

*International Civil Aviation Organization*



ICAO

**WORKING PAPER (WP/06)**

**ICAO Asia and Pacific (APAC)**

**Fourteenth Meeting of the Meteorological Requirements  
Working Group (MET/R WG/14)**

Bangkok, Thailand, 28 April to 2 May 2025

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**Agenda Item 2: Review outcomes of related meetings**

**MET INFORMATION NEEDED TO SUPPORT THE ELEMENTS OF THE APAC  
SEAMLESS ANS PLAN**

(Presented by MET/R WG Ad-hoc Group)

**SUMMARY**

This paper presents the updates in MET requirements to support the elements of APAC Seamless ANS Plan for discussion and invites the meeting to consider the proposal to integrate the information into existing APAC Seamless ANS Plan as an appendix for better information management.

**1. INTRODUCTION**

1.1 Meteorological (MET) information continues to be one of the key enablers to support safe and efficient air traffic. With the expected growth in air traffic, the integration of MET and Air Traffic Management (ATM) has therefore become increasingly important to ensure operational efficiency and to develop optimised decision support tools.

1.2 An ad-hoc group comprising of Australia, China, Hong Kong China, Japan, Singapore (rapporteur), and Thailand was formed to analyse the MET information/services required to support the APAC Seamless ANS Plan (ASAP) under the Deliverable 2<sup>1</sup> of the MET/R WG work plan. The ad-hoc group has completed and presented the analysis to ATM SG/5. This Deliverable remained in the MET/R WG workplan, pending any further work (which would be advised by ATM/SG and MET SG).

1.3 In 2024, the ad-hoc group further developed the analysis, in consideration of the updates in Global Air Navigation Plan (GANP) 2019 and ASAP. The analysis, which included a mapping document, was presented during the joint plenary session of MET/R WG/13 and ATFM/SG/14. The Meeting noted on the benefit of the mapping document as an appendix to the ASAP and requested the Secretariat to publish the document accordingly.

1.4 This paper presents additional analysis and include updates to the MET information/services required to support the elements of ASAP for review.

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<sup>1</sup> Deliverable 2: *Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ANS Plan*

## **2. DISCUSSION**

2.1 The ASAP was developed with references to the Global Air Navigation Plan (GANP, ICAO Doc 9750), Global ATM Operational Concept (ICAO Doc 9854) and Global Aviation Safety Plan (GASP). Together with other regional materials, it provides a reference to regional planning to facilitate APAC Seamless ANS operations. The ASAP is expected to be implemented in several phases.

2.2 The ASAP included the Aviation System Block Upgrade (ASBU) and regional elements as part of its foundation. These elements are prioritised in accordance with the definition in the Appendix A. The MET information/services required to support the ASAP could then naturally be identified from these elements. In consideration of the discussions in MET/R WG/13, the ad-hoc group has further analysed and included the mapping<sup>2</sup> of ASBU AMET elements required to support Priority 2 elements of the ASAP. The updated mapping is shown in Appendix B. With the focus on requirements (Priority 1 ASAP elements) to bring most benefit to the regional and to achieve ANS required globally, it is sufficient to implement AMET-B0/1-4<sup>3</sup> within ASBU. On the other hand, for recommended technological upgrades and supporting FF-ICE services, AMET-B1/1-4, AMET-B2/1-2 and AMET-B2/4 would be required.

2.3 The ad-hoc group proposed to include the updated mapping as an appendix to ASAP as discussed during the joint plenary session of MET/R WG/13 and ATFM/SG/14. This helps to limit the number of regional guidance material, leading to better information management that is less confusing and tedious for the users to keep abreast of the development in the region.

## **3. CONCLUSION**

3.1 Priority 1 and 2 ASAP elements are the critical and recommended upgrades that would bring potential benefits to the region. The analysis showed that AMET-B0/1-4, AMET-B1/1-4, AMET-B2/1-2 and AMET-B2/4 are required to support these elements.

## **4. ACTION BY THE MEETING**

4.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) consider the proposal in paragraph 2.3; and
- c) consider Deliverable 2 as completed; and
- d) discuss any relevant matters as appropriate.

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<sup>2</sup> The mapping is done based on the current version of ASBU (1<sup>st</sup> version) and ASAP (4<sup>th</sup> version)

<sup>3</sup> Refer to ASBU AMET elements and GANP for more information.

