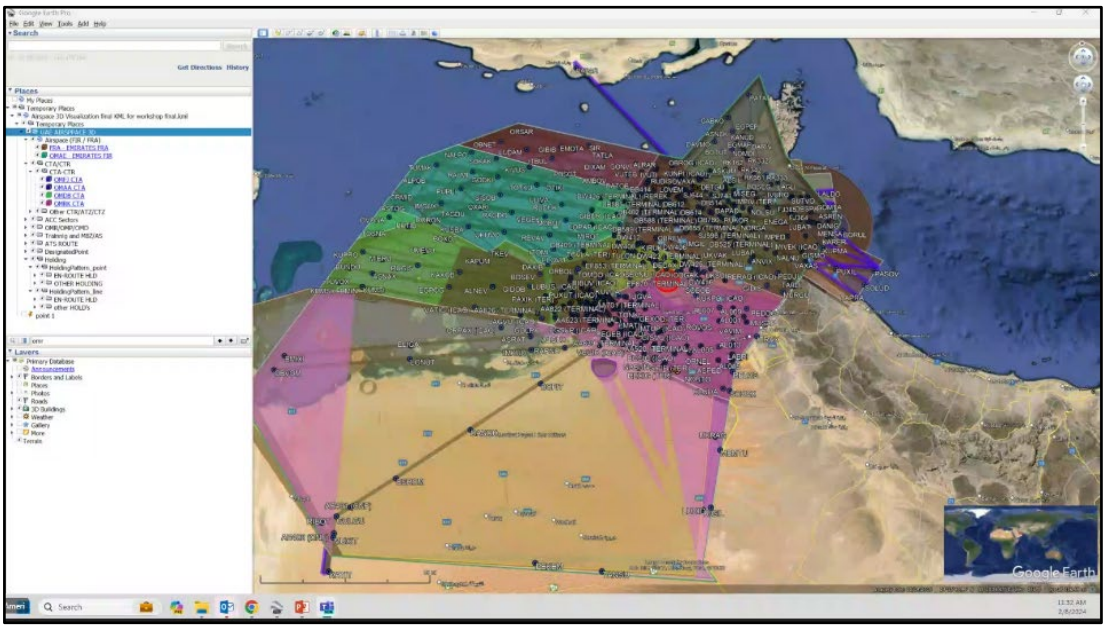
- Includes restricted, prohibited, dangerous, and training areas.
- Visualizes controlled traffic areas (CTAs) and military zones.
- Displays ICAO-designated names alongside local titles.

Additional Data:

- Provides heights and coordinates for key locations.
- Enables users to locate ICAO-designated points with ease.
- Facilitates navigation to terminal areas and airways.

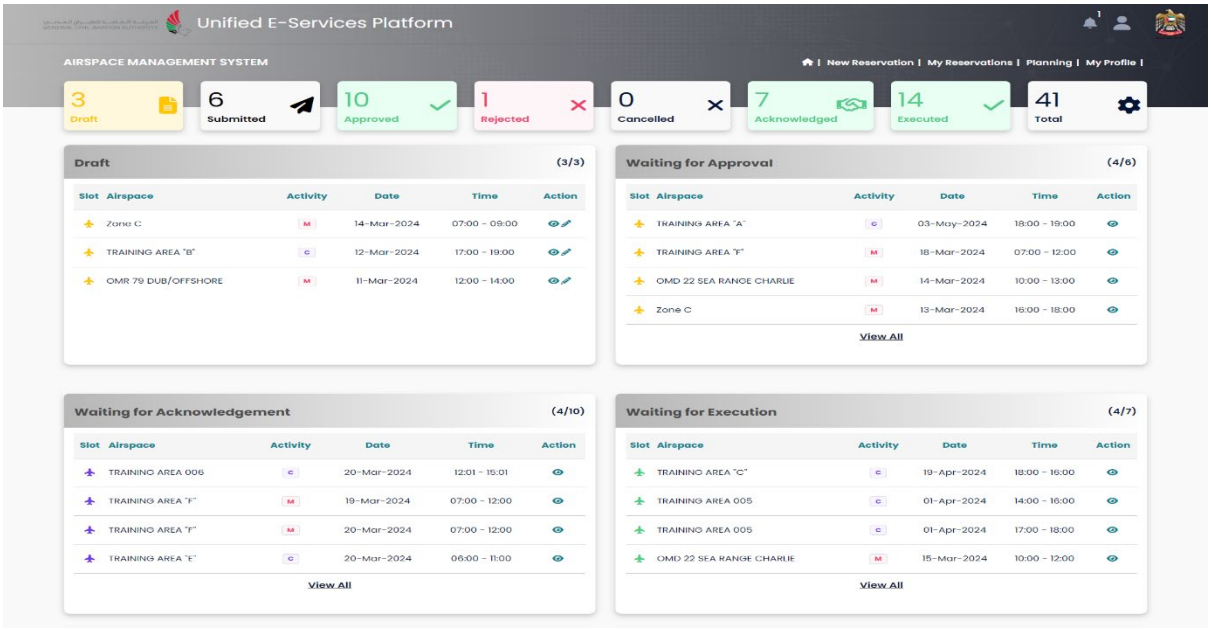


3.18.3 The UAE Airspace 3D Visualization has been instrumental in supporting strategic airspace planning, acts as one-stop shop for airspace volumes, and provides graphical data to be used in diversified practices. By simplifying complex airspace structures and providing detailed insights, the project has set an improved method in airspace management, aligning with the UAE's vision for innovative approaches in the work environment.

