ICAO CAPACITY & EFFICIENCY

APAC User Requirements for SWIM-Based MET Information Services Supporting ATFM

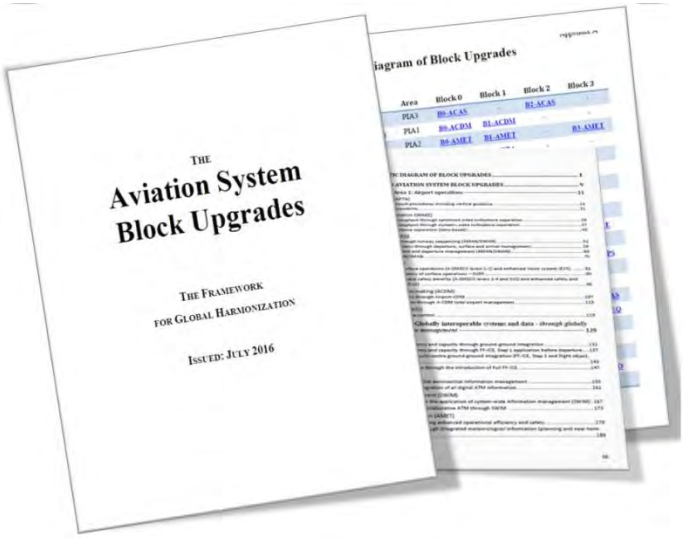
Presented by

Australia, Hong Kong China and Thailand

ICAO APAC ATFM SG/10
4-8 May 2020

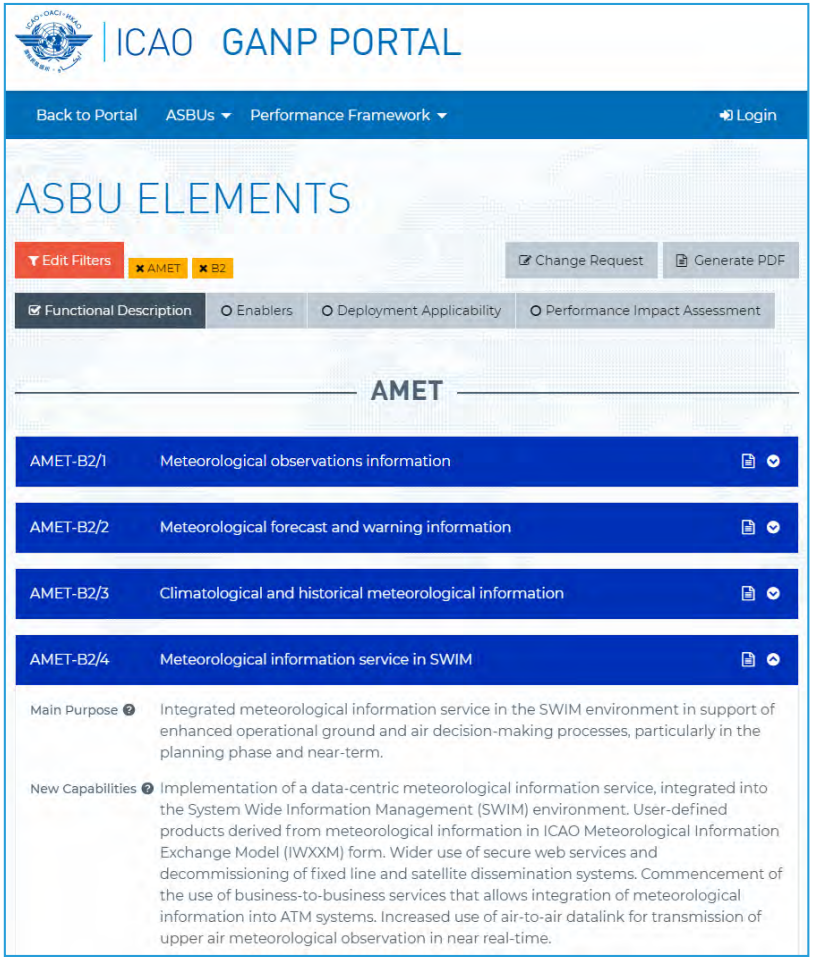
Introduction

- ASBU B1-SWIM (2019-2025)
  - improve current human-to-human communication with machine-to-machine interconnection
  - enhanced efficiency in data distribution and accessibility
  - global interoperability among aviation stakeholders.



