



**INTERNATIONAL CIVIL AVIATION ORGANISATION**  
**AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP (APIRG)**  
**METEOROLOGY SUB-GROUP TWELFTH MEETING (MET/SG/12)**

*(Dakar, Senegal, 1 – 5 December 2014)*

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**Agenda Item 4: Review of the Outcome of the 2014 Meteorology Divisional Meeting (Montréal, Canada, 7 – 18 July 2014)**

*(Presented by the Secretariat)*

**SUMMARY**

This paper reviews the outcome of the 2014 Meteorology Divisional Meeting held from 7 to 18 July 2014 in Montreal, Canada. The objective of the meeting was to endorse provisions for the transition from traditional message-based to net-centric provision of meteorological information recognized as a key enabler for the future global ATM system.

The action by the Meeting is at paragraph 3.

**References:** Report of the Air Navigation Commission (ANC) during its 197<sup>th</sup> session, report of the ICAO council during its 203<sup>rd</sup> Session.

**1. Introduction**

The Meteorology (MET) Divisional Meeting of 2014 (MET/14), conjoint with the 15th Session of the World Meteorological Organization (WMO) Commission for Aeronautical Meteorology (CAeM) was held at the Headquarters of the International Civil Aviation Organization (ICAO) in Montreal, 7 to 18 July 2014. The meeting was attended by 308 participants from 95 States and 7 international organizations (the Agency for Air Navigation Safety in Africa and Madagascar (ASECNA) the Civil Air Navigation Services Organisation (CANSO) the European Union (EU), the European Organisation for the Safety of Air Navigation (EUROCONTROL), the International Air Transport Association (IATA), the International Federation of Air Line Pilots' Associations (IFALPA), and the WMO).

**2. Discussions**

*2.1 Supporting the “one sky” concept through the enhancement of meteorological service for international air navigation*

2.1.1 The meeting was apprised of a new (fourth) edition of ICAO's Global Air Navigation Plan (GANP) (Doc 9750) together with a companion new edition of the ICAO's Global Aviation Safety Plan (GASP) (Doc 10004), which had been approved by the ICAO Council and endorsed by the 38th Session of the ICAO Assembly in 2013. To meet the global need for airspace interoperability while maintaining

its focus on safety, the meeting noted that, under the concept of “One Sky” for international air navigation, the Organization had initiated an aviation system block upgrade (ASBU) methodology as part of the GANP in order to develop a set of air traffic management (ATM) solutions or upgrades, take advantage of existing equipage, establish a transition plan, and enable global interoperability.

2.1.2 To ensure that the MET-specific ASBU modules were understood in the context of their relationships and interdependencies with the other modules and including those related to system wide information management (SWIM), the meeting recommended to update the GANP and ASBU methodology to reflect such interdependencies as well as including a B2-AMET module in the Block 2 timeframe covering the period 2023-2028 which had not been explicitly developed previously. (Recommendations 1/1 and 1/2).

2.1.3 The meeting requested ICAO to ensure that the evolution of aeronautical meteorological service provisions was in the spirit of Resolution A38-11 of the 38th Session of the ICAO Assembly and consistent with the rolling fifteen-year strategy contained in the GANP (Recommendation 1/3).

## 2.2 *Improving the safety and efficiency of international air navigation through enhanced meteorological service provision*

2.2.1 To support the ASBU methodology contained in the GANP the meeting agreed to develop the world area forecast system (WAFS) during the 2013 to 2028 timeframe focussed around a set of principles including the implementation of improved turbulence and icing algorithms and other forecast improvements, the use of forecast ensembles and the integration of WAFS information into the SWIM environment (Recommendations 2/1, 2/5 and 2/13 refer).

2.2.2 To ensure that the operation of the aeronautical fixed service (AFS) satellite distribution system for information relating to air navigation (SADIS), and the Secure SADIS FTP and WAFS Internet File Service (WIFS) Internet-based services, continue to meet user expectations the meeting recommended an appropriate ICAO expert group be tasked to further develop them in a manner consistent with the GANP. In addition, in deciding that SADIS 2G should not be extended beyond 2019, the meeting recommended that an appropriate expert group should undertake formal testing of the exchange of global OPMET information and WAFS forecasts on the ATS message handling system (AMHS) (Recommendations 2/2 and 2/3).

