



International Civil Aviation Organization

AIR NAVIGATION SYSTEMS IMPLEMENTATION GROUP

Second Meeting (ANSIG/3)
(Cairo, Egypt, 2 – 4 July 2018)

Agenda Item 4: Performance Framework for Regional Air Navigation Implementation

**STATUS OF IMPLEMENTATION OF PIA3 BLOCK 0 MODULES
(B0-FRTO, B0-NOPS, B0-SNET AND B0-ACAS)**

(Presented by the Secretariat)

SUMMARY

This paper presents the status of implementation of the PIA3 Block 0 Modules (B0-FRTO, B0-NOPS, B0-SNET and B0-ACAS) in the MID Region and seeks ways and means to expedite the implementation in order to meet the agreed performance targets.

Action by the meeting is at paragraph 3.

REFERENCES

- ATM SG/4 Report
- CNS SG/8 Report
- MID Air Navigation Strategy (MID Doc 002)
- MID eANP Volume III

1. INTRODUCTION

1.1 Performance Improvement Area 3 (*Optimum Capacity and Flexible Flights – Through Global Collaborative ATM*) includes seven (7) Modules in Block 0 from which B0-FRTO, B0-NOPS, B0-SNET and B0-ACAS have been considered priority 1 for implementation in the MID Region.

2. DISCUSSION

B0-FRTO

2.1 B0-FRTO (Free-Route Operations) as a priority 1 Module, aims to improve operations through Enhanced En-Route Trajectories that allow the use of airspace which would otherwise be segregated (i.e. special use airspace) along with flexible routing adjusted for specific traffic patterns. This will provide greater routing possibilities, reducing potential congestion on trunk routes and busy crossing points, resulting in reduced flight length and fuel burn.

2.2 For the purpose of performance monitoring and reporting, two (2) elements were included in the MID Region Air Navigation Strategy: *Flexible Use of Airspace (FUA) and Flexible routing.*

Implementation reporting/monitoring

2.3 MIDANPIRG ATM Sub-Group is the main Regional monitoring body for the collection of data related to the B0-FRTO implementation in the MID Region.

2.4 At the national level, ATM Focal Points are responsible for following-up the B0-FRTO implementation issues and forwarding necessary data on the implementation of B0-FRTO to the ICAO MID Regional Office, as and when required

2.5 The meeting may wish to recall that the ATM SG/4 meeting (Amman, Jordan, 29 April-2 May 2018) noted that ICAO in collaboration with all Stakeholders upgraded the CIR 330 to a new ICAO Manual on Civil/Military Cooperation to provide more guidance on the implementation of civil/military corporation and FUA Concept. The FUA in accordance with the ICAO provisions should be implemented into three Levels:

- Strategic level – Level 1
- Pre-tactical level – Level 2
- Tactical level – Level 3

2.6 The ATM SG/4 meeting was apprised of the outcome of the ACAC/ICAO Civil/Military Workshop (Algiers, Algeria, 26-28 March 2018) organized jointly by ACAC and ICAO (EUR/NAT and MID Regional Offices). The meeting encouraged States to implement the recommendations at **Appendix A** emanating from the Workshop. The Workshop documentation are available on the ICAO MID Website: <https://www.icao.int/MID/Pages/2018/ACAC-ICAO%20Civ-Mil%20WS.aspx>

2.7 The ATM SG/4 meeting agreed to the development of MID Guidance Material related to Civil/Military cooperation and implementation of FUA Concept, including State aircraft operations under Due Regard in particular over the high seas, based on the EUR Doc 032. Accordingly, the meeting agreed to the following Draft Conclusion:

*DRAFT CONCLUSION 4/5: MID REGION GUIDANCE MATERIAL ON
CIVIL/MILITARY COOPERATION AND
IMPLEMENTATION OF FUA CONCEPT*

That, the ICAO MID Office develop draft guidance material related to Civil/Military Cooperation and implementation of FUA Concept, including State aircraft operations under Due Regard in particular over the high seas, to be coordinated with States before presentation to MIDANPIRG for endorsement

2.8 Based on the above, the ATM SG/4 meeting reviewed and agreed to a revised version of the ASBU B0-FRTO as at **Appendix B** to include elements addressing the three (3) Levels of FUA with their associated indicators and targets.

2.9 In the same vein, the meeting agreed to the Monitoring Table at **Appendix C** to be used for the monitoring of the status of implementation of the B0-FRTO, which should be included in the MID eANP Volume III.