Introduction

- Scope
  - all information concerning air navigation, including MET information
  - dissemination of MET information using MET information service in SWIM is included as part of AMET thread in ASBU



Outline

- Reviews the recent SWIM activities related to MET and ATM at global and regional levels
- Provides some examples of
  - SWIM-based MET information services; and
  - use cases for supporting ATFM
- Proposes to develop a regional document to capture the use cases and user requirements for SWIM-based MET information services to support ATFM

Recent SWIM activities related to MET/ATM

- ICAO Meteorology Panel (METP)
  - to define concepts for aeronautical MET service provision supporting the future globally interoperable air traffic management system through SWIM.
- MET-SWIM Plan being developed by METP WG-MIE outlines the concepts of
  - how MET information service can be discovered and
  - how MET information should be exchanged in the SWIM environment.

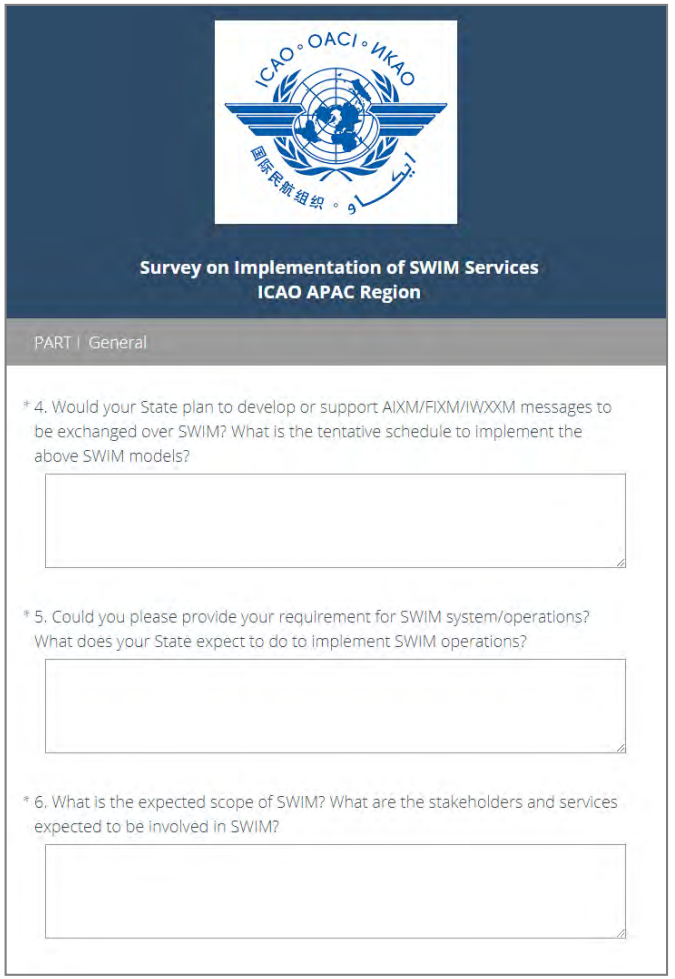

Plan for Meteorology in System Wide Information Management (SWIM)

First Edition — October 2018

International Civil Aviation Organization

Recent SWIM activities related to MET/ATM

- ICAO APAC SWIM TF established in 2017
  - to develop SWIM-related components and supporting materials required for regional implementation in region.
- APAC SWIM Survey results discussed in SWIM TF/3(May 2019)
  - identified cross-border ATFM as one of the most important operations which could be more efficiently conducted using SWIM.
  - agreed that the SWIM implementation to support cross-border ATFM operation should be given high priority.
  - not only the SWIM infrastructure services but also the information services required to support such operation,
  - Including information service providing MET information in IWXXM



Survey on Implementation of SWIM Services
ICAO APAC Region

PART I General

* 4. Would your State plan to develop or support AIXM/FIXM/IWXXM messages to be exchanged over SWIM? What is the tentative schedule to implement the above SWIM models?

* 5. Could you please provide your requirement for SWIM system/operations? What does your State expect to do to implement SWIM operations?

