

*International Civil Aviation Organization*



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**WORKING PAPER (WP/20)**

**ICAO Asia and Pacific (APAC)**  
Twenty-Eighth Meeting of the Meteorology Sub-Group  
(MET SG/28)

Bangkok, Thailand, 8 to 12 July 2024

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**Agenda Item 6: Research, development, and other initiatives**

**BUSINESS FUNCTIONALITY OF APAC COMMON SWIM INFORMATION SERVICES**

(Presented by SWIM TF Task Lead)

**SUMMARY**

This paper presents the updates on the work of ICAO APAC SWIM TF Task Team on Information Services to identify the business functionality to be supported by APAC Common SWIM Information Services for addressing the operational needs in APAC.

**1. INTRODUCTION**

1.1 According to the outcome of the APAC SWIM survey conducted in 2022, it was recommended to develop a list of the common set of SWIM information services for APAC. SWIM TF Task Team on Information Services undertook the work, in coordination with relevant subject matter experts, to identify the types of information to be exchanged via APAC SWIM and propose the necessary business functionality to be supported by APAC Common SWIM Information Services for addressing the operational needs in APAC.

**2. DISCUSSION**

2.1 A draft list of the business functionality of APAC Common SWIM Information Services was developed and introduced in SWIM TF/8 in November 2023 for review and comments:

- APAC Common SWIM Flight Information Services
- APAC Common SWIM Aeronautical Information Services
- APAC Common SWIM Meteorological Information Services
- APAC Common SWIM Surveillance Information Services

2.2 The following are the potential operational benefits if the aeronautical, flight, flow, meteorological and surveillance information could be exchanged in common digital format via APAC Common SWIM Information Services:

- Publish the changes in the status of flights, demands, airspace or MET constraints and other real-time updates to relevant stakeholders more efficiently
- Facilitate stakeholders to retrieve relevant tailored information automatically
- Allow operational users to have increased lead time to react in pre-departure phase (pre-tactical) and airborne phase (tactical)
- Increase users' situation awareness for better decision-making processes

- Enhance overall operational efficiency and reduce the impact to the ANSP, airspace users, passengers and other aviation stakeholders

2.3 To further refine the draft list of the initial set of APAC Common SWIM Information Services, an online voting was set up and promulgated to APAC States through State Letter to collect more comprehensive inputs and comments from related subject matter experts within APAC States during November to December 2023, particularly on:

- (i) the naming of the services,
- (ii) the message exchange patterns;
- (iii) whether the service should be considered as mandatory or optional in APAC SWIM; and
- (iv) other proposed common SWIM information services to be included in the list.

2.4 There were 59 responses from 18 States/Administrations, 2 airlines and the CRV provider received through the online survey. The results of the survey and the comments received are summarised in [SWIM TF/9 – WP/16](#).

2.5 Based on the survey responses from States, the proposed initial set of APAC Common SWIM Information Services was updated and presented to SWIM TF/9 in May 2024 for further review and discussion. The information services were considered a “higher priority” based on their ability to provide more significant initial operational benefits to the APAC Region. These services generally involve the exchange of information which is relatively more dynamic. The initial functionality of these information services with higher priority will focus on solving existing inefficiencies while maintaining interoperability with existing systems and services.

2.6 SWIM TF/9 suggested classifying priority of listed information services to three levels instead of two levels. It was agreed that an initial set of APAC Common SWIM Information Services will be identified in three priorities, i.e. priority (1), priority (2), and priority (3). The definition of the three-level priority was discussed and added in the initial set of APAC Common SWIM Information Services document:

- (1) Recommended for region-wide implementation for region-wide benefits
- (2) Recommended for implementation as much as practicable
- (3) Additional information services without common regional requirements and not included as a part of common regional information services

2.7 The list of recommended services in initial APAC Common SWIM Information Services was further reviewed and modified by SWIM TF/9, and the list updated by SWIM TF/9 is provided in **APPENDIX** of this paper. It was agreed that the SWIM TF Task Lead from Hong Kong China, together with relevant subject matter experts of SWIM TF, would present this updated version to the next meeting of AAITF, ATFM SG, FF-ICE Ad-hoc group, MET/IE WG, SURSG, MET SG, AOP SG, and ATM SG. All comments received from all proposed groups will be presented to SWIM TF/10.