2.2.3 With regard to international airways volcano watch (IAVW), the meeting agreed that it was vital that the IAVW continue to evolve in line with the GANP. Therefore the meeting recommended that an appropriate ICAO expert group be tasked, in close coordination with WMO, to further develop the requirements for the IAVW consistent with the GANP including its integration into the future SWIM environment (Recommendation 2/6).

2.2.4 With regard to the development of initial provisions to meet the requirements for information concerning space weather, involving the establishment of space weather centres the meeting agreed not to include them in the draft Amendment 77 to Annex 3 in view of a lack of maturity but agreed that ICAO should work towards enabling space weather services for aviation by developing Annex 3 provisions for inclusion in 2018 (Recommendation 2/7).

2.2.5 With regard to the dissemination of information on the release of radioactive material into the atmosphere, the meeting recommended that an appropriate ICAO expert group, in close coordination with WMO, should be tasked to further develop provisions consistent with the evolving GANP (Recommendation 2/8).

The meeting supported, in principle, the evolution of the existing WAFS and IAVW, and the further development of provisions for space weather information, release of radioactive material and toxic chemicals and other hazardous meteorological phenomena. However, the meeting agreed that it was imperative that the future management and governance of the aeronautical meteorology system serving international air navigation be assessed in relation to the overall migration to the use of digital information. (Recommendation 2/4 refers).

2.2.6 In view of long-standing SIGMET implementation deficiencies in some States, the meeting agreed that there was an urgent need for the establishment of regional hazardous weather advisory centres (RHWACs) to assist meteorological watch offices (MWOs) with the provision of SIGMET information for select hazardous meteorological conditions that included, as a minimum, thunderstorms, icing, turbulence and mountain waves, but which excluded volcanic ash and tropical cyclones. Therefore the meeting recommended that a regional hazardous weather advisory framework should be implemented expeditiously and requested that an appropriate ICAO expert group, in close coordination with WMO, be tasked to develop a regional advisory system for select en-route hazardous meteorological conditions especially in those States where notable SIGMET-related deficiencies persist (Recommendation 2/9).

2.2.7 The meeting recommended that ICAO, in close coordination with WMO, should be tasked to include meteorological service for the terminal area and other relevant operational requirements in Block 1 and subsequent blocks of the ASBU methodology to highlight potential related impacts on air traffic flow in consideration of air traffic control and ATM (Recommendation 2/10).

2.2.8 To support the implementation by 2028 of module B3-AMET of the aviation system block upgrades (ASBU) methodology the meeting recommended that an appropriate ICAO expert group be tasked, in close coordination with WMO, to undertake advanced planning, in the 2015 to 2020 timeframe, of the technological requirements and aeronautical meteorological service capabilities needed (Recommendation 2/11).

2.2.9 To support transition to a more collaborative operating environment and increased automation, the meeting recommended the development of provisions for aeronautical meteorological information services in the context of CDM and common situational awareness (Recommendation 2/13). Additionally, the meeting recommended that ICAO and WMO should ensure that human factors considerations remain integral to aeronautical meteorological service provision during the transition. (Recommendation 2/14).

2.2.10 Integrating meteorological information exchange developments into the future system wide information management environment

2.2.11 To support trajectory based observations (TBO), the meeting recommended that an appropriate ICAO expert group (or groups), in close coordination with WMO finalize a draft concept of operations and roadmap concerning aeronautical meteorological information integration for TBO and establish further ATM requirements and aeronautical meteorological service capabilities (Recommendation 3/1).

2.2.12 To support the integration of meteorological information into a future SWIM environment, to allow the ATM system to develop along with the expectations of the GANP, the meeting recommended that ICAO, through an appropriate expert group and in close coordination with WMO, develop provisions to enable the inclusion of aeronautical meteorological information in the future SWIM environment consistent with the GANP based on given milestones and guided by an appropriate roadmap. (Recommendation 3/2).

2.2.13 To ensure that the meteorology-related developments within the SWIM environment are fully aligned with the mandates of both ICAO and WMO, the meeting recommended ICAO, through an appropriate expert group and in close coordination with WMO, to include consideration of a number of issues including the identification and recognition of approved data sources, cost recovery and the scalability of data requirements (Recommendation 3/3).

### 2.3 *Institutional issues*

2.3.1 The meeting recommended that ICAO and WMO undertake a thorough review of the Working Arrangements between ICAO and WMO (*Working Arrangements between the International Civil Aviation Organization and the World Meteorological Organization* (Doc 7475)) in order to ensure that they appropriately reflect the respective mandates, governance structures and modes of operation of the two organizations (Recommendation 4/1).