* 6. What is the expected scope of SWIM? What are the stakeholders and services expected to be involved in SWIM?

Recent SWIM activities related to MET/ATM

- SWIM in ASEAN Demonstration Project
  - successfully concluded in Nov 2019
  - include operations scenarios focusing on cross-border Distributed Multi-Nodal ATFM and A-CDM operations involving the handling of weather impact
  - to explore how MET information can be better distributed and integrated through the SWIM environment into end-user systems to support their pre-tactical and tactical decision making.

Recent ICAO APAC Updates

- **MET/R WG/8** discussed the proposal and recognized a need for a regional document for SWIM-based MET information services to support ATFM, in conjunction with relevant global documents.

- The proposal was further discussed at **MET SG/23** and the meeting requested for more mature terms of reference and adopted the following Decision:

Decision MET SG/23-7: Development of APAC User Requirements for SWIM-based MET Information Services Supporting ATFM

That, MET/R WG, in conjunction with the ATFM SG, establish an ad-hoc group to develop user cases and user requirements for future SWIM-based MET information services supporting ATFM.

Recent ICAO APAC Updates

- Following the discussion in MET SG/23, Australia, Hong Kong China and Thailand revised the proposal and presented it to ATM SG/7 in August 2019 for discussion by the ATM community.

  ATM SG/7 adopted the following action item in the ATM SG Task List:

ATM SG Action Item 7/7

Circulate an invitation to ATFM experts to support the proposal in the Decision by encouraging subject matter experts from ATFM/SG to participate in an ad-hoc group to develop use cases and user requirements for future SWIM-based MET information services supporting ATFM (in consultation with ATFM/SG Chair, notify ATFM/SG participants and request they engage/participate).