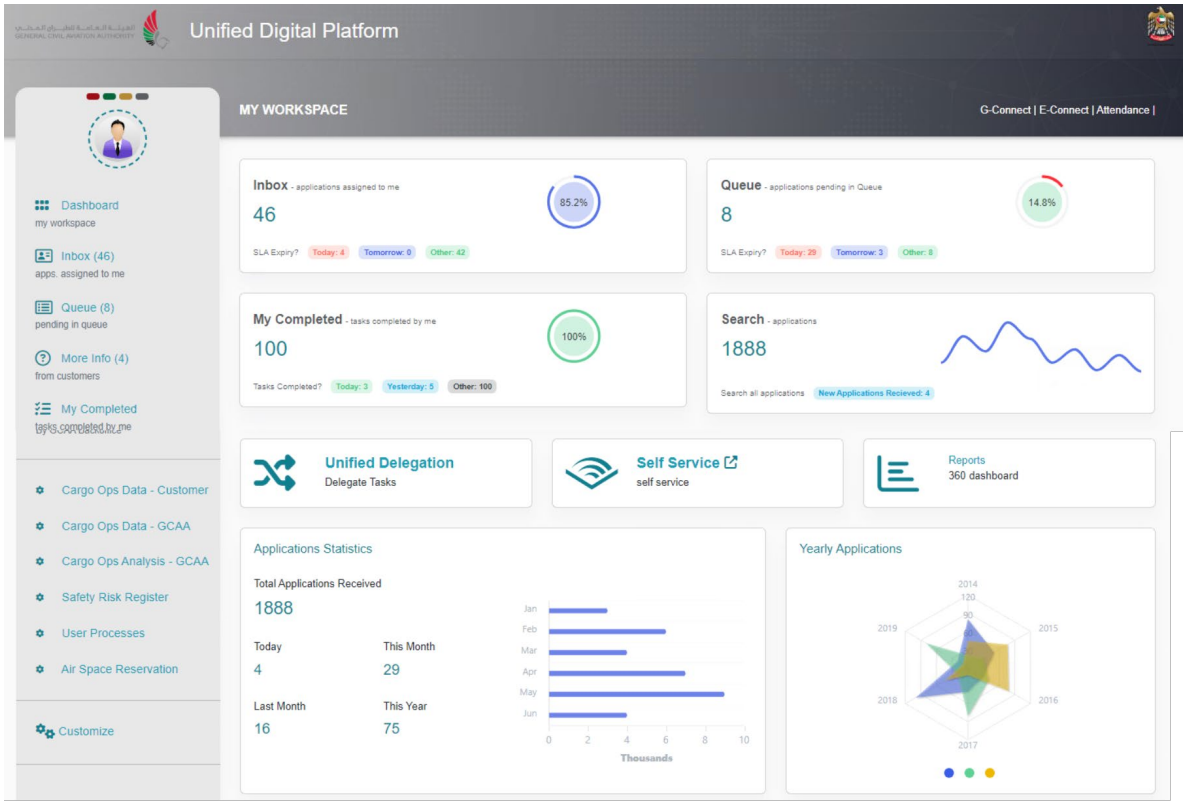


3.19 ATM - Airspace Reservation System

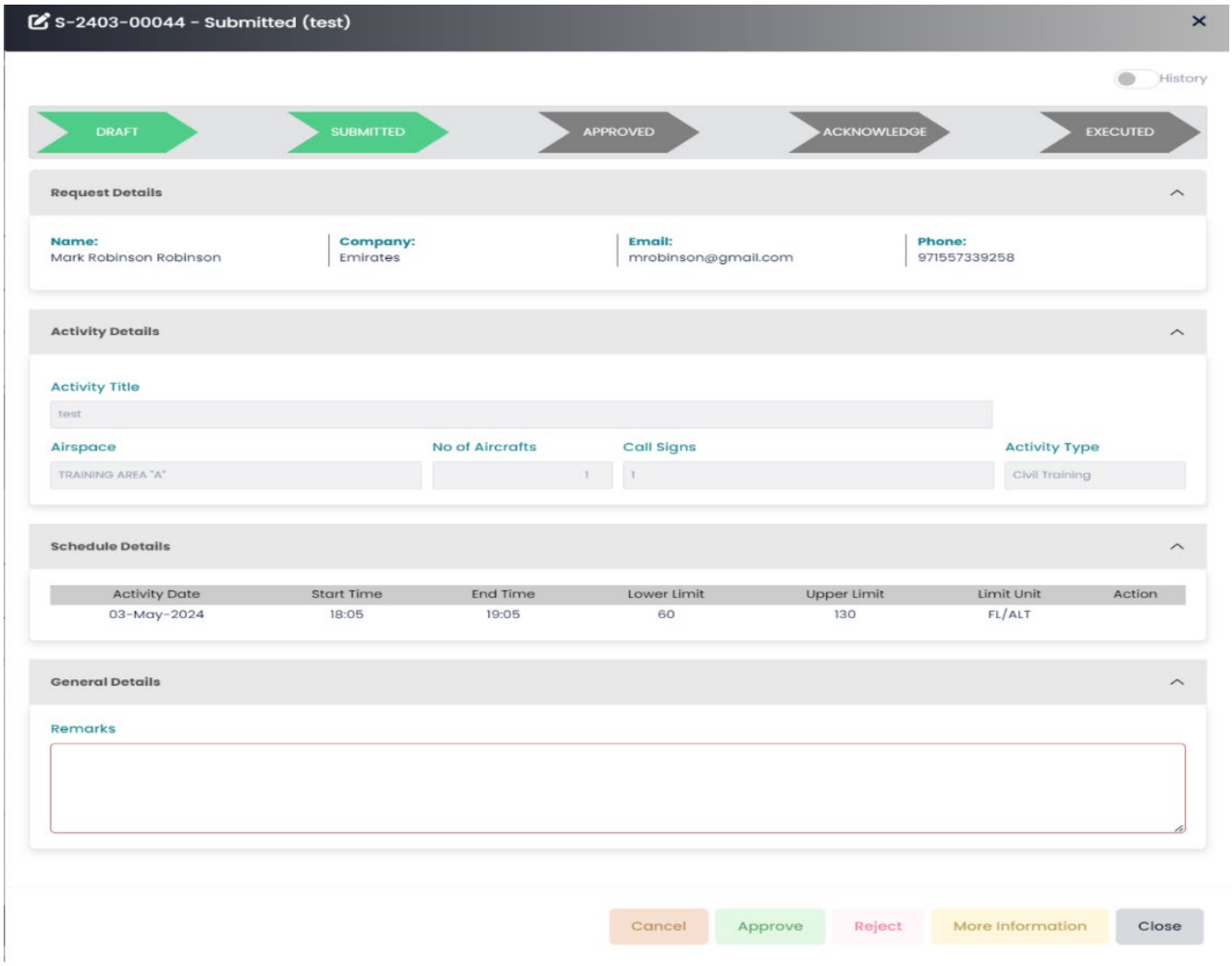
3.19.1 The newly developed airspace reservation system, created in-house by the GCAA, represents a significant technological achievement aimed at streamlining the process of reserving airspace training zones. This system, which is available to national operators and both civilian and military flight training academies, supports airspace management in line with the concept of Flexible Use of Airspace (FUA).



3.19.2 The system allows users from various entities to submit reservation requests for training areas with a high level of transparency. By providing advanced technical information, it enhances the user experience and simplifies the process.



3.19.3 Developed using internal capabilities and resources, the system aims to proactively address the needs of the airspace users, improving the efficiency of airspace planning. As a result, it's expected to reduce unexpected airspace volume requests to 0% and achieve a 100% in digital transformation of the process.



3.19.4 This achievement is a clear example of the GCAA's commitment to innovation, contributing to more efficient and transparent airspace management, and improving operational performance in the aviation sector.

