INTERNATIONAL CIVIL AVIATION ORGANIZATION

**REPORT OF THE FIFTH MEETING OF THE
PERFORMANCE BASED NAVIGATION SUB-GROUP**

PBN SG/5 Virtual Meeting

(19 – 20 October 2020)

The views expressed in this Report should be taken as those of the PBN Sub-Group and not of the Organization. This Report will, however, be submitted to the MIDANPIRG and any formal action taken will be published in due course as a Supplement to the Report.

Approved by the Meeting
and published by authority of the Secretary General

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PART I – HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1   The Fifth meeting of the Performance Based Navigation Sub-Group (PBN SG/5) was successfully held virtually from 19 to 20 October from 08:00 to10:00 UTC, using MS Teams facility.

2. OPENING

2.1   The meeting was chaired by Mr. Ahmed Mohamed Al Eshaq, Director of Air Navigation, Civil Aviation Authority, Qatar, who welcomed the participants and wished them a successful and fruitful meeting.

2.2   Mr. Mohamed Smaoui, Acting Regional Director, Middle East Office, welcomed all participants to the PBN SG/5 meeting and recalled the main outcomes of the MSG/7 meeting held virtually from 1 to 3 September 2020 including the need for the MIDANPIRG Sub-Groups to conduct virtual meetings in the 4th quarter of 2020 to review the GANP 6th Edition and identify ASBU priority 1 Threads and Elements and associated monitoring elements, considering the Secretariat proposal and States' and stakeholders' inputs.

2.3   Mr. Smaoui highlighted also the main outcomes of the MID ASBU Webinar held on 13 – 15 October 2020 and underlined that the PBN SG/5 meeting should further review and finalize the Monitoring Table of the APTA Thread (Block 0 & 1 Elements).

2.4   Finally, Mr. Smaoui thanked all participants for their attendance wishing them successful and productive meeting.

3. ATTENDANCE

3.1   The meeting was attended by a total of eighty-one (81) participants from twelve (12) States (Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, UAE and USA) and five (5) International Organizations/Industry (ACAO, CANSO, IATA, Jeppesen and ICAO). The list of participants is at **Attachment A** to the Report.

4. OFFICERS AND SECRETARIAT

4.1   The meeting was chaired by Mr. Ahmed Mohamed Al Eshaq, Director of Air Navigation, Civil Aviation Authority, Qatar.

4.2   Mr. Radhouan Aissaoui, Regional Officer, Information Management was the Secretary of the meeting, assisted by Mr. Ahmad Amireh, Regional Officer, Air Traffic Management and Search and Rescue (ATM/SAR) and Mr. Ahmad Kaveh, Regional Officer, Air Traffic Management (ATM). Mr. Mohamed Smaoui, Acting Regional Director, supported the meeting.

5. LANGUAGE

5.1   The discussions were conducted in the English language and documentation was issued in English.

6. AGENDA

6.1   The following Agenda was adopted:

Agenda Item 1:   Adoption of the Provisional Agenda

Agenda Item 2:   Follow-up on MIDANPIRG/17 and MSG/7 Conclusions and Decisions relevant to PBN

Agenda Item 3:   Global and Regional Developments

Agenda Item 4:   Revised MID Air Navigation Strategy

Agenda Item 5:   Future Work Programme

Agenda Item 6:   Any other Business

7. CONCLUSIONS AND DECISIONS – DEFINITION

7.1   The MIDANPIRG records its actions in the form of Conclusions and Decisions with the following significance:

a) **Conclusions** deal with matters that, according to the Group's terms of reference, merit directly the attention of States, or on which further action will be initiated by the Secretary in accordance with established procedures; and

b) **Decisions** relate solely to matters dealing with the internal working arrangements of the Group and its Sub-Groups.

8. LIST OF DRAFT CONCLUSIONS AND DRAFT DECISIONS

DRAFT DECISION 5/1:   TERMS OF REFERENCE OF THE PBN SUB-GROUP

 PART II: REPORT ON AGENDA ITEMS

REPORT ON AGENDA ITEM 1:   ADOPTION OF THE PROVISIONAL AGENDA

1.1   The meeting reviewed and adopted the Provisional Agenda as at Para 6 of the History of the Meeting.

REPORT ON AGENDA ITEM 2:   **FOLLOW-UP ON MIDANPIRG/17 AND MSG/7 CONCLUSIONS AND DECISIONS RELEVANT TO PBN**

2.1   The meeting noted the status of the MIDANPIRG/17 and MSG/7 Conclusions and Decisions relevant to PBN and the follow-up actions taken by concerned parties as at **Appendix 2A**.

REPORT ON AGENDA ITEM 3:   GLOBAL AND REGIONAL DEVELOPMENTS RELATED TO PBN

GLOBAL DEVELOPMENTS RELATED TO PBN

3.1   The subject was addressed in PPT/3 presented by the Secretariat.

3.2   The meeting was apprised of the PBN Study Group activities related to discussions of the Draft Doc 9613 Edition 5 and the list of main Changes from Edition 4.