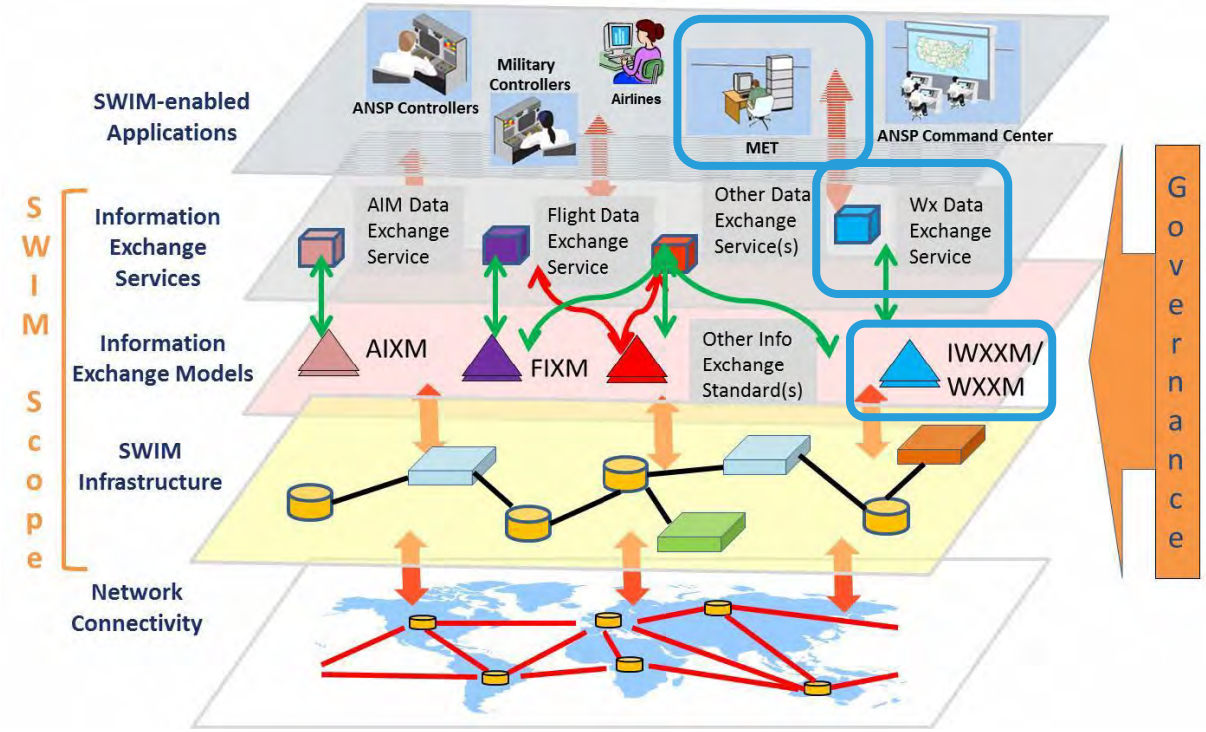
Proposed Terms of Reference

1. To focus on SWIM-based MET information services specifically addressing the needs of ATFM in the APAC Region;
2. To document user requirements and use cases from ATFM in the APAC Region to facilitate the development of future SWIM-based MET information services;
3. To supplement the global concept described in the MET-SWIM Plan prepared by the METP WG-MIE, and support the MET requirements being developed by the METP Working Group on Meteorological Requirements and Integration (WG-MRI) in a global sense and IWXXM development by METP WG-MIE for effective exchange of MET information supporting AFTM operation;
4. To assist SWIM TF in identifying and developing the specifications of information services required to support operations based on user needs;
5. To identify MET and ATFM data to be exchanged using SWIM-based Information Exchange Services (examples shown in Appendix B) to enable the effective MET/ATM integration and to provide the baseline for further development of the regional SWIM data catalogue and service catalogue; and
6. To identify other granular MET-related requirements from ATFM perspective such as update frequency and forecast lead time of MET information to better support the development of future MET Information Exchange Services.

SWIM-based MET Information Service and Examples of use cases to support ATFM

SWIM-based MET information services

– Requested information is consumed by SWIM-enabled Applications via Information Exchange Services to meet end-users needs.



SWIM Global Interoperability Framework

ICAO Manual on SWIM (Doc 10039)

SWIM-based MET Information Exchange Services

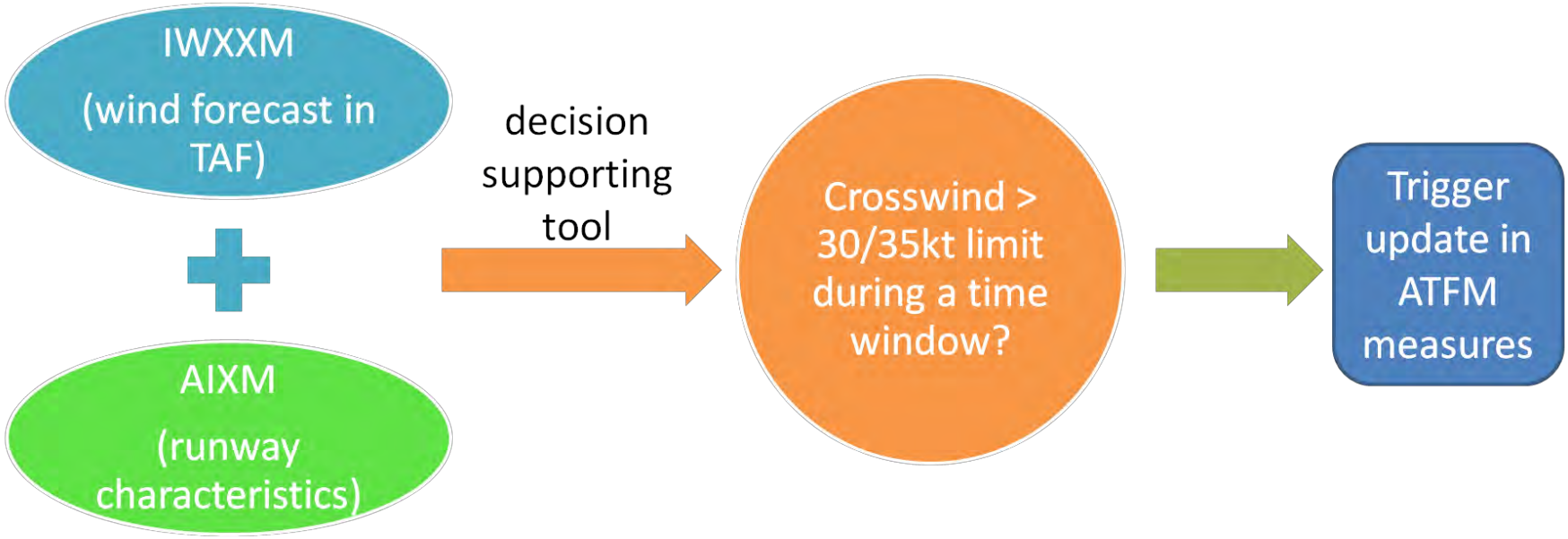
- capable to geospatially and/or temporally filter a data set to provide the users' system only the tailored information required by the user