3.20 ATM - RLAT – Reduced Lateral Separation

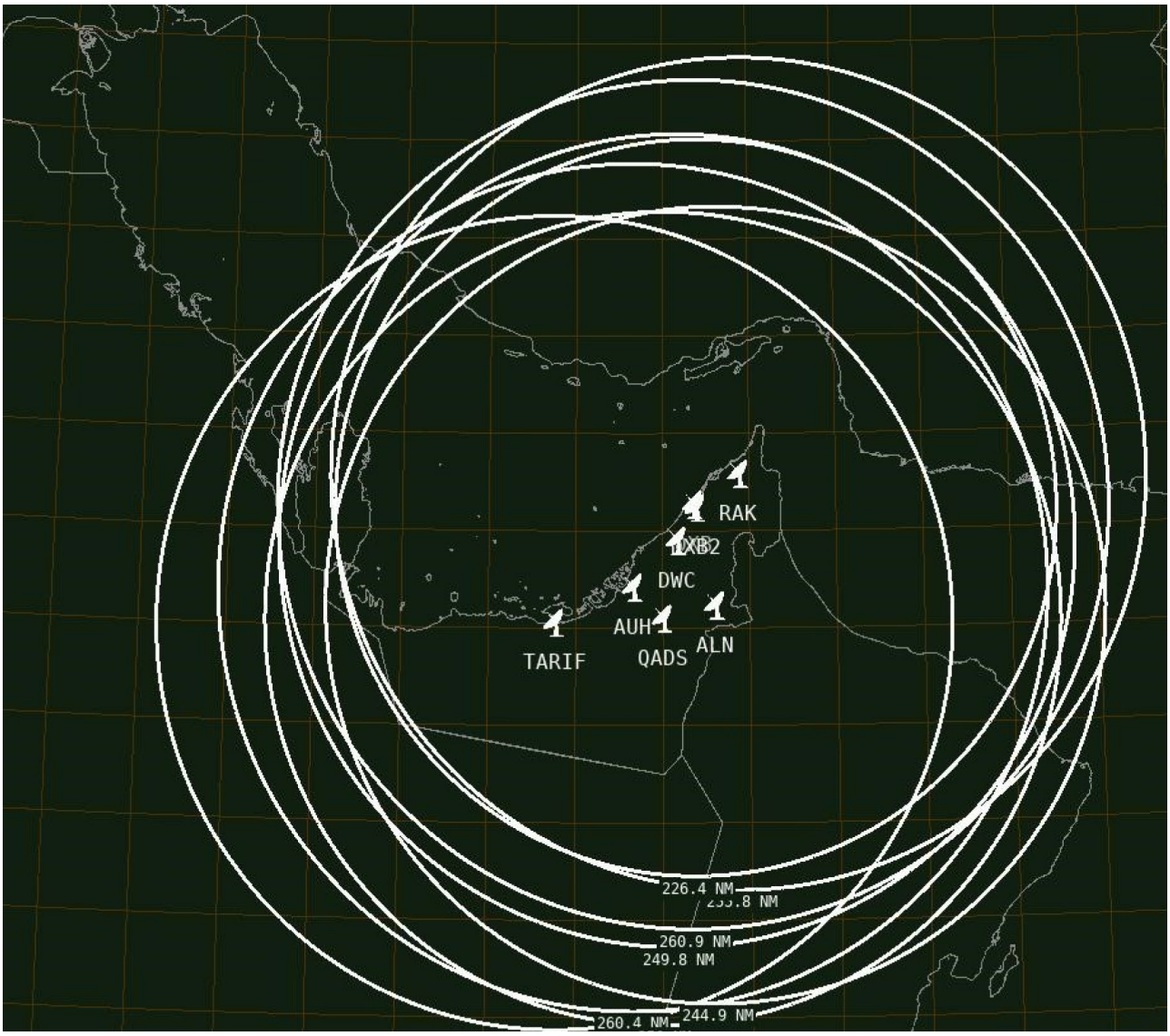
3.20.1 Emirates ACC has implemented Reduced Lateral Separation, or RLAT, below FL195 within Emirates FIR, reducing the lateral surveillance separation minima has reduced from 5 NM to 3 NM.

3.20.2 The current phase of RLAT implementation facilitates the ATCOs using 3 NM surveillance separation on a tactical basis, while the next phase will enable capacity enhancements.

3.20.3 RLAT paves the way for significant capacity and efficiency enhancements within Emirates FIR. These advancements will enable the handling of a greater number of aircraft within the FIR, reducing congestion and minimizing delays. Additionally, by optimizing flight paths and improving air traffic flow, CO2 emissions can be lowered, contributing to a more sustainable aviation industry.

3.20.4 RLAT implementation is a crucial step towards meeting the General Civil Aviation Authority's vision of creating a safe, competitive, and sustainable civil aviation system. Commitment to safety remains a top priority, and with RLAT, GCAA is maintaining the highest safety standards while embracing technological advancements.

3.20.5 Being the first in the region to introduce RLAT in area control, Emirates ACC is proud to lead the way in aviation innovation. We believe this will not only benefit our operations but also set a new benchmark for air traffic management in the region.



