

C A R I B B E A N

M E T E O R O L O G I C A L

O R G A N I Z A T I O N

**ANNUAL MEETING OF DIRECTORS OF METEOROLOGICAL SERVICES Doc. 5**

Kingston, JAMAICA, 22NOVEMBER 2014

**OUTCOME/HIGHLIGHTS OF The Sixty‑SIXth Session of Executive council and THE 2014 ICAO/CAeM CONJOINT MEETING**

(Submitted by the Coordinating Director)

**Summary**

1. The sixty-sixth session of the Executive Council of the World Meteorological Organization was held in Geneva, Switzerland, from 8 to 27 June 2014. It was chaired by its President, **Mr David Grimes** of Canada. The Council adopted a work programme that is intended to achieve the results of the course set by the Sixteenth Session of the WMO Congress, which was held in Geneva in 2011.

2. The International Civil Aviation Organization (ICAO) held the Meteorology Divisional Meeting in Montréal, between 7 and 18 July 2014, in part conjointly with the Fifteenth Session of the World Meteorological Organization (WMO) Commission for Aeronautical Meteorology (CAeM-XV). The Meeting provided the international civil aviation community the opportunity to address issues vital to the current and future provision of aeronautical meteorological services.

**A. The Sixty-sixth Meeting of the WMO Executive Council**

*Service Delivery*

3. The Council agreed that service delivery lies at the heart of the WMO mission and daily work. The Council shared the conviction that raising the standards of service delivery was vital for the success of Members as service providers and their goal of enhancing the visibility of National Meteorological and Hydrological Services (NMHSs) and attracting new resources to strengthen their capacity.

4. It endorsed the concept that service delivery needed to be considered as the core business of WMO and that it should be integrated in a harmonized and holistic approach, based on the attributes and principles of effective service delivery as contained in *The WMO Strategy for Service Delivery* and its Implementation Plan, into all WMO Programmes, in particular Public Weather Services (PWS) and Disaster Risk Reduction (DRR) programmes. It agreed that Members should be assisted to implement service delivery in a practical manner, recognizing sectoral requirements by users through training, developing guidance, and sharing best practices.

*Aeronautical Meteorology*

5. The Council noted the progress made by Members in implementing quality management system (QMS) for aeronautical meteorological services. It was recalled that the ICAO and WMO requirement for ISO 9000 certification was a recommended practice, thus not necessitating a formal notification of non-compliance as per Article 9(b) of the Convention. Nevertheless, it has been proven that the ISO certification was the best practice that ensures credibility and confidence with the aviation users. In this regard, the Council noted the recent information on the number of Members per Region who have completed the QMS implementation and achieved ISO 9000 certification, as follows: Region I – about 25%; Region II – about 35%; Region III – about 30%; Region IV – about 20%; Region V – about 50%; and Region VI – about 90%. The Council expressed concern of the presented monitoring data on the implementation of QMS with most of the Regions still far below 50% with regard to ISO certification. Such a situation affects the credibility of the NMHSs and other aviation meteorology service providers and has a negative impact on their attempts to establish cost-recovery mechanisms.

*Implementation of Competency Standards for Aeronautical Meteorological Personnel*

6. It was recalled that during the intersessional period, the provisions concerning the required competencies for aeronautical meteorological personnel (AMP), including aeronautical meteorological forecasters (AMF) and aeronautical meteorological observers (AMO), included in the *WMO Technical Regulations* (WMO-No. 49, Volume I, Chapter 5), became standard practices as of 1 December 2013. Therefore, all Members were expected to undertake the necessary measures to ensure compliance with those standards and inform the Secretariat thereof. The Council also urged those Members who have not yet informed the Secretariat on the status of implementation to do so as soon as possible.

*Qualification Standards*

7. The Council further recalled that the qualification requirements for AMF in the *WMO Technical Regulations* will become a standard practice on 1 December 2016. The Council emphasized that the preparation for compliance with those requirements should be initiated in due time to avoid a big lag between the date of entry into force and the actual implementation by Members.

*Addressing critical deficiencies and future challenges*

8. Concern was expressed about persisting deficiencies in the provision of meteorological services to international air navigation by some Members, which have been included in the ICAO regional list of air navigation deficiencies, including: provision of MET observations and reports, SIGMET and Meteorological Watch Office (MWO) services, information on volcanic activity, and availability and use of World Area Forecast System (WAFS) products. Although some improvements have been achieved recently, the Council considered that the resolution of the safety-related deficiencies in the provision of aeronautical meteorological services should be addressed through coordinated sub-regional and national plans.

*WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS)*

9. The Council agreed that WIGOS, supported by WIS, should continue as a WMO Strategic Priority Area for the next financial period. Noting the difficulties in implementing WIGOS in some of the developing and least developed countries, the Council requested that increased priority be given to supporting the capacity development for WIGOS in these areas.

10. Recognizing the importance of the free and unrestricted exchange of data and products necessary for the effective implementation of WIGOS, and the need to integrate observations supporting a broad range of application areas from a large and heterogeneous variety of sources, both NMHS and non-NMHS owned, into the WIGOS framework, the Council requested the Inter-Commission Coordination Group on WIGOS to investigate whether the existing data policies and protocols in place for the Global Observing System and other WIGOS components adequately covers the requirements for WIGOS, and that the Group provide a report to Cg-17 on this issue.

11. The Council highlighted the importance of third-party (non-NMHS) observations for Members to provide enhanced services and noted that the WIGOS integration of these data is a critical contribution to WMO, its Members and its application areas. The Council agreed that the WIGOS Framework already provides a mechanism for NMHSs and their national partners to share observations, while recognizing that policies regarding these data normally fall outside of the NMHSs.

12. In this regard, the Council requested the Secretary-General to re-emphasize to Members the need to register all observing stations across all WIGOS component observing systems operating to WMO standards within their territories, providing the correct and complete coordinates of their observing stations, and to make their observations available in real-time. The Council also encouraged Members to make station identifiers available to potential non-NMHS collaborators in observations.

13. The Council reminded Members of their obligation to check and correct the entries in *WMO Publication No. 9, Volume A* for all their observing stations, and to ensure that the locations reported in TDCF reports are correct and consistent with Volume A, using the procedures of the *Operational Information System of the World Weather Watch*.

14. The Council strongly encouraged the WMO Permanent Representatives to nominate their National WIGOS Focal Points. This added to an earlier request on this matter from the president of Regional Association IV to all Members of the Region. The Council reiterated that commitment by Members to WIGOS is essential and urged Members to fully support implementation of WIGOS in their Region, including providing sufficient resources. In this regard, the Council agreed that it is essential to make Members aware that WIGOS is not optional but it is a necessity, and that it is relevant to all Members.

15. The Council thanked Members for participating in the World Weather Watch quantitative monitoring exercises. It noted that although the percentage of global upper-air observations received from the Regional Basic Synoptic Networks remained stable, increases in Regions IV and V masked a continuing decrease in the availability of upper-air observations from Region I.

16. The Council recalled the target of November 2014 for completing the migration to Table Driven Code Forms (TDCF). It noted that the use of TDCF is a prerequisite for increasing the range of World Weather Watch station identifiers, and that any Members who are unable to process reports that originate in TDCF would be unable to benefit from additional observations.

17. The Council noted with appreciation that CBS had addressed the need for capacity development activities to support Members in their implementation and operation of the WIS by developing draft WIS competences and an associated training and learning guide. These documents would help Members to identify whether they had access to the skills required to operate their WIS centres, and also provided guidance on how the skills of their staff could be developed to fill any gaps that were identified.

*Education and Training Programme*

18. The Council noted the growing demand for continuous professional development education and training associated with proposed competency standards in areas such as public weather services, marine forecasting, tropical cyclone/typhoon/hurricane forecasting, WIS and climate services. Further demand is also anticipated by Members in areas of professional and management training of NMS staff. Due to the increased requirements for compliance with the current and emerging qualification and competency standards/recommended practices, there would be a growing unmet demand for education and training in not only the traditional areas typically covered by the WMO Regional Training Centres (RTCs), but also new areas associated with increased user liaison related to multi-hazard early warning services and provision of climate services. The Council noted that part of education and training on climate services were included in the RCC mandatory function, and that the number of RCCs had recently been increased. The Council noted with anticipation that education-related activities between RTCs and RCCs would be implemented in a mutually complementing manner.

19. The Council welcomed the approach used to identify the staff numbers and capabilities in a range of service areas and encouraged the Secretary-General to continue to gather data from Members who had not yet responded. The Council considered that this information will contribute to decisions on where to invest resources to ensure that all Members are able to contribute to and benefit from activities proposed under the High Priority areas for the 2016‑2019 financial period.