Adoption/Approval of Amendments to ICAO Annexes and PANS

3.3   The meeting noted the following:

- adoption of Amendment 92 to Annex 10 applicable 5 November 2020;
- approval of Amendment 9 to the Procedures for Air Navigation Services — Aircraft Operations, (PANS-OPS, Doc 8168) Volume I— Flight Procedures;
- approval of Amendment 9 to PANS-OPS Volume II — Construction of Visual and Instrument Flight Procedures.

RNAV TO RNP INSTRUMENT APPROACH CHART DEPICTION

3.4   The meeting recalled that the Amendment 6 to the Procedures for Air Navigation Services — Aircraft Operations (PANS-OPS, DOC 8168) introduced a change to the approach charts by introducing the "PBN Requirements Box" and a change in chart identifications for performance-based navigation (PBN) approaches (transition from RNAV to RNP approach chart identification).

3.5   The meeting noted that ICAO is providing the PBN charting website, containing Regional Transition Plans and the central repository of information that will be available soon. This will identify, graphically, those States that have indicated a timeline for the transition as well as those which have finally completed this work. The website link is: https://www.icao.int/safety/charting/.

3.6   The meeting underlined the importance of regional coordination to minimize the impact of the change and that States may require to consider implementing the new charts earlier than the final deadline of 30 November 2022. Planning for this change will need to start early enough to ensure a smooth transition. Accordingly, MID States were requested to consider this activity in their plans and to ensure sufficient time is allocated to this task to successfully implement the transition from RNAV to RNP approach chart identification, in a smooth and timely manner.

3.7   The meeting reiterated the procedure included in the MID Region PBN Implementation Plan (MID Doc 007) as the MID Region Transition Plan from RNAV to RNP Charting Depiction and urged States that have not yet done so to:

- implement RNAV to RNP Chart naming convention for their current PBN Approach Procedures published in their AIPs, until 8 September 2022.
- provide the ICAO MID Office with their action plan for the implementation of RNAV to RNP Chart naming convention, and keep the MID Office apprised of the status of implementation, highlighting the total number of approach procedures and those that were published in accordance with the new naming convention.

3.8   The meeting noted with appreciation that many States have already begun to implement the new chart identification, and a number of new charts have been published in the AIPs. The list of States and the number of charts published is provided in the table below.

State	Total PBN APTs	Total PBN Approaches	Number of PBN APCHs using new name	% of PBN APCHs using new name	Status
Bahrain	1	4	0	0%	Not started
Egypt	17	17	41	100.00%	Completed
Iran	3	4	4	100.00%	Completed
Iraq	4	8	2	25.00%	In progress
Jordan	3	6	0	0%	Not started
Kuwait	1	12	0	0%	Not started
Lebanon	1	4	0	0%	Not started
Libya	0	0	0	-	-
Oman	8	8	16	100.00%	Completed
Qatar	2	6	6	100.00%	Completed
Saudi Arabia	4	17	12	70.58 %	In progress
Sudan	4	8	2	25%	In progress
Syria	1	1	0	0%	Not started
UAE	8	28	6	28.57%	In progress
Yemen	2	3	0	0%	Not started

REPORT ON AGENDA ITEM 4:   REVISED MID AIR NAVIGATION STRATEGY

4.1   The subject was addressed in PPT/4 presented by the Secretariat.

4.2   The meeting recalled that the MSG/7 meeting held virtually from 1 to 3 September 2020 noted that the Global Air Navigation Plan 6th Edition endorsed by the 40th session of the ICAO General Assembly brought major changes, which need to be reflected in the next version of the MID Region Air Navigation Strategy. The MSG/7 meeting agreed also that the MIDANPIRG Sub-Groups should conduct virtual meetings in the 4th quarter of 2020 to review the GANP 6th Edition and identify ASBU priority 1 Threads and Elements and associated monitoring elements, considering the Secretariat proposal and States' and stakeholders' inputs.

4.3   The meeting noted that the MID ASBU Webinar held on 13 – 15 October 2020, provided an opportunity to familiarize the participants with the 6th Edition of the GANP (multi-layer Structure, Performance Framework, Basic Building Block (BBB) Framework); and showcase the different ASBU Threads through online demonstration using the GANP Portal, for harmonization purpose and an increased efficiency of the MIDANPIRG Sub-Groups during the discussion of the subject.

4.4   The meeting noted also that the MID ASBU Webinar identified the ASBU Threads and elements, which would be proposed to MIDANPIRG/18 as priority 1 further to the review, agreement or amendment by the relevant MIDANPIRG Sub Groups.