2.8 It was agreed in SWIM TF/9 that that the information exchange model and its suitable version for each APAC Common SWIM Information service will be discussed and finalised by the subject-matter-expert contributory bodies, i.e. AAITF for AIXM, ATFM SG and FF-ICE Ad-hoc Group for FIXM, and MET/IE WG for IWXXM.

2.9 For the suggestion to incorporate the initial set of APAC Common SWIM Information Services into the initial version of the APAC SWIM Implementation Guidance Document, it was decided to add such information to the Document after the details of this initial APAC Common SWIM Information Service list is matured.

2.10 MET SG is invited to review the following items in the proposed initial set of APAC Common SWIM Aeronautical Information Services in **APPENDIX**, and provide comments.

- Business functionality of the service
- Brief description of the service
- Type of information to be exchanged
- Information exchange model or message type
- Message exchange pattern
- Priority as recommended service in initial APAC Common SWIM Information Services

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) review the proposed initial set of APAC Common SWIM MET Information Services in **APPENDIX** as mentioned in para. 2.10, and provide inputs or comments; and
- c) discuss any relevant matters as appropriate.

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**Proposed business functionality of APAC Common SWIM Information Services**  
**(Updated by SWIM TF/9)**

*(Editorial note – suggested changes made after SWIM TF/9 are indicated with ~~strikethrough~~ and **highlighted** text.)*

*Notes. – Recommended services in initial APAC Common SWIM Information Service (IS) ((1)/(2)/(3)):*

- (1) Recommended for region-wide implementation for region-wide benefits
- (2) Recommended for implementation as much as practicable
- (3) Additional information services without common regional requirements and not included as a part of common regional information services

<b>Business functionality of the service</b>	<b>Brief description of the service</b>	<b>Type of information to be exchanged</b>	<b>Information exchange model / Message type</b>	<b>Message exchange pattern</b>	<b>Recommended service in initial APAC Common SWIM IS (1) / (2) / (3)</b>
<b>APAC Common SWIM Aeronautical Information Services</b>					
Airspace management service	Exchanges of airspace status information between ASM Support System and Air Traffic Control (ATC) System. The sharing of airspace availability and airspace structure in real-time will contribute to a more efficient execution of the flight as information impacting the trajectory will be exchanged.	Airspace availability, restricted area, danger area, search and rescue regions	AIXM	Pub/Sub	2
Airspace feature service	Provides the characteristics of the three-dimensional airspace, described as horizontal projection with vertical limits, and their relevance to air traffic.	FIR/UIR boundaries, waypoints, enroute ATS routes, SIDs and STARs, navaids, procedures	AIXM	Pub/Sub or Req Reply	2
Aerodrome feature service	Provides current and/or planned airport layout features, such as aerodrome mapping data, runway, taxiway, passenger facilities.	Runways, movement areas, aerodrome services, navaids, instrument landing systems, Aerodrome location, communication facilities (frequencies)	AIXM	Pub/Sub	2