## **APPENDIX A**

Based on Paragraph 5.5. of ASAP, the elements are prioritised according to the following definition:

- Priority 1: critical upgrade assignment based on whether the implementation of an element could bring most benefit to the region or regional upgrade by States and is essential to achieve the service level required globally;
- Priority 2: recommended upgrade for those elements which would bring benefits to the region and generally to be implemented from 2022, but States are encouraged to implement earlier if beneficial; and
- Priority 3: assigned to those elements which may not be universally implemented in the Asia/Pacific Region.

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**APPENDIX B**

Based on the paragraph on PERFORMANCE IMPROVEMENT PLAN, ASAP, the elements of ASAP are implemented in phases of *Preferred Aerodrome/Airspace and Route Specifications* (PARS) and *Preferred ANS Service Levels* (PASL), and the phases are:

- Phase II - expected implementation by 07 November 2019;
- Phase III - expected implementation by 03 November 2022;
- Phase IV - expected implementation by 27 November 2025; and
- Phase V - expected implementation by 23 November 2028;

Note:

1. Phase I – elements (expected implementation by November 2015) that had not been completed by November 2019 were moved to Phase II.
2. Phases II and III are retained due to delayed availability of the implementation reporting mechanism following the update in 2019, and taking into consideration of the impact of COVID-19 pandemic.

Mapping of Priority 1 Elements of ASAP to ASBU elements under AMET:

<b>ASAP Elements (Priority 1)</b>	<b>Description</b> (paragraph on PERFORMANCE IMPROVEMENT PLAN, ASAP)	<b>ASBU Element</b>	<b>Required ASBU AMET Element</b>	<b>Implementation Phase</b>
Aeronautical Meteorology	Meteorological observations, forecast, warning, climatological and historical products, and dissemination (PASL 7.44)	AMET	AMET-B0/1 – 4	PASL Phase II
Aeronautical Information Management	Provision of quality-assured digital aeronautical data and information, including AIP, terrain and obstacle, aerodrome and instrument flight procedure data sets (PASL 7.43)	DAIM-B1/1 – 6	N.A	PASL Phase II
Airport CDM	Airport CDM Information Sharing, ACIS (PARS 7.3, 7.18)	ACDM-B0/1	AMET-B0/1 – 2	PARS Phase II and III
ANSP human and simulator performance (Regional)	(PASL 7.46)	Nil	N.A	PASL Phase II
ATS Inter-facility Datalink Communications	Automated basic AIDC (PASL 7.29)	FICE-B0/1	N.A	PASL Phase II
Space Object launches and re-entry management (Regional)	(PASL 7.48)	Nil	N.A	PASL Phase II

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<b>ASAP Elements (Priority 1)</b>	<b>Description</b> (paragraph on PERFORMANCE IMPROVEMENT PLAN, ASAP)	<b>ASBU Element</b>	<b>Required ASBU AMET Element</b>	<b>Implementation Phase</b>
Civil-Military Special Use Airspace (SUA) management (Regional)	(PARS 7.16)	Nil	N.A	PARS Phase II
Civil-Military strategic and tactical coordination (Regional)	(PASL 7.47)	Nil	N.A	PASL Phase II
Core data communications	VDL Mode O/A, AMHS (PASL 7.28)	COMI-B0/3, 7	N.A	PASL Phase II
	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS) (PARS 7.21, PASL 7.56)	COMI-B1/1	N.A	PARS Phase III PASL Phase III
Direct and Free Route Operations	Direct routing, Airspace Planning and FUA, Flexible Routings, and basic conflict detection and conformance monitoring (PASL 7.32, 7.34, 7.39)	FRTO-B0/1 – 4	AMET-B0/1, 2 and 4	PASL Phase II
Enhanced SAR systems (Regional)	(PASL 7.45)	GADS-B1/1 – 2	N.A	PASL Phase II
Ground-based Surveillance	ADS-B, MLAT, SSR-DAPS (PARS 7.8, 7.9, 7.11, 7.12, PASL 7.30, 7.31, 7.33)	ASUR-B0/1 – 3	N.A	PARS Phase II PASL Phase II
Network Operations	Initial integration of ASM with ATFM, Collaborative Network Flight Updates, Basic Network Operation Planning and Initial Airport/ATFM slots, A-CDM Network Interface and Dynamic Slot Allocation (PASL 7.41)	NOPS-B0/1 – 5	AMET-B0/1 – 3	PASL Phase II
Performance-based Navigation Approach Procedures	PBN non-precision approaches (with basic capability) (PARS 7.4, 7.5, 7.10, 7.13, 7.14, 7.21)	APTA-B0/1	AMET-B0/1 – 2	PARS Phase II
	Basic PBN SID and STAR procedures (with basic capability) (PARS 7.4, 7.5, 7.10, 7.13, 7.14, 7.21)	APTA-B0/2	AMET-B0/1 – 2	PARS Phase II
Runway Sequencing	Arrival and Departure Management (PASL 7.35)	RSEQ-B0/1 – 2	AMET-B0/1 – 2	PASL Phase II
Safety Nets	STCA, MSAW, APW, APM (PASL 7.34)	SNET-B0/1 – 4	N.A	PASL Phase II

