



Development of future aeronautical meteorological services to better meet ATM requirements

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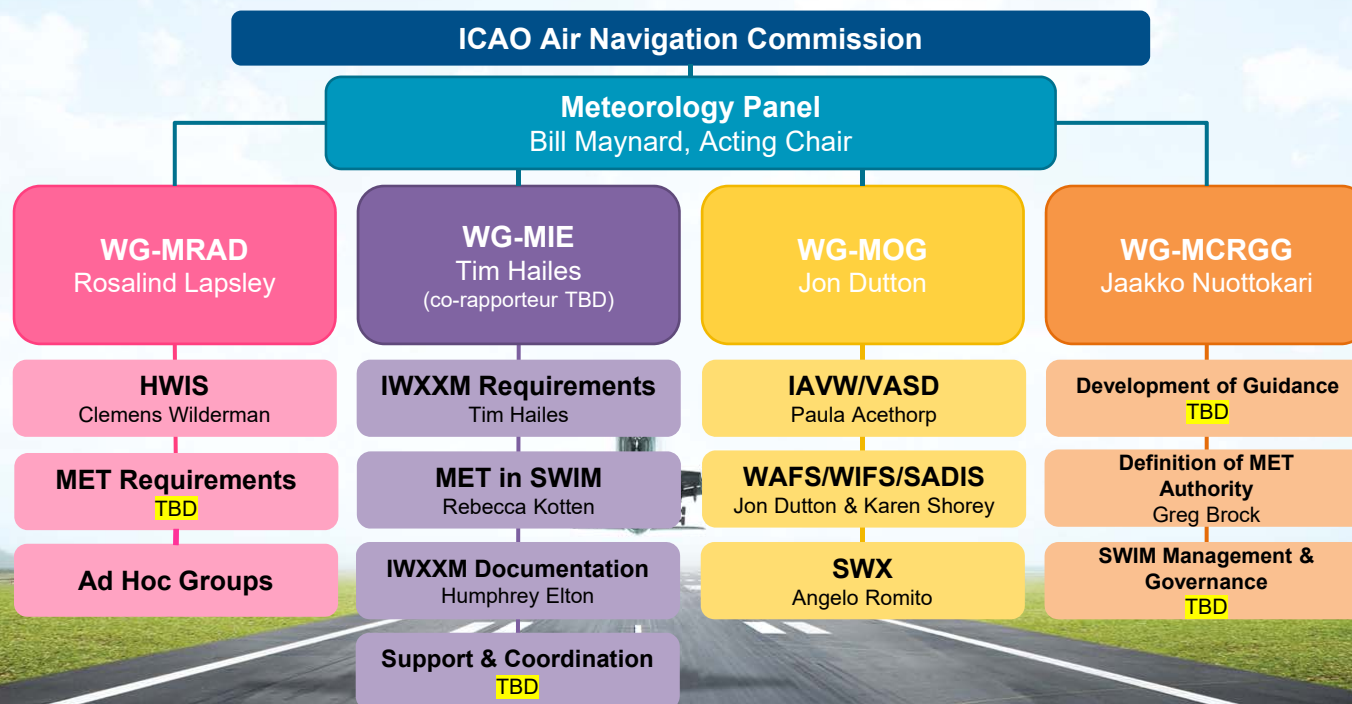


Meteorology Panel (METP)

- One of ANC Panel on aeronautical meteorology
 - Non-governmental expert Group to address specific issues and develop global standards
 - Consisting of 31 Member experts from 24 States/7 Organization plus Advisers (as of today)
- Key Areas of Work
 - Annex 3 and PANS-MET - development and implementation
 - Trajectory-based operations support / ASBU support
 - IWXXM and SWIM development and implementation
 - World Area Forecast system (WAFS) - further development
 - Space weather information service - implementation and further development
 - Volcanic ash information service - further development (IAVW)
 - Hazardous Weather information service - concepts and development of HWIS
 - Cost recovery and governance work – SWX cost recovery guidance, etc
 - MET Panel structural enhancement - closer co-operation and collaboration with WMO



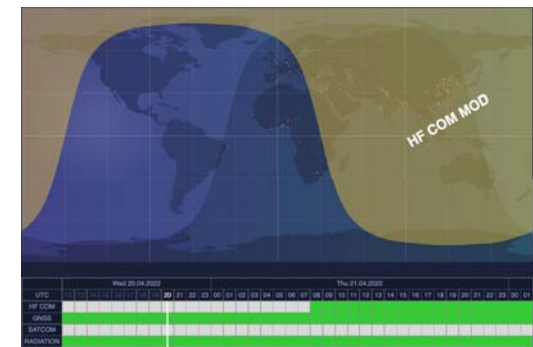
Current METP Working Group Structure (as of May 30, 2022)





Upcoming & Foreseen developments

- o Space weather information (started Nov. 2019)
- o Quantitative volcanic ash information (IOC, 2024)
- o Hazardous Weather Information Service (2026 *to be further developed)
- o Volcano Observatory Notice to Aviation (VONA) in TAC and/or IWXXM (2024)
- o World Area Forecast System (WAFS) upgrades
 - Higher resolution aviation hazards (2020)
 - High resolution data for all parameters (2024)
 - Introduction of probabilistic WAFS information (2026)
- o SADIS/WIFS accommodate IWXXM and Higher resolution data (2024)
- o API (Application Programming Interface) services to be available under SWIM environment