2.10 It is to be highlighted that MIDANPIRG/15 meeting established the MID Civil/Military Support Team, with a view to expedite the implementation of the FUA Concept in the MID Region. Accordingly, the States were encouraged to coordinate with the ICAO MID Regional Office for the conduct of National Civil/Military Cooperation Workshops.

B0-NOPS

2.11 Air Traffic Flow Management (ATFM) is used to manage the flow of traffic in a way that minimizes delay and maximizes the use of the available airspace. ATFM can regulate traffic flows involving departure slots, smooth flows and manage rates of entry into airspace along traffic axes, manage arrival time at waypoints or Flight Information Region (FIR)/sector boundaries and re-route traffic to avoid saturated areas. ATFM may also be used to address system disruptions including crisis caused by human or natural phenomena.

2.12 B0-NOPS (Network Operations) as a priority 1 Module, aims to improve flow performance through planning based on a network-wide view through the implementation of ATFM/Collaboration Decision Making (CDM)

2.13 For the purpose of performance monitoring and reporting, one (1) basic element has been included in the MID Region Air Navigation Strategy: *ATFM Measures implemented in collaborative manner.*

2.14 The meeting may wish to note that the ATM SG/4 meeting reviewed and agreed to a revised version of the ASBU B0-NOPS as at **Appendix B** to include additional element related to ATFM Structure with its associated indicator and target. The meeting also agreed to the Monitoring Table at **Appendix C** to be used for the monitoring of the status of implementation of the B0-NOPS, which should be included in the MID eANP Volume III.

Implementation reporting/monitoring

2.15 MIDANPIRG ATM Sub-Group is the main Regional monitoring body for the collection of data related to the B0-NOPS implementation in the MID Region.

2.16 At the national level, ATM Focal Points are responsible for following-up the B0-NOPS implementation issues and forwarding necessary data on the implementation of B0-NOPS to the ICAO MID Regional Office, as and when required.

Challenges and recommendations

2.17 The main challenges related to the implementation of NOPS are related to the establishment of ATFM structure/functions at ATS Units, effective coordination between ATFM units, sharing of information, establishment of a regional/sub-regional ATFM system/centre, etc.

2.18 The meeting may wish to note that the First meeting of the ICAO ATFM Task Force and the First meeting of the ICAO World Cup 2022 Task Force, which were established by MIDANPIRG/16, will be held back-to-back in Muscat, Oman, from 23 to 27 September 2018. The meetings will be kindly hosted by the Public Authority for Civil Aviation (PACA)-Oman.

2.19 The ATFM TF/1 meeting main objective is to discuss and agree on the initial version of an ATFM Concept of Operations to be implemented in the MID Region taking into consideration all previous initiatives related to ATFM implementation.

2.20 The World Cup 2022 TF/1 meeting is expected to discuss the way forward for the development and implementation of a collaborative regional action plan to accommodate the expected high increase in traffic, in a safe and efficient manner, taking into consideration similar experiences. The MIDNAPIRG/16 meeting agreed that the Task Force would also address other major events such as the EXPO 2020.

B0-SNET

2.21 B0-SNET (Safety Nets) enables the monitoring of flights while airborne to provide timely alerts to air traffic controllers of potential risks to flight safety. Ground-based safety nets make an essential contribution to safety and remain required as long as the operational concept remains human centered.

2.22 For the purpose of performance monitoring and reporting, two (2) elements have been included in the MID Region Air Navigation Strategy: *Short-term conflict alert (STCA)* and *Minimum safe altitude warning (MSAW)* with their associated Performance Indicators/Supporting Metrics, Targets.

Implementation reporting/monitoring

2.23 MIDANPIRG ATM Sub-Group is the main Regional monitoring body for the collection of data related to the B0-SNET implementation in the MID Region.

2.24 At the national level, ATM Focal Points are responsible for following-up the B0-SNET implementation issues and forwarding necessary data on the implementation of B0-SNET to the ICAO MID Regional Office, as and when required.

Data collection mechanism

2.25 The ATM SG/4 meeting reviewed and updated the status of implementation of the ASBU B0-SNET and agreed to the Monitoring Table at **Appendix C** to be used for the monitoring of the status of implementation of the B0-SNET, which should be included in the MID eANP Volume III.

B0-ACAS

2.26 B0-ACAS (Airborne Collision Avoidance Systems) as a priority 1 Module, aims to provide short-term improvements to existing ACAS in order to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory deviations and increase safety in cases where there is a breakdown of separation.

2.27 For the purpose of performance monitoring and reporting, one (1) element has been included in the MID Region Air Navigation Strategy: Avionics (TCAS V7.1).