4.5   The meeting reviewed the APTA Thread and agreed to the prioritization of the different elements of Block 0 and Block 1 as at **Appendix 4A**. The meeting reviewed and updated the monitoring elements related to the priority 1 elements, including the applicability areas, indicators, metrics, targets and timelines, as at **Appendix 4B**, and agreed that the table be included in the revised version of the MID Region Air Navigation Strategy to be presented to MIDANPIRG/18 for endorsement.

4.6   The meeting was apprised of the MID ASBU Webinar discussions related to the initial list of Key Performance Indicators to be used for performance monitoring at National and Regional levels, as at **Appendix 4C**.

4.7   The meeting urged States, that have not yet done so, to share their Air Navigation priorities and updated National Plans, with the ICAO MID Office in response to SL: AN 1/5 – 20/178 dated 1 October 2020, as a Follow-up action to the MSG/7 Conclusion 7/6.

REPORT ON AGENDA ITEM 5: FUTURE WORK PROGRAMME

5.1 The meeting reviewed and updated the PBN SG Terms of References (TORs) as at **Appendix 5A**. Accordingly, the meeting agreed to the following Draft Decision:

> ***DRAFT DECISION 5/1: TERMS OF REFERENCE OF THE PBN SUB-GROUP***
>
> *That, the Terms of Reference of the PBN Sub-Group be updated as at **Appendix 5A**.*

5.2 The meeting agreed that the PBN SG/6 meeting be held, virtually, during the fourth quarter of 2021.

REPORT ON AGENDA ITEM 6:   ANY OTHER BUSINESS

6.1   The meeting reminded States to provide the ICAO MID Regional Office with their updated PBN Implementation Plans on an annual basis (by end of December) in accordance with MSG Conclusion 4/11. The meeting recalled that the MSG/6 meeting, through MSG Conclusion 6/21, agreed that the States' National PBN Implementation Plans should be published on the MID Office website with the aim to facilitate consultation and planning of airspace users.

6.2   The meeting was apprised of the progress achieved with regard to the establishment/launch of the Middle East Flight Procedure Programme (MID FPP). It was noted that the recruitment process of the MID FPP Manager is ongoing (under the selection process after the advertisement). It was noted that the first meeting of the MID FPP Steering Committee is tentatively scheduled for April 2021 in Abu Dhabi (host), in case face-to-face meetings would be possible. The meeting recalled that the MID FPP would be a viable solution to support States at national level in meeting their obligations related to PANS-OPS and, in particular, the implementation of Performance Based Navigation (PBN) (regulatory and service provision); and encouraged States to join the MID FPP, if they have not yet done so, and participate in the MID FPP SC/1 meeting.

APPENDICES

FOLLOW-UP ACTION PLAN ON MIDANPIRG/17 AND MSG /7 CONCLUSIONS & DECISIONS

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
C. 17/10	**MID REGION AIR NAVIGATION REPORT (2019)** That, a) States be urged to provide the ICAO MID Office, with relevant data necessary for the development of the Fourth Edition of the MID Region Air Navigation Report (2019), by 1 December 2019; and b) the MID Region Air Navigation Report (2019) be presented to the MSG/7 for endorsement.	Monitoring and Reporting of ASBU implementation in the MID Region	State Letter Data for AN Report 2019 Air Navigation Report (2019)	ICAO States MSG/7	Dec. 2019 September 2020	**Completed** The MID Region Air Navigation Report – 2019 is endorsed and posted on the ICAO MID Website. (ref to MSG/7C. 7/7).
C. 17/11	**JOINT ACAO/ICAO ASBU SYMPOSIUM** That, a Joint ACAO/ICAO ASBU Symposium be organized beginning of 2020.	Raise awareness about the 6th Edition of the GANP and align the MID AN Strategy	Draft Revised MID AN Strategy			**Ongoing** . A MID ASBU webinar organised during 13-15 October 2020 Postponed to beginning of 2021 due to COVID-19
C. 7/6	**Update of MID Region Air Navigation Strategy** That, a) States be invited to provide the MID Office by 15 October 2020 with their Air Navigation priorities and updated national plan considering the provisions of the 6th edition of the GANP endorsed by the 40th session of the general assembly (A40); b) MIDANPIRG Sub-Groups provide proposals of amendment of the MID Region Air Navigation Strategy,	To update the MID Region Air Navigation Strategy (MID Doc 002) as per the GANP 6th Edition and identify ASBU priority 1 Threads/Elements and associated	Draft Revised MID AN Strategy	ICAO/ACAO	Q1 2021	**Ongoing**