2.3.2 In order to clarify the use of the terms “Contracting State” and “Meteorological Authority” in certain provisions of Annex 3/Technical Regulations [C.3.1] and in related guidance material, the meeting recommended ICAO, in coordination with WMO, to further clarify the notion of meteorological authority, through appropriate amendments to ICAO provisions and supporting guidance material (Recommendation 4/2).

2.3.3 With regard to the oversight of aeronautical meteorological service provision, the meeting recommended ICAO to urge States to ensure that the personnel performing safety oversight functions of the aeronautical meteorological service are adequately qualified and competent, thus meeting the requirements of Annex 19, and to develop appropriate guidance material to assist States (Recommendation 4/3). In this regard, the meeting may wish to formulate the following draft conclusion.

**Draft Conclusion 12/XX:           Qualification of personnel performing safety oversight functions of the aeronautical meteorological service**

**That, personnel performing safety oversight functions of the aeronautical meteorological service in the AFI region, is adequately qualified and competent as stipulated in Annex 19 to the Chicago convention.**

2.3.4 To strengthen guidance on national cost recovery, particularly in those States with complex airspace arrangements, the meeting recommended that ICAO and WMO undertake a review and, as necessary, update of guidance/guidelines on the recovery of costs of aeronautical meteorological service provision (Recommendation 4/4).

2.3.5 To ensure that the competency and underpinning training of the aeronautical meteorological personnel is sufficient to adapt to new working practices, the meeting tasked WMO, in coordination with ICAO, to undertake steps through the implementation of a competency framework based on quality management system principles and supported by relevant training material. (Recommendation 4/5).

2.3.6 To mitigate the risk of critical misunderstandings caused by language problems that may, have flight safety implications downstream, the meeting recommended that ICAO, in close coordination with WMO, consider the development of provisions concerning the required level of English language proficiency of aeronautical meteorological personnel (Recommendation 4/6).

2.3.7 Taking into account existing ICAO provisions and WMO Resolution 40, and appreciating that the cost for the provision of aeronautical meteorological service was entirely recoverable from aviation, the meeting recommended that ICAO and WMO remind States/Members of their obligations in respect of

the provision and use of aeronautical meteorological information for aeronautical purposes only (Recommendation 4/7).

#### 2.4 *Standards, Recommended Practices and Procedures*

2.4.1 Taking into account the discussions under Agenda Items 1 to 5 the meeting formulated a draft Amendment 77 to Annex 3/Technical Regulations [C.3.1] and consequential amendments to Annex 11, PANS-ABC and PANS-ATM (Recommendation 5/1).

2.4.2. Noting the need for the clear distinction between functional and performance requirements and the elaboration of those requirements through technical specifications the meeting recommended that ICAO, in coordination with WMO, undertake a restructuring of Annex 3/ Technical Regulations [C3.1] and the development of a *Procedures for Air Navigation Services — Meteorology* (PANS-MET, Doc xxxx). This restructure would be done as part of Amendment 78 to Annex 3 (Recommendation 5/2)

#### 2.5 *Action by ANC and the ICAO Council*

2.5.1 The Air Navigation Commission, during its 197<sup>th</sup> session, reviewed the recommendations developed by the 2014 meteorology divisional meeting. Likewise, the ICAO Council will take appropriate action during its 203<sup>rd</sup> Session.

2.5.2 Actions taken by the Council and those to be taken by the Council are at **Appendix A** to this paper

2.6 To allow a greater involvement of the AFI region in the activities of future expert groups proposed by the MET/14, the meeting my wish to formulate the following Conclusion:

**Draft Conclusion 12/XX      Participation in the activities of the future Expert Group on the implementation of MET related SWIM Activities**

**That, AFI States be encouraged to participate in the activities of the future Expert Group on the implementation of the system wide information management (SWIM) in the MET field. .**

### **3      Action by the Meeting**

3.1 The MET/SG is invited to:

- a) Note the information provided in this paper ; and
- b) Decide on the draft Decision and Decisions proposed for the Sub-Group's consideration.