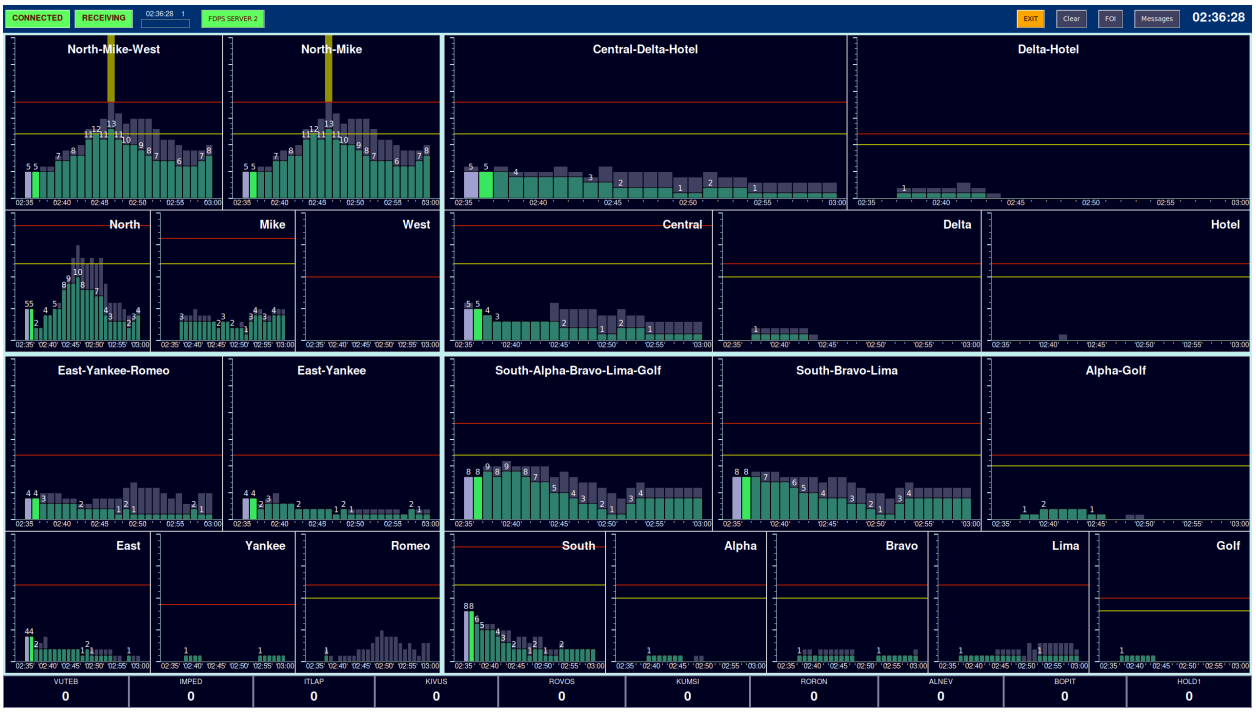
3.21 ATM - TRAMON

3.21.1 TRAMON is traffic capacity monitoring system develop to aid operational supervisors in their decision making. TRAMON provides information on the exact number of aircraft currently under the control of each sector volume, and a short-term prediction for the expected demand for each sector. Information is presented in a graphical and intuitive manner.

3.21.2 TRAMON displays historic, actual and predicted demand in relation to simultaneous occupancy within each sector and combination of sectors. Demand is displayed by bar charts in one-minute intervals, and updated in real time. TRAMON presents colour coded alerts when capacity limits for sector volumes are met or exceeded, both in real time, and forecasted demand.

3.21.3 TRAMON also displays the actual number of aircraft currently in any of the enroute holds within the FIR.

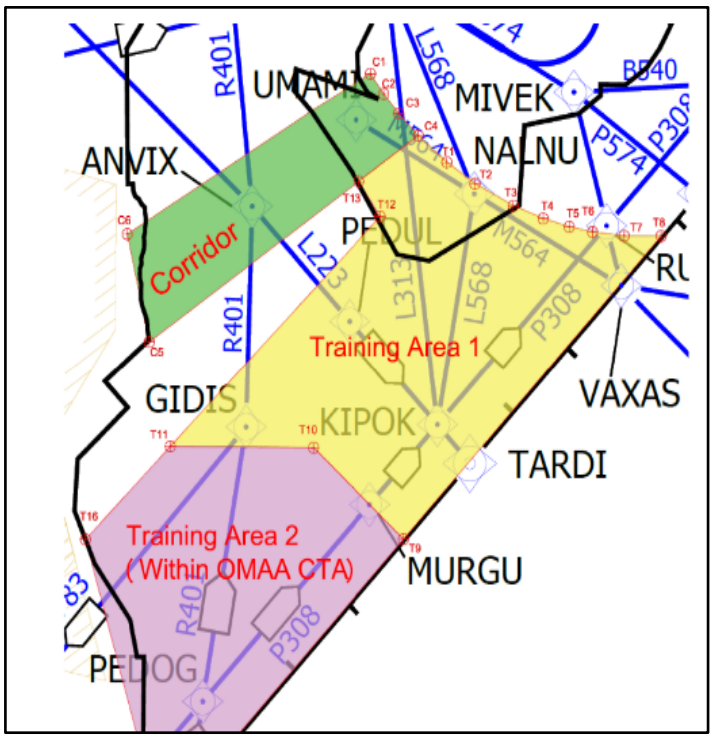
3.21.4 TRAMON enables efficient resource utilization by dynamic opening and combining of ACC sectors.



UAE & Oman

3.22 ATM - Enhancing Regional Airspace Management and Reopening Training Areas for Aviation Training Academies

3.22.1 In a landmark achievement reflecting the spirit of regional collaboration, the UAE and Oman successfully enhanced airspace management and reopened critical training areas to support aviation training academies. This initiative aligns with the shared commitment of both states to uphold the principles of seamless and efficient airspace use, as advocated by the ICAO.