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Mapping of Priority 2 Elements of ASAP to ASBU elements under AMET:

<b>ASAP Elements (Priority 2)</b>	<b>Description</b> (paragraph on PERFORMANCE IMPROVEMENT PLAN, ASAP)	<b>ASBU Element</b>	<b>Required ASBU AMET Element</b>	<b>Implementation Phase</b>
Adjacent ATS sector coordination (regional)	(PASL 7.27)	Nil	N.A.	PASL Phase II
ADS-B, SSR Mode S and PBN Airspace (regional)	(PARS 7.8, 7.9, 7.10)	ASUR-B0/1, B0/3 APTA-B0/1 – 3, B0/6	AMET-B0/1 – 2	PARS Phase II
Aeronautical Meteorology	Meteorological products supported by automated decision systems or aids using IWXXM (PASL 7.59, 7.61)	AMET-B1/1 – 4	AMET-B1/1 – 4	PASL Phase III & IV
Aeronautical Information Management	Provision of digital NOTAM improvements (PASL 7.58)	DAIM-B1/7	N.A.	PASL Phase III
Aerodrome management and coordination (regional)	(PARS 7.1)	Nil	N.A.	PARS Phase II
Aerodrome operations tools	Basic ATC surface operations tools, comprehensive situational awareness, situational awareness and alerting service (PASL 7.50)	SURF-B0/1 – 3	N.A.	PASL Phase III
	Advanced surface traffic management visual aids, pilot comprehensive awareness and runway alerting, enhanced ATC alerting, routing service to support ATC and EVS for taxiing (PASL 7.51)	SURF-B1/1 – 5	AMET-B0/1	PASL Phase III
Airport CDM	Airport CDM integration with ATM Network (PARS 7.3, 7.18)	ACDM-B0/2	N.A.	PARS Phase II & III
	Airport CDM Integration with ATM Network, AOP and APOC (PARS 7.25)	ACDM-B1/1 – 2	AMET-B1/1 – 2	PARS Phase V
Airspace classification (regional)	(PASL 7.36)	Nil	N.A.	PASL Phase II
ATC horizontal separation	(PASL 7.37)	Nil	N.A.	PASL Phase II

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ASAP Elements (Priority 2)	Description (paragraph on PERFORMANCE IMPROVEMENT PLAN, ASAP)	ASBU Element	Required ASBU AMET Element	Implementation Phase
(regional)				
ATC sector capacity (regional)	(PASL 7.40)	Nil	N.A.	PASL Phase II
ATS surveillance data sharing (regional)	(PASL 7.31)	ASUR-B0/1 – 2	N.A.	PASL Phase II
Civil-Military common procedures and training (regional)	(PASL 7.47)	Nil	N.A.	PASL Phase II
Civil-Military integrated systems and facilities (regional)	(PASL 7.47)	Nil	N.A.	PASL Phase II
Controller-Pilot communication Direct	CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace and ADS-C (FANS 1/A) for procedural airspace (PASL 7.56)	COMS-B0/1 – 2	N.A.	PASL Phase III
	PBCS approved CPDLC (FANS 1/A+), ADS-C and SATVOICE for domestic and procedural airspace (PASL 7.56)	COMS-B1/1 – 3	N.A.	PASL Phase III
Core data communication	ACARS, ATN/OSI, VDL Mode 2 Basic, SATCOM Class C Data, HFDL (PARS 7.21, PASL 7.56)	COMI-B0/1 – 2, B0/4 – 6	N.A.	PARS Phase III PASL Phase III
	VDL Mode 2 Multi-Frequency, SATCOM Class B (SB-S) Voice and Data, ATN/IPS and AeroMACS Ground-Ground (PASL 7.56)	COMI-B1/1 – 4	AMET-B1/1 – 2	PASL Phase III
Data-Link Departure Clearance (DCL) (regional)	(PASL 7.52)	Nil	N.A.	PASL Phase III
Direct and Free Route Operations	Free Route Airspace, RNP routes, Advanced FUA and Airspace Management (ASM), Dynamic Sectorisation, Enhanced Conflict Detection Tools and Conformance Monitoring, and Multi-Sector Planner Function (PASL 7.32, 7.54)	FRTO-B1/1 – 7	N.A.	PASL Phase II & III
Electronic Flight Progress Strips (regional)	(PASL 7.42)	Nil	N.A.	PASL Phase II