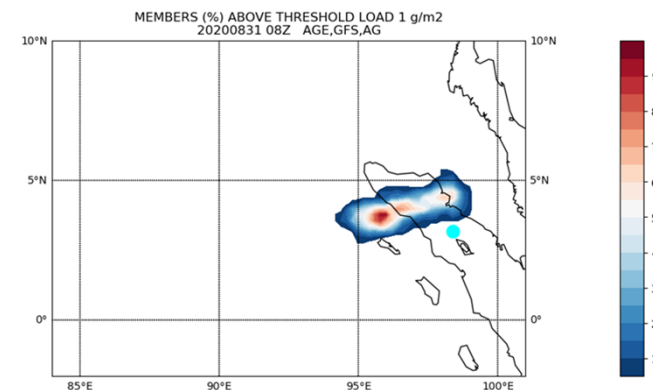


Quantitative Volcanic Ash (QVA) information

- o IAVW—9 Volcanic Ash Advisory Centres (VAACs) provides 24/7 monitoring/forecasting, issuing VAAs
 - in coordination with State Volcano Observatories (SVOs)
- o Aviation requirements for further development of QVA
 - Timely detections of eruptions/ash cloud
 - 4-d characteristics (x, y, z, t) of VA cloud
 - Amount of ash in cloud (quantitative)
 - Uncertainty information
- o QVA initial operational capability expected to be provided in 2024 (some VAACs)
 - To be extended to all VAACs in 2026
- o Challenges still exists
 - Further needs for more in-situ observations of ash amounts
 - Reduce uncertainties and variance of forecast results

Proposed Concentration Thresholds for Ash

Threshold	Ash Concentration range (mg / m ³)
Very Low	< 0.2
Low	0.2-2.0
Medium	2.0-5.0
High	5.0-10.0
Very High	> 10.0



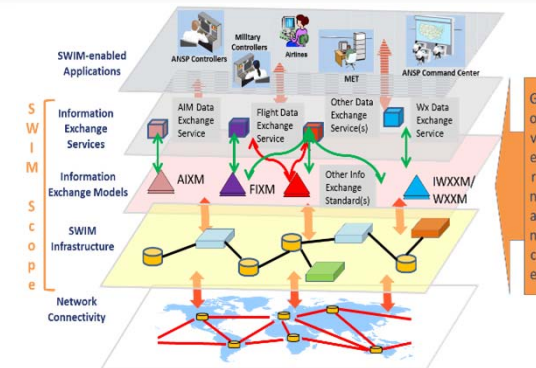


0	0	0	0	0	0	0	0	0
1	2	2	1	0	1	1	0	0
1	1	1	1	2	2	2	2	1
0	0	0	0	1	2	1	1	1
1	1	1	2	2	2	2	1	0
1	1	1	2	2	2	1	1	0
1	0	1	1	2	2	2	1	0



Digitalization of Meteorological information

- o IWXXM implementation has been promoted
 - Standard Practice implemented in November 2020
 - Regional Workshop/Webinar has been conducted
- o SWIM-based information services are expected to be implemented more widely
 - MET service provision transition from Product-Centric service to Information Service
- o MET information services via SWIM....
 - Remove of limitations from legacy TAC format by using IWXXM and grids
 - Allow further MET information exchange in IWXXM
 - Enable “fit-for-purpose” use/visualization of MET info





Evolution of global air navigation system and “MET”

- Migration from “product-centric” to “information-based” environment
 - Support global ATM as envisaged in ICAO GANP/ASBUs
- Future MET integration into ATM decision making to be developed
- Close coordination with ATM-related Panels (ATMRPP, ATMOPSP)

AMET Block 0:

Global, regional and local meteorological information to support flexible airspace management, improved situational awareness, collaborative decision-making and dynamically optimized flight trajectory planning.

AMET Block 1:

Meteorological information supporting automated decision process or aids, involving meteorological information, **meteorological information translation**, **ATM impact conversion** and ATM decision support.

AMET Block 4:

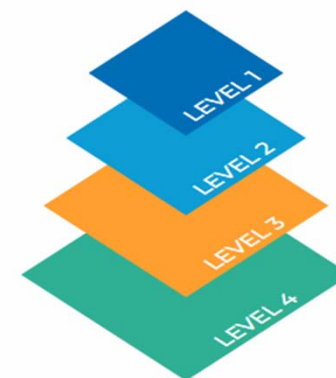
Integrated meteorological information supporting both air and ground decision making for all phases of flight and ATM operation, especially **for implementing immediate weather mitigation strategies**.

GLOBAL STRATEGIC

GLOBAL TECHNICAL

REGIONAL

NATIONAL



The sixth edition of Global Air Navigation Plan (GANP) can be found at: [Home - ICAO GANP Portal](#)



Future considerations

- Migration from product centric to information services
 - IWXXM/SWIM compatible services
- Integration of MET information into ATM decision making system
 - In coordination with other ATM-related Panels (ATMRPP, ATMOPSP)
- Addressing additional requirements for MET
 - Integrated MET information for aerodrome domain
 - Ultra long-haul/High altitude flight support
 - High altitude Ice Crystal information, Aircraft De-icing support
- Other foreseen requirements
 - Environmental affect may require further advanced meteorological information and services (to reduce significant phenomena impact on aviation)
 - RPAS (Remote Piloted Aircraft Systems) support to be considered





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