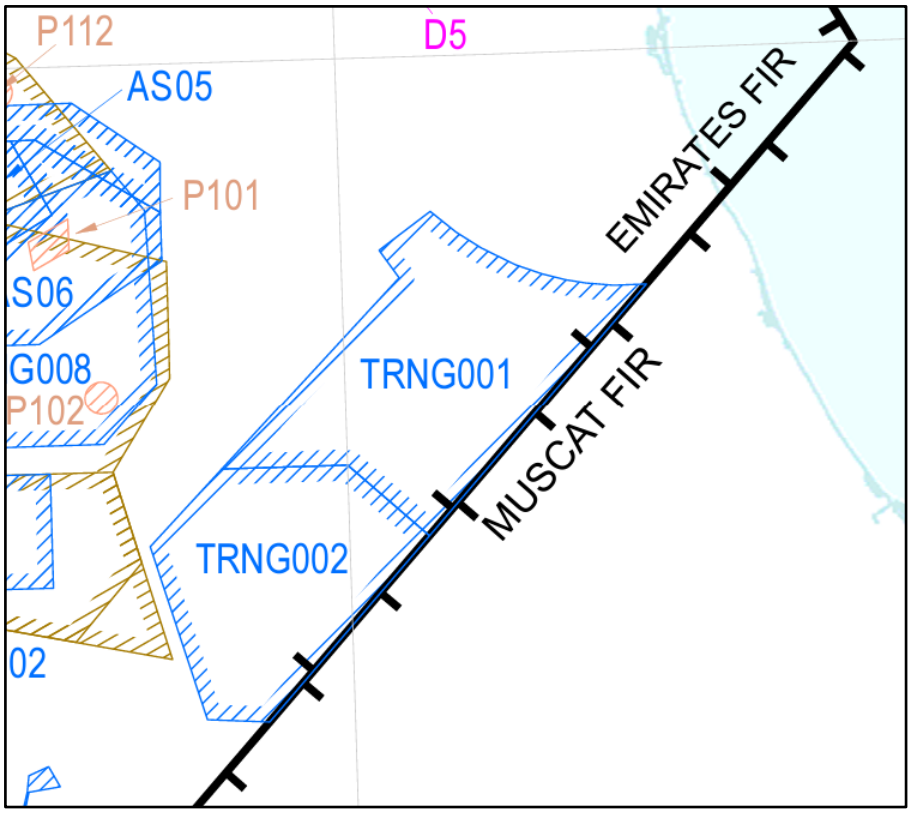


3.22.2 Addressing the Need for Optimized Airspace

3.22.2.1 With the growing demand for skilled aviation professionals, the availability of dedicated training areas has become increasingly vital. However, airspace complexities and competing demands for its use posed challenges to sustaining adequate access for training purposes. Recognizing this, the UAE and Oman embarked on a collaborative effort to resolve these issues, ensuring the safe and efficient use of airspace while supporting the growth of the aviation industry.

3.22.2.2 Key challenges included:

- **Congested Airspace**: The shared airspace faced increasing congestion due to escalating operational demands and limited areas for non-commercial use.
- **Operational Efficiency**: The need to optimize traffic flow while maintaining access for training operations in a manner consistent with both states provisions for safety and efficiency.
- **Economic and Educational Impact**: The lack of suitable training zones risked slowing the development of aviation professionals essential to supporting future industry growth.