No.	CONCLUSIONS AND DECISIONS	CONCERNS/ CHALLENGES (RATIONALE)	DELIVERABLE/ TO BE INITIATED BY		TARGET DATE	STATUS/REMARKS
	considering the 6th edition of the GANP and the inputs of States and Stakeholders, before 15 Dec 2020; and c) The joint ACAO/ICAO ASBU Symposium review the inputs of States and Stakeholders and MIDANPIRG sub-groups for consolidation of the revised version of the MID region Air Navigation Strategy to be presented to MIDANPIRG for endorsement.	monitoring elements				
C. 7/8	**MID REGION AIR NAVIGATION REPORT - 2020** That, a) States be urged to provide the ICAO MID Office, with relevant data necessary for the development of the MID Region Air Navigation Report - 2020, by 1 December 2020; and b) the MID Region Air Navigation Report-2020 be presented to the MIDANPIRG/18 for endorsement.	Monitoring and Reporting of ASBU implementation in the MID Region	State Letter Data for AN Report 2020 Air Navigation Report (2020)	ICAO States MIDANPIRG/18	October 2020 Dec. 2020 February 2020	**Ongoing**

DRAFT MID REGION APTA THREAD BLOCK 0 AND 1 PRIORITIZATION

Thread	Element code	Title	Priority	Start Date	Monitoring		Remarks
					Main	**Supporting**	
APTA	**B0/1**	PBN Approaches (with basic capabilities)	1	2014	PBN SG	ATM SG AIM SG CNS SG	
	B0/2	PBN SID and STAR procedures (with basic capabilities)	1	2014	PBN SG	ATM SG AIM SG	
	B0/3	SBAS/GBAS CAT I precision approach procedures	2				
	B0/4	CDO (Basic)	1	2014	PBN SG	ATM SG	
	B0/5	CCO (Basic)	1	2014	PBN SG	ATM SG	
	B0/6	PBN Helicopter Point in Space (PinS) Operations	2				
	B0/7	Performance based aerodrome operating minima – Advanced aircraft	1	2020	ATM SG	PBN SG AIM SG	
	B0/8	Performance based aerodrome operating minima – Basic aircraft	2				
	B1/1	PBN Approaches (with advanced capabilities)	2				
	B1/2	PBN SID and STAR procedures (with advanced capabilities)	2				

	B1/3	Performance based aerodrome operating minima – Advanced aircraft with SVGS	2				
	B1/4	CDO (Advanced)	2				
	B1/5	CCO (Advanced)	2				

MID REGION AIR NAVIGATION STRATEGY

APTA THREAD Monitoring Table (Block 0 & 1 Elements)

Element code	Title	Priority	Applicability	Performance Indicators/Supporting Metrics	Targets	Timelines
B0/1	PBN Approaches (with basic capabilities)	1	All RWYs ENDs at International Aerodromes	Indicator: % of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV) Supporting metric: Number of runways ends at international aerodromes provided with Baro-VNAV approach procedures (LNAV/VNAV)	100%	Dec. 2017
B0/2	PBN SID and STAR procedures (with basic capabilities)	1	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 runways ends at international aerodromes provided with PBN SIDs and STAR (basic capabilities).	70%	Dec. 2022
B0/4	CDO (Basic)	1	OBBI, HESH, HEMA, HEGN, OIIE, OIKB, OIFM, OJAI, OJAQ, OKBK, OLBA, OOMS, OTHH, OEJN, OEMA, OEDF, OERK, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CDO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CDO implemented as required.	100% (for the identified Aerodromes/ TMAs)	Dec. 2018
B0/5	CCO (Basic)	1	OBBI, HESN, HESH, HEMA, HEGN, HELX, OIIE, OIKB, OIFM, ORER, ORNI, OJAM, OJAI, OJAQ, OKBK, OLBA, OOMS, OOSA, OTHH, OEJN, OEMA, OEDF, OERK, HSNN, HSOB, HSSS, HSPN, OMAA, OMDB, OMDW, OMSJ	Indicator: % of International Aerodromes/TMA with CCO implemented as required. Supporting Metric: Number of International Aerodromes/TMAs with CCO implemented as required.	100% (for the identified Aerodromes/ TMAs)	Dec. 2018

4B-2

B0/7	Performance based aerodrome operating minima – Advanced aircraft	1	All States	Indicator: % of States authorizing Performance-based Aerodrome Operating Minima for Advanced aircraft. Supporting Metric: Number of States authorizing Performance-based Aerodrome Operating Minima for Advanced aircraft.	50%	Dec. 2021