Sample data to be exchanged via SWIM-based MET Information Exchange Services to support ATFM operations

Sample MET data catalogue	Sample ATFM data catalogue
Aerodrome • Surface wind and gust • Headwind • Windshear • Turbulence • Crosswind • QNH • Temperature and dew point • RVR • Visibility • Cloud amount and type • Lightning • Radar data • Wake vortex • Weather phenomenon and intensity Enroute • Wind • Temperature • CB clouds / deep convection area • Icing • Clear air turbulence • Tropopause height • SIGMET phenomenon and intensity • Volcanic ash cloud • Tropical cyclone • Satellite data	• Departure aerodrome • Destination aerodrome • Flight identification • Planned route/trajectory • Estimated Off-Block Time (EOBT) • Estimated Take-Off Time (ETOT) • Estimated Landing Time (ELDT) • Estimated Elapsed Time (EET) • Calculated Take-Off Time (CTOT) • Calculated Landing Time (CLDT) • Target Off-Block Time (TOBT) • Target Start Up Approval Time (TSAT) • Target Take-Off Time (TTOT) • Actual Off-Block Time (AOBT) • Estimated Time Over (ETO) • Calculated Time Over (CTO) • Actual Time Over (ATO)

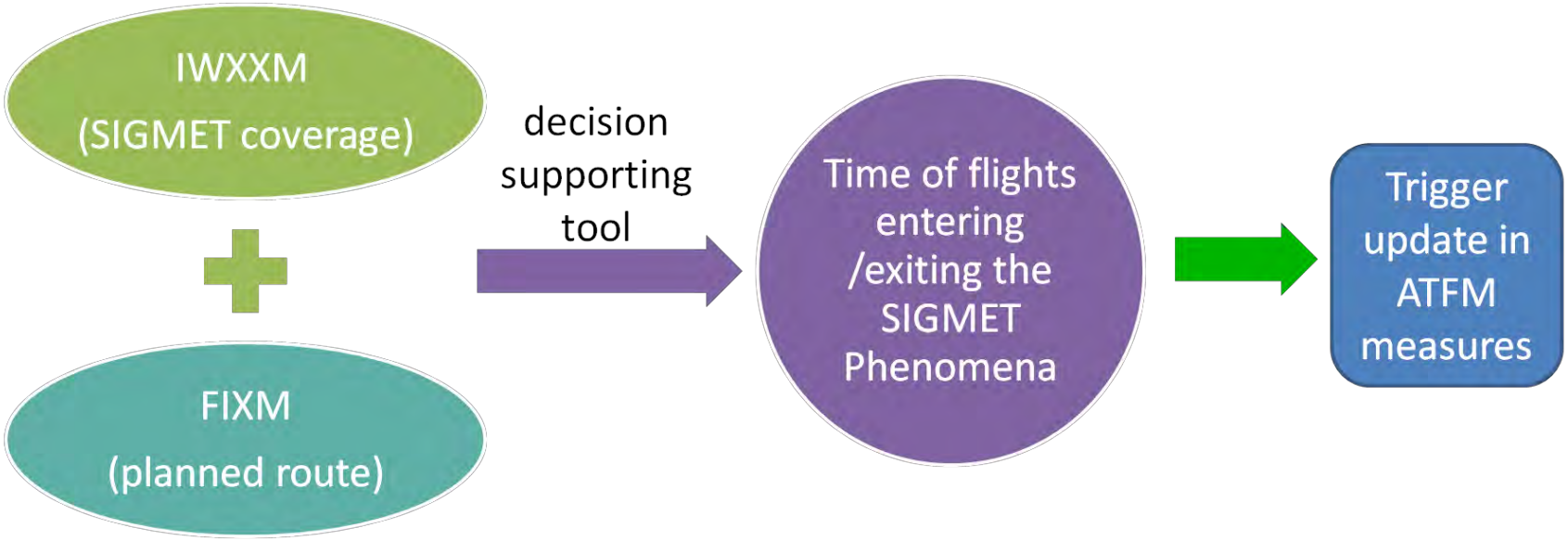
Examples of use cases for ATFM

- **Example 1**: Integration of MET information in IWXXM with aerodrome information in AIXM to assess the crosswind at destination within a requested time period



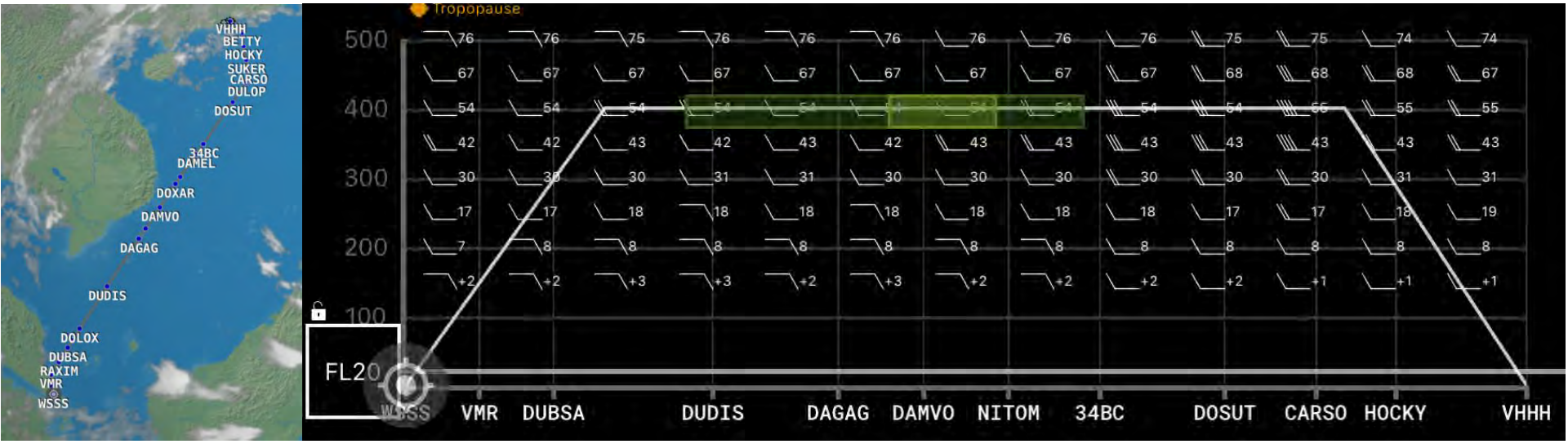
Examples of use cases for ATFM

- **Example 2**: Integration of MET information in IWXXM with flight information in (FIXM) to assess the number of flights crossing areas of significant weather phenomena mentioned in SIGMET reports (such as CBs and associated SEV TURB and SEV ICE) within a requested time period



Examples of use cases for ATFM

– **Example 3**: Vertical cross-section of forecast headwind wind along with merging arrival routes for estimation of any possible change in flow rate at a waypoint



Outcome from ATFM SG/10 (4-8 May 2020)

- The meeting reviewed the proposal, including the TOR, and did not propose any change.
- The meeting was also reminded of ATM/SG Action Item 7/7, relating to the circulation of an invitation to ATFM experts to support the proposal in the decision by encouraging subject matter experts to participate in the ad hoc group.
- Australia, Hong Kong China, Singapore, Thailand, CANSO and IATA indicated that they would participate in the ad-hoc group.

Action by the meeting

The meeting is invited to:

- encourage subject matter experts from both MET/R WG and ATFM/SG, to participate in an ad-hoc group and contribute to the development of use cases and user requirements for future SWIM-based MET information services supporting ATFM
- review and endorse the proposed Terms of Reference
- discuss future plans and any relevant matters as appropriate.

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THANK YOU