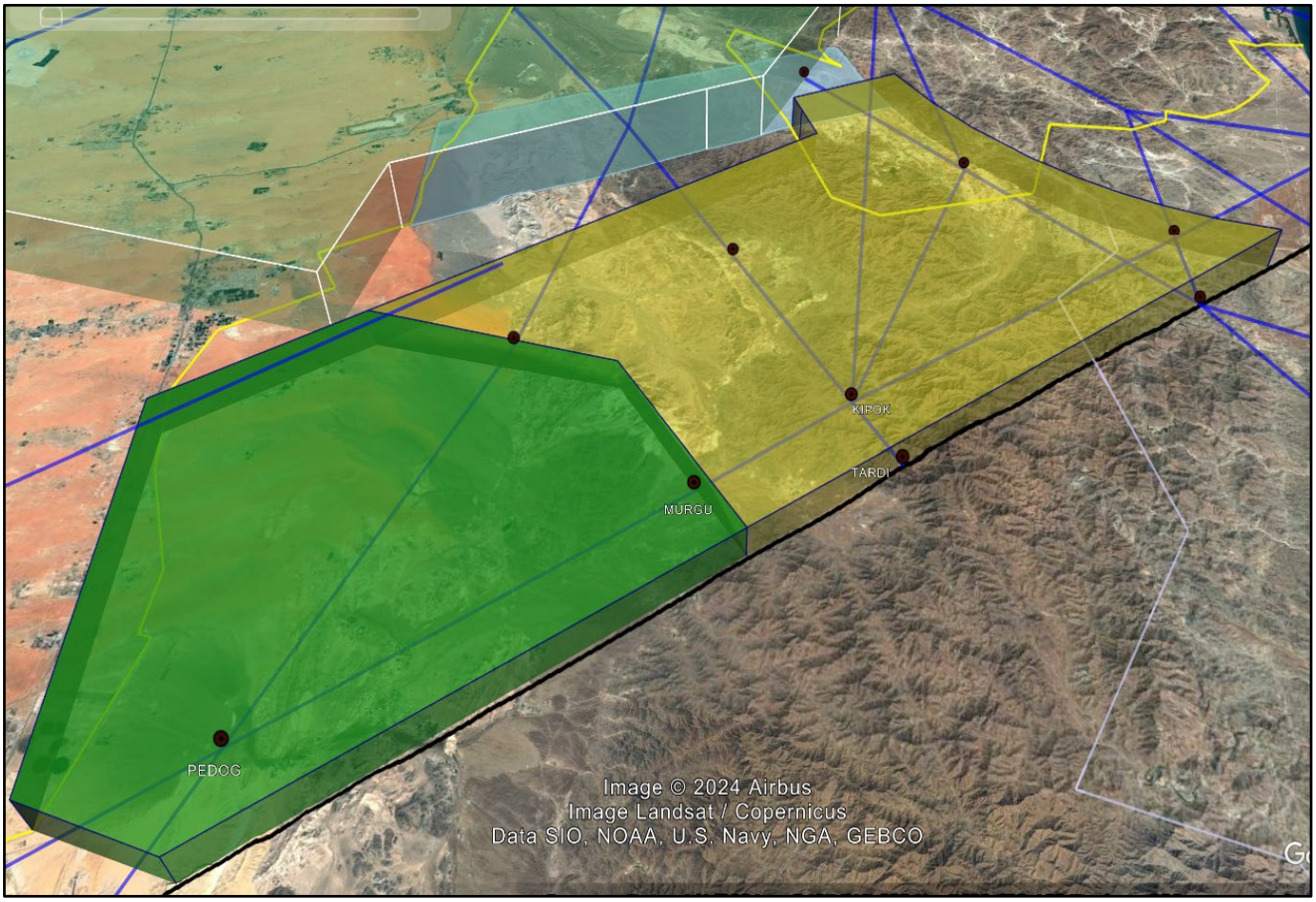


3.22.3 Collaborative Solutions for Shared Progress

3.22.3.1 To address these challenges, the UAE and Oman engaged in detailed negotiations and airspace design initiatives. The result was a mutually beneficial agreement that reopened critical airspace segments for use by training academies in both states while maintaining operational integrity for all airspace users.

3.22.3.2 The key outcomes of this initiative include:

- **Designated Training Areas**: Dedicated zones for aviation academies were strategically reopened, ensuring uninterrupted access for training while adhering to national standards for airspace management.