DRAFT MID REGION Air Navigation KPIs

#	Title	Definition	Measurement Units	Objects Characterized	Data Requirement	Data Feed Providers
KPI01	Departure punctuality	Percentage of flights departing from the gate on-time (compared to schedule).	% of scheduled flights	The KPI is typically computed for traffic flows, individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each departing scheduled flight: – Scheduled time of departure (STD) or Scheduled off-block time (SOBT) – Actual off-block time (AOBT)	Schedule database(s), airports, airlines and/or ANSPs
KPI02	Taxi-out additional time	Actual taxi-out time compared to an unimpeded/reference taxi-out time.	Minutes/flight	The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each departing flight: – Actual off-block time (AOBT) – Actual take-off time (ATOT) In addition, for the advanced KPI variant: – Departure gate ID – Take-off runway ID	Airports (airport operations, A-CDM), airlines (OOOI data), ADS-B data providers and/or ANSPs
KPI03	ATFM slot adherence	Percentage of flights taking off within their assigned ATFM slot (Calculated Take-Off Time Compliance).	% of flights subject to flow restrictions	The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each departing IFR flight subject to an ATFM regulation: – Calculated Take-Off Time (CTOT) – Actual take-off time (ATOT)	Airports, ATFM service
KPI04	Filed flight plan en-route extension	Flight planned en-route distance compared to a reference ideal trajectory distance.	% excess distance	The KPI can be computed for any volume of en-route airspace; this implies that it can be computed at State level (covering the FIRs of a State).	For each flight plan: – Departure airport (Point A) – Destination airport (Point B) – Entry point in the 'Reference area' (Point O) – Exit point from the 'Reference area' (Point D) – Entry points in the 'Measured areas' (Points N) – Exit points from the 'Measured	ANSPs

#	Title	Definition	Measurement Units	Objects Characterized	Data Requirement	Data Feed Providers
					– areas' (Points X) – Planned distance for each NX portion of the flight	
KPI05	Actual en-route extension	Actual en-route distance flown compared to a reference ideal distance.	% excess distance	The KPI can be computed for a traffic flow or a volume of en-route airspace; this implies that it can be computed at State level (covering the FIRs of a State).	For each actual flight trajectory: – Departure airport (Point A) – Destination airport (Point B) – Entry point in the 'Reference Area' (Point O) – Exit point from the 'Reference Area' (Point D) – Entry points in the 'Measured Areas' (Points N) – Exit points from the 'Measured Areas' (Point X) – Distance flown for each NX portion of the actual flight trajectory, derived from surveillance data (radar, ADS-B…).	ANSPs, ADS-B data providers
KPI06	En-route airspace capacity	The maximum volume of traffic an airspace volume will safely accept under normal conditions in a given time period.	Variant 1: Movements/hr Variant 2: Number of aircraft (occupancy count)	The KPI is typically used at the level of individual sectors (sector capacity) or en-route facilities (ACC capacity).	The various capacities are determined by the ANSP, and are dependent on traffic pattern, sector configuration, ATCO and system capability, etc.	ANSPs
KPI07	En-route ATFM delay	ATFM delay attributed to flow restrictions in a given en-route airspace volume	Minutes/flight	The KPI can be computed for any volume of en-route airspace which participates in the ATFM process.	For each IFR flight: - Estimated Take-off Time (ETOT) computed from the last filed flight plan - Calculated Take-off Time (CTOT) - ID of the flow restriction generating the ATFM delay - Airspace volume	ATFM

#	Title	Definition	Measurement Units	Objects Characterized	Data Requirement	Data Feed Providers
					associated with the flow restriction - Delay code associated with the flow restriction	
KPI08	Additional time in terminal airspace	Actual terminal airspace transit time compared to an unimpeded time. Actual trajectories are generally longer in time and distance due to path stretching and/or holding patterns. In the example below the unimpeded trajectories are shown in red, and the actual trajectories in green and blue. See Figure 1: Terminal trajectories.	Minutes/flight	The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each arriving flight: – Terminal airspace entry time, computed from surveillance data (radar, ADS-B…) – Actual landing time (ALDT) – In addition, for the advanced KPI variants: – Terminal airspace entry segment, computed from surveillance data (radar, ADS-B…) – Landing runway ID	Airlines (OOOI data), airports, ADS-B data providers and/or ANSPs
KPI09	Airport peak capacity	The highest number of operations an airport can accept in a one-hour time frame (also called declared capacity). Can be computed for arrivals, departures or arrivals + departures.	Number of departures / hour, Number of landings / hour, Number of (departures + landings) / hour	The KPI is computed for individual airports.	Scheduling parameters for slot controlled airports Airport Acceptance Rates (AAR), Airport Departure Rates (ADR)	Airports
KPI10	Airport peak throughput	The 95th percentile of the hourly number of operations recorded at an airport, in the	Number of departures / hour, Number of landings /	The KPI is computed for individual airports.	For each flight: – Actual landing time (ALDT) – Actual take-off time (ATOT).	Airports