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Digital NOTAM distribution service	Provides aeronautical information in accordance with the Digital NOTAM Specification, such as runway closure.	Digital NOTAM (e.g. Special activity airspace (SAA) NOTAMs, or other types of NOTAMs)	AIXM	Pub/Sub	2
Runway Condition Report service	Provides runway surface conditions and contaminants (least to most slippery) that are directly correlated to aircraft take-off and landing performance.	Global Reporting Format (GRF) for runway surface conditions	AIXM	Pub/Sub or Req/Reply	2
ATIS distribution service	Provides continuous and automated broadcast of recorded aeronautical information in airport and terminal areas.	Current weather conditions, runway in use, available approaches, and other data relevant to arriving and departing aircraft, specific ATC procedures, and any airport construction activity that could affect taxi planning	TBD	Pub/Sub	2
Search and rescue service	Allows Rescue Coordination Centres (RCCs) to exchange information with neighbouring RCCs and ATS units for coordination during SAR operations.	Search and rescue regions, Registered aircraft operator details and contacts, ICAO Autonomous Distress Tracking (ADT) data, Location of Aircraft in Distress Repository (LADR) data, ICAO OPS CTRL database contact information, SAR Unit (SRU) location and capability data	TBD	Pub/Sub	3
<b>APAC Common SWIM Flight Information Services</b>					
GUFU service	GUFU (Globally Unique Flight Identifier) generation and provision	GUFU	FIXM	Req/Reply	1

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ATFM/A-CDM integrated service	Allows exchanges of flight plans and A-CDM milestone parameters among different stakeholders (such as arrival/departure ATFM units, airlines and airport operators) to connect A-CDM process to ATFM operations.	CTOT, CTO, TTOT, TSAT, etc.	FIXM	Pub/Sub	1
FF-ICE filing service	Provides a means to submit, update or cancel flight plans through a SWIM-based interface using FIXM.	Flight plan for registration, update or cancellation	FIXM	Req/Reply	1
FF-ICE data publication service	Provides harmonised sharing of flight plan information in a global standard supporting common situation awareness.	Flight plan for publication	FIXM	Pub/Sub	2
FF-ICE trial service	Allows operators to test the effect of a potential change in a flight plan prior to committing to the change.	Proposed changes in a flight plan	FIXM	Req/Reply	2
FF-ICE flight data request service	Allows an operator to request the current status of a flight plan, or an ANSP can request an operator to submit the latest version of their flight plan.	Current status of a flight plan	FIXM	Req/Reply	1
FF-ICE notification service	Provides notification of a change in flight state, such as Departure (DEP) and Arrival (ARR) Air Traffic Service (ATS) messages.	ARR, DEP messages	FIXM	Pub/Sub	1
FF-ICE planning service	Allows operators to submit flight plans for early Air Traffic Flow Management (ATFM) planning and to obtain feedback regarding restrictions/constraints affecting the flight.	Flight plan for early ATFM planning	FIXM	Req/Reply	2

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Traffic flow status service	Provides users with notification of any traffic flow management measures which are in affect and how they may affect their aircraft.	Demand and constraints, Miles-in-Trail (MIT), Minutes-in-Trail (MINIT), ATFM daily plan, Ground Delay Program (GDP)	TBD	Pub/Sub	2
<b>APAC Common SWIM Meteorological Information Services</b>					
<b>FOR AERODROME</b>					
METAR/SPECI information service	Provides of IWXXM-formatted METAR/SPECI product specified in ICAO Annex 3.	Provision of the existing product in Annex 3. Information service will be enabled through Amendment 81 to Annex 3 as recommended practice with applicability from Nov 2024.	IWXXM	Pub/Sub Req/Reply	1
TAF information service	Provides of IWXXM-formatted TAF product specified in ICAO Annex 3.		IWXXM	Pub/Sub Req/Reply	1
Aerodrome observation information service	Provides continuous observations of weather parameters at an aerodrome. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.	To be introduced as recommended practice in Annex 3 (Amd 83) in Nov 2027 tentatively	IWXXM	Pub/Sub or Req/Reply	2
Aerodrome forecast information service	Provides information of the expected meteorological conditions, including probability, at an airport during a specified period. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.	(Note: Level of standardisation needs to be considered, as different aerodrome information services may be required for different use cases.)	IWXXM	Pub/Sub or Req/Reply	2
<b>FOR ENROUTE</b>					
SIGMET information service	Provides of IWXXM-formatted SIGMET product specified in ICAO Annex 3.		IWXXM	Pub/Sub Req/Reply	1
AIRMET information service	Provides of IWXXM-formatted AIRMET product specified in ICAO Annex 3.		IWXXM	Pub/Sub Req/Reply	1