**B. The ICAO/CAeM Conjoint Met Divisional Meeting**

20. The meeting was apprised of a new (fourth) edition of ICAO’s *Global Air Navigation Plan* (GANP) (Doc 9750) which represented a rolling fifteen-year strategy to guide complementary and sector-wide air transport improvements over the period 2013 to 2028. It noted that the GANP, together with a companion new edition of ICAO’s *Global Aviation Safety Plan* (GASP) (Doc 10004), had been approved by the ICAO Council and endorsed by the 38th Session of the ICAO Assembly in 2013.

21. The meeting noted that the GANP explored, inter alia, the need for more integrated aviation planning at both the regional and State level, and addressed required solutions by introducing a consensus-driven ***aviation system block upgrade*** (ASBU) methodology. It further noted that the GANP identified issues to be addressed in the near term, alongside financial aspects of aviation system modernization, and the increasing importance of collaboration and partnership as aviation recognizes and addresses the multi-disciplinary challenges that lay ahead.

*The Meteorological (MET) Component of the ASBU methodology*

22. The meeting was informed of the principle content of the three MET-specific ASBU modules within the current ASBU methodology, namely module B0-AMET in Block 0 (“Block zero”) (2013-2018), module B1-AMET in Block 1 (2018-2023) and module B3-AMET in Block 3 (2028 onwards), as well as those non-MET-specific ASBU modules across all four performance improvement areas where MET service would be of relevance.

23. The meeting was cognizant that, at present, there was no MET-specific module in the Block 2 timeframe (i.e. B2-AMET in 2023-2028) since the implementation of B1-AMET (2018‑2023) was expected to extend for a period beyond 2023. In this regard, the meeting noted that additional requirements could be expected in the MET domain for meteorological information and aspects of data collection and exchange. Hence, the Meeting recommended that ICAO identify the required MET capabilities to support Block 2-related operational improvements of the aviation system block upgrade (ASBU) methodology contained in the *Global Air Navigation Plan* (GANP) (Doc 9750), especially considering the introduction of airborne participation in collaborative air traffic management processes and the benefits of expanding meteorological observations by aircraft.

*Information on Hazardous Meteorological Conditions, including en-route hazards*

24. ICAO established in 2007, the Meteorological Warnings Study Group (METWSG) whose main task was to review Annex 3/Technical Regulations [C.3.1] concerning the content and issuance of SIGMET information, in order to meet the evolving needs of flight operations and in view of resolving long-standing SIGMET implementation difficulties encountered by many States. In this regard, the meeting was pleased to note that the METWSG had undertaken a trial in 2011 of the provision of SIGMET advisory information in the Africa-Indian Ocean (AFI) Region and part of the Asia and Pacific (APAC) Region, with the significant contribution of China, France and South Africa that had served as SIGMET advisory centres during the trial. In view of the positive outcomes of the trial, the Meeting noted a proposal for the establishment of the regional hazardous weather advisory systems (RHWACs) and agreed that the establishment of the RHWACs should be actively pursued.

25. The RHWACs to be established are intended to assist Meteorological Watch Offices (MWOs) with the provision of SIGMET information for selected hazardous weather that included, as a minimum, thunderstorms, icing, turbulence and mountain waves, but which excluded volcanic ash and tropical cyclones (given these existing volcanic ash and tropical cyclone advisory systems). The Meeting agreed that an initial phase of issuing advisories to MWO would serve as a precursor to the next two phases of further regional hazardous weather advisory provision development. The Statement of Strategic Intent setting out the objectives of the RHWACs and the timeline for the three phases is provided in **Annex I**.

*Restructuring of Annex 3/Technical Regulations [C.3.1] and the development of a new PANS‑MET*

26. The meeting was apprised that the 38th Session of the ICAO Assembly, through the formulation of Resolution A38-11, had recommended that the ICAO Council should, inter alia, promote the development and upkeep of broad system-level, functional and performance requirements, and should continue seeking the most appropriate means of development, translation, processing and dissemination of technical specifications. With this in mind, the meeting noted that a number of *Standards and Recommended Practices* (SARPs) in Part I and a majority of SARPs in Part II of the current eighteenth edition (2013) of Annex 3/Technical Regulation [C.3.1] could, from a performance-based perspective, be considered as a technical means of fulfilling a functional need and its stated performance requirement. By recognizing that such SARPs were, essentially, a means of compliance, the meeting considered whether a suitable future placeholder for such provisions could be a (new) Procedures for Air Navigation Services - Meteorology (PANS-MET).