- **Enhanced Coordination**: Both States implemented harmonized airspace management practices, fostering seamless operations and reducing coordination complexities between ANSPs.
- **Support for ICAO Strategic Objectives**: The initiative directly supports ICAO's strategic objectives of enhancing global aviation safety, optimizing airspace capacity, and fostering the development of human resources in aviation.



3.22.4 Impact and Future Benefits

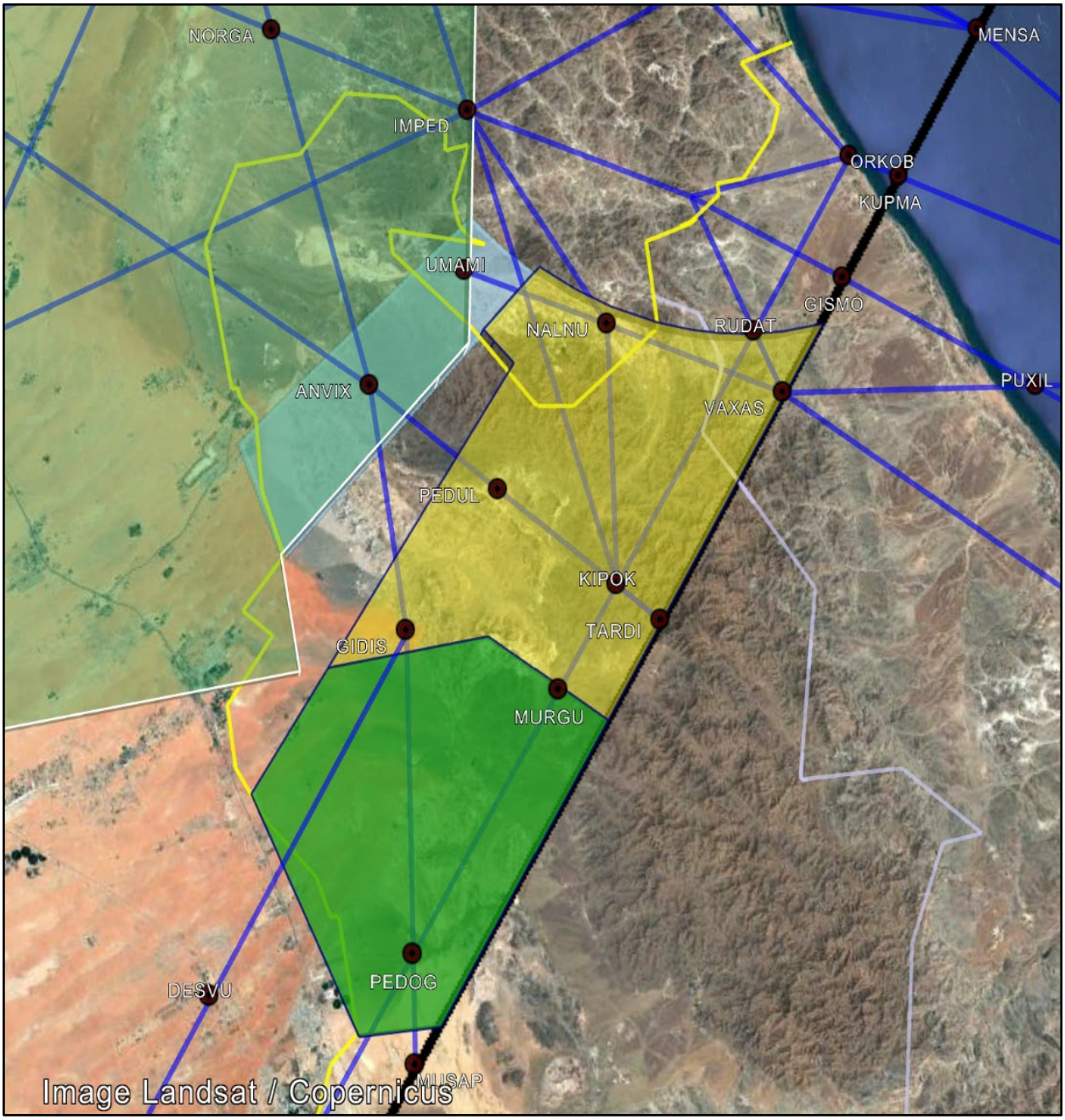
3.22.4.1 The reopening of training areas between the UAE and Oman stands as a testament to the power of regional cooperation in advancing global aviation goals. This initiative not only addresses immediate operational needs but also contributes to the long-term growth of the aviation sector by:

- **Building Capacity**: Ensuring aviation academies have the resources necessary to train future professionals, thereby addressing the forecasted demand for pilots and other critical personnel.
- **Strengthening Safety**: Aligning operational practices with ICAO's Standards and Recommended Practices (SARPs) to uphold the highest safety levels in the shared airspace.
- **Driving Economic Growth**: Supporting the aviation industry as a key driver of economic prosperity for both nations.

3.22.5 Conclusion

3.22.5.1 The UAE and Oman have demonstrated the value of collaboration in overcoming challenges and fostering innovation in airspace management. This success story exemplifies the ICAO spirit of cooperation, highlighting how shared vision and action can enhance the global aviation system while promoting safety, efficiency, and sustainability.

3.22.5.2 This achievement sets a precedent for future collaborative endeavors, inspiring other regions to adopt similar approaches to address shared airspace challenges.


NORGA
MENSA
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NALNU
RUDAT
PUXIL
ANVIX
VAXAS
PEDUL
KIPOK
TARDI
GIDIS
MURGU
PEDOG
DESVU
MIISAP
Image Landsat / Copernicus

4. CONCLUSION

The overall implementation of priority 1 ASBU Threads/Elements in the MID Region is around **66.14%** compared to 60.14% in 2022. The implementation of some modules has been acceptable/good (more than 70%); such as APTA, ACAS, SNET, GADS, SURF, ASUR, and COMI. 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 Some States, in order, UAE, Qatar, Bahrain, Saudi Arabia, Kuwait, Oman & Jordan) have a good implementation Status 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%	70.00%	85.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	50.00%	100.00%	50.00%	100.00%	90.33%
	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	27.78%	87.50%	37.50%	75.67%	0.00%	0.00%	100.00%	100.00%	100.00%	40.00%	100.00%	50.00%	33.33%	100.00%	100.00%	63.45%
	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%	89.10%	0.00%	25.00%	0.00%	0.00%	100.00%	100.00%	100.00%	NA	33.33%	0.00%	0.00%	0.00%	50.00%	39.90%
	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%	61.00%	100.00%	66.67%	100.00%	100.00%	100.00%	NA	100.00%	NA	50.00%	50.00%	100.00%	67.17%
	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	33.33%	94.10%	25.00%	60.00%	100.00%	0.00%	100.00%	100.00%	100.00%	NA	100.00%	NA	66.67%	50.00%	100.00%	71.47%
	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	61.11%	78.13%	50.00%	100.00%	100.00%	0.00%	100.00%	100.00%	100.00%	NA	100.00%	0.00%	66.67%	50.00%	100.00%	71.85%
	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	50.00%	0.00%	0.00%	100.00%	66.67%	0.00%	NA	100.00%	NA	0.00%	0.00%	50.00%	33.51%
	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	33.33%	100.00%	33.33%	60.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	33.33%	0.00%	100.00%	50.00%	100.00%	72.14%
	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%	97.22%	66.66%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.59%
	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%	100.00%	100.00%	100.00%	75.00%	100.00%	87.22%
	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	30.00%	0.00%	0.00%	100.00%	66.67%	100.00%	NA	100.00%	NA	100.00%	100.00%	100.00%	63.55%
	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%	87.50%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.17%
	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	58.33%	NA	NA	100.00%	NA	0.00%	NA	100.00%	NA	NA	0.00%	0.00%	32.29%
	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	47.19%	62.57%	45.31%	69.64%	69.05%	45.83%	86.67%	94.44%	80.00%	50.00%	88.89%	60.00%	70.83%	48.33%	73.33%	66.14%

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