2.28 The CNS SG/8 meeting agreed that, for better monitoring, the effective date of the ACAS carriage regulations should be added to the Table B0-ACAS in the eANP Vol III as in **Appendix C**.

Challenges

2.29 The main challenges related to the implementation of B0-ACAS is related mainly to development of necessary civil aviation regulations to mandate carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons and to ensure compliance by the air operators.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review and update the status of implementation of B0-FRTO, B0-NOPS, B0-SNET and B0-ACAS;
- b) identify the difficulties faced in the implementation of B0-FRTO, B0-NOPS, B0-SNET and B0-ACAS;

- c) recommend measures to expedite the implementation process and meet the agreed performance targets; and
- d) agree on the proposed changes to B0-FRTO, B0-NOPS and B0-SNET Modules and the inclusion of their relevant Monitoring Tables in the MID ANP Volume III.

**ACAC/ICAO CIVIL/MILITARY Workshop
(Algiers, Algeria, 26-28 March 2018)**

Recommendations

The Workshop emphasized the need to manage the airspace in a flexible and dynamic manner that should be shared between civil and military airspace users to cope with economic development as well as security and air defence aspects.

The Workshop encouraged States to take necessary measures to implement the ICAO provisions related to civil/military cooperation ensuring the effective implementation of the flexible use of airspace concept.

States were encouraged to:

- a) establish necessary national legislative/regulatory framework for civil/military cooperation at the highest level;
- b) develop National civil/military cooperation policy/principles and practices supported by national high-level commitment;
- c) establish a high-level policy body, and the necessary civil/military committees and working groups of subject matters experts to address, among other things: identification of shared goals, airspace management principles, collaboration processes and procedures, technical considerations, sharing of information, and human factors, etc.;
- d) review national provisions related to airspace management to accommodate the requirements of all airspace users (civil and military) to enhance major traffic flows and accommodate expected future growth of traffic;
- e) develop/update and implement a National FUA Plan with clear procedures related to the application of the three FUA levels (strategic, pre-tactical and tactical) with due consideration to mutual understanding, trust and communication;
- f) develop integrated plan for the use of technology in support of civil/military cooperation ensuring systems interoperability, effective data exchange, while addressing associated cyber security issues in a proactive manner;
- g) establish key performance indicators to measure the performance/efficiency of the FUA implementation, where applicable;
- h) organize workshops, seminars, meetings at national level related to civil/military cooperation and FUA (with the support of ICAO, ACAC and International Organizations);
- i) share experience and best practices related to civil/military cooperation and FUA implementation;
- j) participate in cross border initiatives to enhance the regional ATS route network, airspace management and Search and Rescue at regional and inter-regional levels; and
- k) use the ICAO EUR Doc 032 (Interim Guidance material on Civil/Military Cooperation In ATM) in particular the guidance related to FUA over the high seas and the example for State aircraft operations under Due-Regard.

APPENDIX B

<i>B0 – FRT0: Improved Operations through Enhanced En-Route Trajectories</i>					
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Status	Remarks
Flexible Use of Airspace (FUA) Level 1 Strategic	All States	Indicator: % of States that have implemented FUA Level 1 Supporting metric*: number of States that have implemented FUA Level 1	50% by Dec. 2019		
FUA Level 2 Pre-tactical	All States	Indicator: % of States that have implemented FUA Level 2 Supporting metric*: number of States that have implemented FUA Level 1	60% by Dec. 2020		
FUA Level 3 Tactical	All States	Indicator: % of States that have implemented FUA Level 2 Supporting metric*: number of States that have implemented FUA Level 2	60% by Dec. 2022		

B0 – NOPS: Improved Flow Performance through Planning based on a Network-Wide view			
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
ATFM Measures implemented in collaborative manner	All States	Indicator: % of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision Supporting metric: number of States that have established a mechanism for the implementation of ATFM Measures based on collaborative decision	100% by Dec. 2018
ATFM Structure	All States	Indicator: % of States that have established an ATFM Structure Supporting metric: number of States that have established an ATFM Structure	100 % by 2019

B0 – ACAS: ACAS Improvements					
Elements	Applicability	Performance Indicators/Supporting Metrics	Targets	Status	Remarks
Avionics (TCAS V7.1)	All States	Indicator: % of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons Supporting metric: Number of States requiring carriage of ACAS (TCAS v 7.1) for aircraft with a max certificated take-off mass greater than 5.7 tons	100% by Dec. 2017	80% (12 States)	Data collected by CNS SG Secretariat