#	Title	Definition	Measurement Units	Objects Characterized	Data Requirement	Data Feed Providers
		"rolling" hours sorted from the least busy to the busiest hour. Can be computed for arrivals, departures or arrivals + departures.	hour, Number of (departures + landings) / hour			
KPI11	Airport throughput efficiency	Airport throughput (accommodated demand) compared to capacity or demand, whichever is lower. Can be computed for arrivals, departures or arrivals + departures.	Average Over/Under Delivery or % of accommodated operations.	The KPI is computed for individual airports.	For each arriving and/or departing flight: – Actual landing time (ALDT) and take-off time (ATOT) – Estimated landing time (ELDT) and take-off time (ETOT) (from flight plan) For each time interval: – Declared landing capacity of the airport – Declared departure capacity of the airport – Declared total capacity of the airport	Airports
KPI12	Airport/Terminal ATFM delay	ATFM delay attributed to arrival flow restrictions at a given airport and/or associated terminal airspace volume.	Minutes/flight	The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each IFR flight: – Estimated Take-off Time (ETOT) computed from the last filed flight plan – Calculated Take-off Time (CTOT) – ID of the flow restriction generating the ATFM delay – Airport or terminal airspace volume associated with the flow restriction – Delay code associated with the	ATFM

#	Title	Definition	Measurement Units	Objects Characterized	Data Requirement	Data Feed Providers
					flow restriction	
KPI13	Taxi-in additional time	Actual taxi-in time compared to an unimpeded/reference taxi-in time	Minutes/flight	The KPI is typically computed for individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each arriving flight: Actual landing time (ALDT) Actual in-block time (AIBT) In addition, for the advanced KPI variant: Landing runway ID Arrival gate ID	Airports (airport operations), airlines (OOOI data), ADS-B data providers and/or ANSPs
KPI14	Arrival punctuality	Percentage of flights arriving at the gate on-time (compared to schedule)	% of scheduled flights	The KPI is typically computed for traffic flows, individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each arriving scheduled flight: – Scheduled time of arrival (STA) or Scheduled in-block time (SIBT) – Actual in-block time (AIBT)	Schedule database(s), airports, airlines and/or ANSPs
KPI15	Flight time variability	Distribution of the flight (phase) duration around the average value.	Minutes/flight	The KPI is typically computed for the scheduled traffic flows interconnecting a given cluster of airports (two or more; selection/grouping based on size and/or geography).	For each flight: – OOOI data: gate "out" (AOBT), wheels "off," wheels "on," and gate "in" (AIBT) actual times.	Airlines

#	Title	Definition	Measurement Units	Objects Characterized	Data Requirement	Data Feed Providers
KPI16	Additional fuel burn	Additional flight time/distance and vertical flight inefficiency converted to estimated additional fuel burn attributable to ATM	kg fuel/flight	This KPI is a conversion of the additional flight time/distance and vertical flight inefficiency KPIs to a corresponding (estimated) additional fuel consumption; hence it describes a performance characteristic of the same objects as the additional flight time/distance and vertical flight inefficiency KPIs: en-route airspace, terminal airspace and airports. Typically the KPI is published at the level of a State or (sub)region.	Indicator values to be converted to estimated additional fuel burn: – KPI02 Taxi-Out Additional Time (min/flight) – KPI13 Taxi-In Additional Time (min/flight) – KPI05 Actual en-Route Extension (%) & average en-route distance flown (km/flight) – KPI08 Additional time in terminal airspace (min/flight) – KPI17 Level-off during climb – KPI18 Level capping during cruise & average cruise (ToC-ToD) distance flown (km/flight) – KPI19 Level-off during descent	Performance analysts
KPI17	Level-off during climb	Distance and time flown in level flight before Top of Climb.	NM/flight and minutes/flight	The KPI is typically computed for traffic flows, individual airports, or clusters of airports (selection/grouping based on size and/or geography).	– For each flight trajectory: – 4D data points (latitude, longitude, altitude and time) – Departure airport ARP coordinates –	Trajectory data providers (reporting archived actual trajectories based on ADS-B and/or other surveillance data sources) and/or ANSPs.
KPI18	Level capping during cruise	Flight Level difference between maximum Flight Levels on a measured airport pair and maximum Flight Levels on similar unconstrained airport pairs.	Flight Levels/flight	The KPI is typically computed for traffic flows on individual airport pairs or groups of airport pairs (weighted average).	For each flight trajectory: – Maximum cruise Flight Level – Departure airport – Arrival airport	For variant 1: ANSPs; For variant 2: Trajectory data providers (reporting archived actual trajectories based on ADS-B and/or other surveillance data sources) and/or ANSPs

#	Title	Definition	Measurement Units	Objects Characterized	Data Requirement	Data Feed Providers
KPI19	Lev Level-off during descentel capping during cruise	Distance and time flown in level flight after Top of Descent.	NM/flight and minutes/flight	The KPI is typically computed for traffic flows, individual airports, or clusters of airports (selection/grouping based on size and/or geography).	For each flight trajectory: – 4D data points (latitude, longitude, altitude and time) – Arrival airport ARP coordinates	Trajectory data providers (reporting archived actual trajectories based on ADS-B and/or other surveillance data sources) and/or ANSPs.