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<b>ASAP Elements (Priority 2)</b>	<b>Description</b> (paragraph on PERFORMANCE IMPROVEMENT PLAN, ASAP)	<b>ASBU Element</b>	<b>Required ASBU AMET Element</b>	<b>Implementation Phase</b>
Flight Level Allocation Schemes (FLAS) (regional)	(PASL 7.38)	Nil	N.A.	PASL Phase II
Flight Level Orientation Scheme (FLOS) (regional)	(PARS 7.15)	Nil	N.A.	PARS Phase II
Performance-based Navigation Approach Procedures	Basic airborne situational awareness AIRB and VSA, and performance-based horizontal separations (PARS 7.20)	CSEP-B1/1 – 4	N.A.	PARS Phase III
Navigation	SBAS, GBAS, ABAS, MON (PARS 7.5, 7.7)	NAVS-B0/1 – 4	N.A.	PARS Phase II
Network Operations	Short Term ATFM measures, Enhanced NOPS Planning, Enhanced integration of airport operations and NOPS planning, Enhanced Traffic Complexity Management, Full integration of ASM with ATFM, Initial Dynamic Airspace configurations, Enhanced ATFM slot swapping, Extended Arrival Management, ATFM Target Times and Collaborative Trajectory Options Programme (PASL 7.55)	NOPS-B1/1 – 10	AMET-B1/3	PASL Phase III
Runway Sequencing	Extended arrival metering (PASL 7.49)	RSEQ-B1/1	AMET-B1/1 – 2	PASL Phase III
Safety Nets	Enhanced STCA with aircraft parameters and in complex TMAs (PASL 7.53)	SNET-B1/1 – 2	N.A.	PASL Phase III
Space-based Surveillance	Reception of aircraft ADS-B signals from space (SB ADS-B) (PASL 7.57)	ASUR-B1/1	N.A.	PASL Phase III
SWIM services	Information service provision (PASL 7.62)	SWIM-B2/1	N.A.	PASL Phase IV
	Information service consumption (PASL 7.62)	SWIM B2/2	N.A.	PASL Phase IV
TBO	Introduction of time-based management within a flow centric approach (PASL 7.52)	TBO-B0/1	N.A.	PASL Phase III
	Initial Integration of time-based decision-making processes (PASL 7.55, 7.68)	TBO-B1/1	N.A.	PASL Phase III & IV
Terminal Area Operations	CDO (Basic) (PARS 7.14, 7.19, 7.21)	APTA-B0/4	AMET-B0/1 – 2	PARS Phase II & III
	CCO (Basic) (PARS 7.14, 7.19, 7.21)	APTA-B0/5	AMET-B0/1 – 2	PARS Phase II & III



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<b>ASAP Elements (Priority 2)</b>	<b>Description</b> (paragraph on PERFORMANCE IMPROVEMENT PLAN, ASAP)	<b>ASBU Element</b>	<b>Required ASBU AMET Element</b>	<b>Implementation Phase</b>
	Performance-based aerodrome operating minima for advanced aircraft (PARS 7.14, 7.19, 7.21)	APTA-B0/7	AMET-B0/1 – 2	PARS Phase II & III
	Performance-based aerodrome operating minima for basic aircraft (PARS 7.14, 7.19, 7.21)	APTA-B0/8	AMET-B0/1 – 2	PARS Phase II & III
Unmanned Aircraft Systems (regional)	(PARS 7.17)	Nil	N.A.	PARS Phase II
FF-ICE services	Filing Service (PASL 7.72)	FICE-B2/2	AMET-B2/1 – 2, B2/4	PASL Phase V
	Flight Data Request Service (PASL 7.72)	FICE-B2/4	N.A	PASL Phase V