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Tropical Cyclone Advisory information service	Provides of IWXXM-formatted Tropical Cyclone Advisory product specified in ICAO Annex 3.  (Designated provider: States with Tropical Cyclone Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Volcanic Ash Advisory information service	Provides of IWXXM-formatted Volcanic Ash Advisory product specified in ICAO Annex 3.  (Designated provider: States with Volcanic Ash Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Space Weather Advisory information service	Provides of IWXXM-formatted Space Weather Advisory product specified in ICAO Annex 3.  (Designated provider: States with Space Weather Advisory Centre)		IWXXM	Pub/Sub Req/Reply	1
Observatory Notice for Aviation (VONA) information service	Provides of IWXXM-formatted VONA specified in ICAO Annex 3. Provision of VONA will become the recommended practice in Annex 3 in 2025.  (Designated provider: States with Volcano Observatory)		IWXXM	Pub/Sub Req/Reply	2
Quantitative volcanic ash (QVA) concentration information service	Provides detailed information of volcanic ash in the atmosphere, including probabilities of ash concentration thresholds over space and time. Advanced meteorological SWIM (MET-SWIM) service being developed by MET Panel.  (Designated provider: States with VAAC)	QVA grids point forecasts including probabilities, QVA objects. To be introduced as recommended practice in Annex 3 (Amd 82) in Nov 2025 tentatively	Gridded data (e.g. NetCDF), IWXXM	Pub/Sub or Req/Reply	1
WAFc (World Area Forecast Centres) grid point forecast	Provides global gridded weather forecasts.  (Designated provider: WAFcs (UK and US))	Global gridded forecasts of upper winds, upper-air temperatures and humidity, flight level and	Gridded data in GRIB	Pub/Sub or Req/Reply	1



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		temperature of tropopause, and direction, speed and flight level of maximum wind			
WAFC significant weather (SIGWX) forecast	Provides global WAFC SIGWX data sets with coverage expressed in polygons.  (Designated provider: WAFCs (UK and US))	Significant weather forecast such as tropical cyclone, severe squall lines, turbulence, icing, etc.	IWXXM	Pub/Sub or Req/Reply	1
Special Air Report (ARS)	Provides reports of special observations made by aircraft when they encounter special weather phenomena, such as moderate/severe turbulence or icing. (Note: Currently there is plan to implement this information service)	Special aircraft observations of weather phenomena as specified in Annex 3, including turbulence, icing, mountain wave, thunderstorms, duststorm, sandstorm, volcanic cloud, volcanic activity / eruption	TBD	Pub/Sub or Req/Reply	2
MET derived from Mode S DAPs	Provides upper air winds and temperatures derived from Mode S Downlinked Aircraft Parameters (DAPs) (e.g. true airspeed, ground speed, magnetic heading, true track angle) and facilitates exchange of derived winds and temperatures among MET service providers.	Upper air winds and temperatures derived from Mode S DAPS	TBD	Pub/Sub or Req/Reply	3
Satellite image service	Provides satellite observational information.	Satellite derived MET information (e.g. significant convection)	Gridded format (e.g. NetCDF) and image format	Req/Reply	2
Weather radar image service	Provides two- or three-dimensional radar observational information.	Weather radar reflectivity to visualise the intensity of convection	Gridded format (e.g. NetCDF) and image format	Req/Reply	2
APAC Common SWIM Surveillance Information Services					

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Surveillance data sharing service	Provides three-dimensional position, time and identification of aircraft and other data as appropriate.	Position, altitude, ground speed, track angle, call sign, Mode S address, data quality, Mode S DAP	ASTERIX Cat 21 (payload in JSON or RAW format)	Pub/Sub	2