PERFORMANCE BASED NAVIGATION SUB-GROUP
(PBN SG)

1.   Terms of Reference

1.1   The terms of reference of the PBN Sub-Group are:

a) ensure that the implementation of PBN in the MID Region is coherent and compatible with developments in adjacent regions, and is in line with the Global Air Navigation Plan (GANP), the Aviation System Block Upgrades (ASBU) methodology and the MID Region Air Navigation Strategy;

b) monitor the status of implementation of the MID Region PBN-related ASBU ~~Modules~~ threads/elements included in the MID Region Air Navigation Strategy as well as other required PBN supporting infrastructure, identify the associated difficulties and deficiencies and provide progress reports, as required;

c) keep under review the MID Region PBN performance objectives/priorities, develop action plans to achieve the agreed performance targets and propose changes to the MID Region PBN plans/priorities, ~~through the ANSIG,~~ as appropriate;

d) seek to achieve common understanding and support from all stakeholders involved in or affected by the PBN and GNSS developments/activities in the MID Region;

e) provide a platform for harmonization of developments and deployments of PBN concentrating on PBN for approach and terminal areas;

f) monitor and review the latest developments in the area of PBN and procedure design, provide expert inputs for PBN-related issues; and propose solutions for meeting ATM operational requirements;

g) monitor and review the latest GNSS developments and activities;

h) ~~carry out necessary studies for the establishment of a MID Flight Procedure Programme Office;~~

~~i)~~h) provide regular progress reports to ~~the ANSIG and~~ MIDANPIRG concerning its work programme; and

~~j)~~i) review periodically its Terms of Reference and propose amendments, as necessary.

1.2   In order to meet the Terms of Reference, the PBN Sub-Group shall:

a) provide necessary assistance and guidance to States to ensure harmonization and interoperability in line with the GANP, the MID ANP and ASBU methodology;

b) provide necessary inputs to the MID Air Navigation Strategy through the monitoring of the agreed Key Performance Indicators related to PBN;

c) identify and review those specific deficiencies and problems that constitute major obstacles to the provision of efficient PBN implementations, and recommend necessary remedial actions;

d) develop and lead the work programme of the MID PBN Support Team (MPST) including the conduct of MPST visits;

e) assist States that may require support in the implementation of PBN, through MPST support teams;

f)d) conduct study related to the establishment of review and support the MID Flight Procedure Programme officeactivities, as required, including coordination of capacity building activities related to training and qualification of the procedure design personnel and all other personnel involved in PBN implementation;

g)e)monitor the progress of studies, projects, trials and demonstrations by the MID Region States, and other ICAO Regions in PBN and GNSS;

h) coordinate with the CNS SG to study the requirements for GNSS Augmentation Systems in the MID Region, and develop implementation plans; and

f) foster the implementation of PBN through proper training and qualification of the procedure design personnel and all other personnel involved in PBN implementation.

i)g) Coordinate with relevant MIDANPIRG and RASG-MID Subsidiary bodies issues with common interests.

2.   COMPOSITION

2.1   The Sub-Group is composed of:

a) MIDANPIRG Member States;

b) concerned International and Regional Organizations as observers; and

c) other representatives from provider States and Industry may be invited on ad hoc basis, as observers, when required.

3.   WORKING ARRANGEMENTS

1. The Chairperson, in close co-operation with the Secretary, shall make all necessary arrangements for the most efficient working of the Subgroup. The Subgroup shall at all times conduct its activities in the most efficient manner possible with a minimum of formality and paper work (paperless meetings). Permanent contact shall be maintained between the Chairperson, Secretary and Members of the Subgroup to advance the work.

Best advantage should be taken of modern communications facilities, particularly video-conferencing (Virtual Meetings) and e-mails.

2.   Face-to-face meetings will be conducted when it is necessary to do so.

ATTACHMENT A

PBN SG/5 VIRTUAL MEETING

(19 – 20 October 2020 from 10:00 to 12:00 UTC)