## **APPENDIX A- Recommendations of METDIV14**

AGENDA ITEM 1- GANP, ASBU, MET

Rec. No.	Title of recommendation	Suggested ANC follow-up action	Suggested Council follow-up action
1/1	Updating the GANP and ASBU methodology to reflect ASBU MET module dependencies with other modules	To approve and request Sec Gen to take appropriate action	To note
1/2	Inclusion of a MET-specific module related to Block 2 of the ASBU methodology	To approve and request Sec Gen to take appropriate action	To note
1/3	Evolution of aeronautical meteorological service provisions	To approve and request Sec Gen to take appropriate action	To note

AGENDA ITEM 2- MET in Blocks 0 to 3

Rec. No.	Title of recommendation	Suggested ANC follow-up action	Suggested Council follow-up action
2/1	Development of the WAFS in support of the ASBU methodology through to 2018	To approve and request Sec Gen to take appropriate action	To note
2/2	Operation and further development of the aeronautical fixed service satellite distribution system and Internet-based services	To approve and request Sec Gen to take appropriate action	To note
2/3	Withdrawal of the SADIS 2G satellite broadcast and formal testing of the exchange of global OPMET and WAFS forecasts on the AMHS	To approve and request Sec Gen to take appropriate action	To note

2/4	Review of MET information service provision framework to reflect GANP objectives	To approve and request Sec Gen to take appropriate action	To note
2/5	Further development of the WAFS in support of ASBU Blocks 1 and 2	To approve and request Sec Gen to take appropriate action	To note
2/6	Further development of the international airways volcano watch (IAVW)	To approve and request Sec Gen to take appropriate action	To note
2/7	Development of provisions for information concerning space weather	To approve and request Sec Gen to take appropriate action	To note
2/8	Further development of provisions for information on the release of radioactive material into the atmosphere	To approve and request Sec Gen to take appropriate action	To note
2/9	Implementation of a regional advisory system for select en-route hazardous meteorological conditions	To approve and request Sec Gen to take appropriate action	To note
2/10	Development of meteorological services for the terminal area	To approve and request Sec Gen to take appropriate action	To note
2/11	Advance planning relating to the aeronautical meteorological component of ASBU Block 3	To approve and request Sec Gen to take appropriate action	To note

2/12	Development of the WAFS in support of the ASBUs beyond 2028	To approve and request Sec Gen to take appropriate action	To note
2/13	Development of provisions for aeronautical meteorological information services in the context of CDM and common situational awareness	To approve and request Sec Gen to take appropriate action	To note
2/14	Human factors considerations for the development of aeronautical meteorological service provisions	To approve and request Sec Gen to take appropriate action	To note

1. AGENDA ITEM 3-MET in context of SWIM and TBO

Rec. No.	Title of recommendation	Suggested ANC follow-up action	Suggested Council follow-up action
3/1	Aeronautical meteorological information to support trajectory-based operations	To approve and request Sec Gen to take appropriate action	To note
3/2	Inclusion of aeronautical meteorological information in the future SWIM-enabled environment	To approve and request Sec Gen to take appropriate action	To note
3/3	Further development of the SWIM concept relating to meteorology	To approve and request Sec Gen to take appropriate action	To note

AGENDA ITEM 4 MET institutional issues

Rec. No.	Title of recommendation	Suggested ANC follow-up action	Suggested Council follow-up action
4/1	Review of the working arrangements between ICAO and WMO	To note	To approve and request the Sec Gen to take appropriate action
4/2	Definition of meteorological authority	To approve and request Sec Gen to take appropriate action	To note
4/3	Oversight of aeronautical meteorological service provision	To approve and request Sec Gen to take appropriate action	To note
4/4	Guidance/guidelines on the recovery of costs for aeronautical meteorological service provision	To note	To approve and request the Sec Gen to take appropriate action
4/5	Evolving competency of aeronautical meteorological personnel	To note	To approve and request the Sec Gen to take appropriate action
4/6	English language proficiency of aeronautical meteorological personnel	To approve and request Sec Gen to take appropriate action	To note
4/7	Provision and use of aeronautical meteorological information for aeronautical purposes only	To approve and request Sec Gen to take appropriate action	To note

1. AGENDA ITEM 5- SARPs and PANS

5/2	Reorganization of provisions relating to aeronautical meteorology	To approve and request Sec Gen to take appropriate action	To note

**Note:**

Recommendation 5/1 (Amendment 77 to Annex 3/Technical Regulations [C.3.1] and consequential amendments to Annex 11, PANS-ABC and PANS-ATM) is addressed by the PDP/ANC under cover of AN-WP/8864