Table B0-FRTO

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
 - 2 Status of implementation of Flexible Use of Airspace (FUA) Level 1-Strategic.
 - 3 Status of implementation of Flexible Use of Airspace (FUA) Level 2-Pre-tactical
 - 4 Status of implementation of Flexible Use of Airspace (FUA) Level 3-Tactical
- Implementation should be based on the published aeronautical information:
 FI – Fully Implemented
 PI – Partially Implemented
 NI – Not Implemented
- 5 Remarks

Applicability State	FUA Level 1	FUA Level 2	FUA Level 3	Remarks
1	2	3	4	5
Bahrain				
Egypt				
Iran				
Iraq				
Jordan				
Lebanon				
Libya				
Kuwait				
Oman				
Qatar				
Saudi Arabia				
Sudan				
Syria				
Unite Arab Emirates				
Yemen				
Total				
Percentage				

Table B0-NOPS

EXPLANATION OF THE TABLE

Column

- 1 Name of the State
- 2 Mechanism for the implementation of ATFM Measures based on collaborative decision.
Reference to documentation related to the established mechanism for the implementation of
- 3 ATFM Measures based on collaborative decision
Status of the establishment of ATFM Structure
- 4
- 5 Reference to documentation reflecting the establishment of the ATFM Structure
- 6 Remarks

Applicability State	Mechanism for the implementation of ATFM Measures based on collaborative decision	Reference	ATFM Structure	Reference	Remarks
1	2	3	4	5	6
Bahrain					
Egypt					
Iran					
Iraq					
Jordan					
Lebanon					
Libya					
Kuwait					
Oman					
Qatar					
Saudi Arabia					
Sudan					
Syria					
UAE					
Yemen					
Total					
Percentage					

TABLE B0-SNET

EXPLANATION OF THE TABLE

Column

- 1 Name of the State and ATS Units within a State providing Enroute and Approach services
- 2 Enroute and Approach ATS Units providing Radar services “R”
- 3 Enroute and Approach ATS Units providing Procedural services “P”
- 4 Enroute and Approach ATS Units within a State providing radar services where Short-Term Conflict Alert (STCA) was implemented
- 5 Enroute and Approach ATS Units within a State providing radar services where Minimum Safe Altitude Warning (MSAW) was implemented
- 6 Action Plan for the implementation of STCA and MSAW
- 7 Status of implementation of STCA and MSAW (reference to column 2)

State/ ATS Units (ENR & APP)	ATS		STCA	MSAW	Action Plan	Status
	R	P				
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
Bahrain	2	0	2	2		
Bahrain ACC	R		Y	Y		STCA 100%
Bahrain APP	R		Y	Y		MSAW 100%
Egypt	7	1				
Cairo ACC	R		Y	Y		
Alex APP	R		Y	Y		
Aswan APP	R		Y	Y		STCA 100%
Cairo APP	R		Y	Y		
Luxor APP	R		Y	Y		MSAW 100%
Hurghada APP	R		Y	Y		
Marsa APP		P	N/A	N/A		
Sharm APP	R		Y	Y		
Iran	5	2				
Tehran ACC	R		Y	Y		
Bandar Abbas APP		P	N/A	N/A		
Esfahan APP	R		Y	Y		STCA 100%
Mashhad APP	R		Y	Y		
Mehrabad APP	R		Y	Y		MSAW 100%
Shiraz APP	R		Y	Y		
Tabriz APP		P	N/A	N/A		
Iraq	2	0				
Baghdad ACC	R		Y	Y		STCA 100%
Baghdad APP	R		Y	Y		MSAW 100%
Jordan	2	1				STCA 100%