List of Participants

State/ Org	Contact	Title
Bahrain	Mr. Abdulla Hasan Al Qadhi	Chief, Aeronautical Information & Airspace Planning
	Mr. Ahmed Yousif Al Malki	Supervisor, Air Traffic Operations
	Mr. Ali Jaffar Ali	Under Training Supervisor, Air Traffic Operations
	Mr. Ahmed Ali Al Rowaie	Under Training Supervisor, Air Traffic Operations
	Mr. Isa Mohamed Al Khamiri	
	Mr. Ahmed M. Al Shamley	
Egypt	Mr. Tayseer Mohamed Abdel Kareem	ATS General Manager
	Ms. Aya Ashraf Mostafa	ANS Inspector
	Mr. Amr Ibrahim Abdel Latiff	ANS Inspector
	Mr. Ahmed Saied Abdel Monsef	Senior ANS Safety Oversight Inspector
	Mr. Ahmed Abdelwahab M. El Morady	Senior ANS/ATM Inspector
	Mr. Ehab Raslan Mohamed	G.M of R&D
	Ms. Asmaa Ahmed Atiya	R&D specialist at R&D directorate
	Mr. Walid Said Rawash	R&D specialist at R&D directorate
	Mr. Ahmed Sami Nazir	Director of charts & instrument procedure designer
	Mr. Mamdouh Hassan Abdel-Mohsen	Director of En-route charts
	Mr. Wael Abdel Ghafar Ibrahim	AIS officer
	Mr. Mohamed Ezzat Abd ElHady	ATCO
	Mr. Ahmed Abdel Azim Ammar	OJT manager Cairo tower & approach
	Mr. Mohamed Nabil Ibrahim	ATCO
	Mr. Mohamed Zakariya Elsayed	ATCO
	Mr. Amr Ibrahim	
Iran	Mr. Parto Kaveh	Senior Expert of Radio Navigation Aids
	Mr. Mohsen Kazemi	Deputy of CNS Department
	Mr. Mohsen Saadatpour	Flight Procedure Design Office Chief
	Mr. Ghasem Rahmani	ANS Expert
Iraq	Mr. Ali Waleed	AIS-HQ Manager
Jordan	Mr. Ahmad Yousef Alrefai	Aerodrome Safety Inspector
	Mr. Ahmad A. Al-Natour	Air Navigation Safety & Standards Inspector
	Mr. Mohammed Ali ALmomani	Chief of Safety & Standards ATM
Kuwait	Mr. Aqeel Hassan Mohammed	Electronic Supervisor-NED/DEP

State/ Org	Contact	Title
	Mr. Ahmad M. Butaiban	Head of ACC and APP Division
Lebanon	Mr. Bassem Nasser	Chief AIS Lebanon
Oman	Mr. Nasser Salim Al Mazroui	
	Mr. Hamad Mohammad Al Affani	
	Mr. Hamood Salim Al Zakwani	
	Mr Saif Saif Al Kiyoumi	
	Mr. Yusuf Moosa Al Raisi	
	Mr. Abdulla Said Al Hassani	
	Mr. Khamis Sulaiman Al Qasmi	
	Mr. Nasser Salim Al Tuwaiya	
	Mr. Nabeel Saleh Al Jahdhami	
	Mr.Khamis Rashid Al Rubkhi	
	Mr. Hamad Mohammad Al Araimi	
	Mr. Ahmad Abdullah Al Farsi	
	Mr. Yousuf Sulaiman Al Amri	
	Mr. Abdullah Juma Al Hudeifi	
	Mr. Mohammad Soud Al Mahrooqi	
	Mr. Yusuf Mohammad Al Zidjali	
	Mr. Amjad Abdullah Al Hassani	
	Mr. Alawi Abdulla Al Busaidi	
	Mr. Khamis Masoud Al Zidjali	
	Mr. Hamad Said Al Hosni	
	Mr. Abdullah Al Harthi	
	Mr. Sulaiman Al Salmi	
	Mr. Saud Al Sharji	
Qatar	Mr. Ahmed Al-Eshaq	Director Air Navigation
	Mr. Ramy Saad	ANS Inspector
	Mr. Antonio Cardoso	ANS Inspector

State/ Org	Contact	Title
Saudi Arabia	Mr. Khaled Saeed Hashlan	General Manager, Aviation Information Standards
	Mr. Anas Ibrahim Fallatah	Aviation Information Standards
	Mr. Imed ben Saad	AFP and AIM Expert
	Mr. Ibrahim S. Al Shaya	Aeronautical Charts Supervisor
	Mr. Mohammed Hassan Khalifah	Flight Procedure Design Inspector
	Mr. Mohammad Aljuhani	Instrument Flight Procedure Design
UAE	Mr. Muayyed Al Teneiji	Director Air Traffic Management
	Mr. Ahmed Saleh Al Shehhi	Senior Airspace coordinator
	Mr. Maram Khaled Ali Abdulkareem	AIM Publication Officer
USA (FAA)	Mr. Robert Roxbrough	Senior Representative – Abu Dhabi
ACAO	Mr. Mohamed Rejeb	Air Navigation and Air Safety Expert
CANSO	Mr, Dieter Guenter	Tetra Tech SVP Aerospace
	Mike Hornby	Manager, Operational Concepts ATM Strategy & Service Design
IATA	Ms. Zainab Khudhair	Manager Safety and Flight Operations
JEPPESEN	Mr. Volker Meyer	Manager International Relations
ICAO	Mr. Mohamed Smaoui	Acting Regional Director
	Mrs. Muna Alnadaf	RO/CNS
	Mr. Mohamed Iheb Hamdi	RO/AGA
	Mr. Radhouan Aissaoui	RO/IM
	Mr. Ahmed Amireh	RO/ATM/SAR
	Mr. Ahmad Kavehfirouz	RO/ATM/SAR
	Mrs. Manal Wissa	Programme Analysis Associate

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