State/ ATS Units (ENR & APP)	ATS		STCA	MSAW	Action Plan	Status
	R	P				
1	2	3	4	5	6	7
Amman ACC	R		Y	Y		MSAW 100%
Amman APP	R		Y	Y		
Aqaba APP		P	N/A	N/A		
Kuwait	2	0				STCA 100%
Kuwait ACC	R		Y	Y		MSAW 100%
Kuwait APP	R		Y	Y		
Lebanon	2	0				STCA 100%
Beirut ACC	R		Y	Y		MSAW 100%
Beirut APP	R		Y	Y		
Libya	0	4				STCA 0%
Tripoli ACC		P	N/A	N/A		MSAW 0%
Tripoli APP		P	N/A	N/A		
Benghazi Centre		P	N/A	N/A		
Benghazi APP		P	N/A	N/A		
Oman	3	0				STCA 100%
Muscat ACC	R		Y	Y		MSAW 100%
Seeb APP	R		Y	Y		
Salalah APP	R		Y	Y		
Qatar	1	0				STCA 100%
Doha Radar	R		Y	Y		MSAW 100%
Saudi Arabia	6	0				STCA 100%
Jeddah ACC	R		Y	Y		MSAW 100%
Riyadh ACC	R		Y	Y		
Jeddah APP	R		Y	Y		
Riyadh APP	R		Y	Y		
Madina APP	R		Y	Y		
Damam APP	R		Y	Y		
Sudan	2	3				STCA 100%
Khartoum ACC	R		Y	Y		MSAW 100%
Khartoum APP	R		Y	Y		
Elobeid APP		P	N/A	N/A		
Nyala APP		P	N/A	N/A		
Port Sudan APP		P	N/A	N/A		
Syria	0	4				STCA 0%
Damascus ACC		P				MSAW 0%

State/ ATS Units (ENR & APP)	ATS		STCA	MSAW	Action Plan	Status
	R	P				
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
Damascus ACC		P				
Aleppo APP		P				
Latakia APP		P				
UAE	7	0	6	6		STCA 86% MSAW 86%
SZC	R		Y	Y		
Al Ain APP	R		Y	Y		
Abu Dhabi Radar	R		Y	Y		
Al Maktoum APP	R		Y	Y		
Dubai Radar	R		Y	Y		
Fujairah APP	R		Y	Y		
RAS AL KHAIMAH	R		N	N		
Yemen		3				STCA 0% MSAW 0%
Sana'a ACC		P	N/A	N/A		
Aden APP		P	N/A	N/A		
Sana'a APP		P	N/A	N/A		
Total	41	18	40 Y	40 Y		STCA 97%
Percentage			18 N/A	18 N/A		MSAW 97%

ACAS V7.1 Status and regulation reference

State	Status	Regulation Reference	Effective Date	Remarks
1	2	3	4	5
Bahrain	Y	Aeronautical Circular AC/OPS/05/2015 dated 10th of March 2015		Air Navigation Technical Regulations (ANTR) updated to reflect Annex 10 (Volume IV) Reference needs to be provided http://www.mtt.gov.bh/content/aa-laws-and-regulations
Egypt	Y	ECAR Part 121.356 & ECAR Part 91.221		Egyptian Civil Aviation Regulation (ECAR) Parts 121 and 91 have been updated in accordance with the relevant provisions of ICAO Annex 10, Volume IV, Ch.4 http://www.civilaviation.gov.eg/Regulations/regulation.html
Iran	Y	Aeronautical Telecommunications bylaw, articles 3 and 4		According to articles 3 and 4 of Iran aeronautical telecommunications by law, ratified by board of ministers, Airborne collision avoidance systems are categorized as aeronautical telecommunications systems and should be manufactured, installed and maintained according to standards of Annex 10. -Since no difference to ICAO annex 10 is notified, ACAS V 7.1 is mandatory according to provisions of annex 10 amendment 85. -Airworthiness directives issued by FAA and EASA shall to be implemented by Iranian AOC holders.
Iraq	N			
Jordan	Y	JCAR-OPS.1 (1.668 airborne collision avoidance system)		
Kuwait	Y	Kuwait Civil Aviation Safety Regulations – Part 6 – Operation of Aircraft, Para. 6.20.4		

State	Status	Regulation Reference	Effective Date	Remarks
1	2	3	4	5
Lebanon	Y			Regulation reference needs to be provided
Libya	N			
Oman	Y			Regulation reference needs to be provided
Qatar	Y	QCAR – OPS 1, Subpart K, QCAR – OPS 1.668 – Airborne collision avoidance system QCAR Part 10 - Volume4 Chapter 4 Airborne Collision Avoidance System		References: http://www.caa.gov.qa/en/safety_regulations
Saudi Arabia	Y	GACAR PART 91 – Appendix C		
Sudan	Y	Amended Annex 10 (V4)- ANNESX 6 (V2)		According to adopted annexes to Sudan Regulations (SUCAR 10 V4 Par. 4.3.5.3.1 and SUCAR 6 V2 par 2.05.15)
Syria	N			
UAE	Y	CAR-OPS 1.668 Airborne Collision Avoidance System (See IEM OPS 1.668) and CAAP 29 and AIP 1.5.6.6		https://www.gcaa.gov.ae/en/ePublication/Pages/CARs.aspx?CertD=CARs
Yemen	Y			Reference need to be provided

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