27. The Meeting agreed that Annex 3/Technical Regulations [C.3.1] and a PANS-MET should clearly identify the following:

1. State obligations;
2. service provider obligations; and
3. technical requirements for the service; and moreover,

that Annex 3/Technical Regulations [C.3.1] should specify service requirements whilst PANS-MET should specify the means of complying with the service requirements.

28. In view of the significant work that would be required to restructure Annex 3/Technical Regulations [C.3.1] and concurrently develop a first edition of a PANS-MET, the meeting considered it prudent to undertake such work as part of Amendment 78 to Annex 3/Technical Regulations [C.3.1], the adoption (or applicability) of which should respect Block 1 of the aviation system block upgrades (ASBU) methodology contained in the *Global Air Navigation Plan* (Doc 9750).

*Amendment 77 to Annex 3/Technical Regulations [C.3.1]*

29. The Meeting reviewed and agreed to the propose amendment to Annex 3/Technical Regulations [C.3.1] which should serve as the basis for Amendment 77. In regards to quality management systems for aeronautical meteorology, the proposed amendment is as follows:

~~2.2.6~~ **~~Recommendation.—~~** *~~Demonstration of compliance of the quality system applied should be by audit. If non- conformity of the system is identified, action should be initiated to determine and correct the~~*

*~~cause. All audit observations should be evidenced and properly documented.~~* (Present text in Annex 3/Technical Regulations [C.3.1])

2.2.6 Demonstration of compliance of the quality system applied shall be by audit. If nonconformity of the system is identified, action shall be initiated to determine and correct the cause. All audit observations shall be evidenced and properly documented. (Amended text)

*Designated Meteorological Authority*

30. ICAO's Annex 3 — *Meteorological Service for International Air Navigation*/WMO Technical Regulations [C.3.1], Chapter 2, 2.1.4 required States/Members to designate a meteorological authority to provide meteorological service for international air navigation or to arrange for the provision on its behalf. In this regard, while the operational responsibility for aeronautical meteorological service resided with the designated meteorological authority, the ultimate responsibility for fulfilling the ICAO requirements in respect of the Convention on International Civil Aviation (Doc 7300) resided with the State.

31. In this regard, the Meeting took note of the practice of some States/Members to delegate the provision of meteorological service for international air navigation to a commercial entity. The meeting noted that such delegation, whilst fully in line with Annex 3/Technical Regulations [C.3.1], did not relieve the designated meteorological authority of the responsibility for safety oversight of the meteorological service provision through the maintenance of and adherence to performance standards, including quality assurance and quality control, and that the State/Member continues to bear the full responsibility for the meteorological service provided to international air navigation by that State/Member.

32. To this end, the meeting noted that some confusion remained regarding 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. It was agreed, therefore, that a review should be undertaken to provide clarification where possible in this regard. The review was not to change the intent of such provisions, particularly regarding the definition of the meteorological authority or the prerogative of the State to designate the meteorological authority.

*Oversight of Aeronautical Meteorological Service Provision*

33. The meeting was aware that as part of the Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA), ICAO conducts mandatory audits of all States with a view to improving global aviation safety through the correction of deficiencies identified by the audits. Moreover, the new Annex 19 — *Safety Management*, applicable since 14 November 2013, requires States to establish and implement a safety oversight system. Annex 19 recommends that the State should use a methodology to determine its staffing requirements for personnel performing safety oversight functions, taking into account the size and complexity of the aviation activities in that State. Furthermore, it requires each State to establish minimum qualification requirements for the technical personnel performing safety oversight functions and provide for appropriate initial and recurrent training to maintain and enhance their competence at the desired level.

34. The meeting noted that while the provisions extensively refer to the responsibilities of the State-designated meteorological authority, the provisions do not extend to describing the responsibilities of a meteorological inspectorate, where meteorological inspectors could be a subset of the personnel performing safety oversight functions. It was agreed that there was a need for a State to ensure that the personnel performing safety oversight functions of the aeronautical meteorological service were adequately qualified as required by Annex 19 - *Safety Management*. Therefore the Meeting recommended that ICAO urge States to ensure that the personnel performing safety oversight functions of the aeronautical meteorological service are adequately qualified and competent meeting the requirements of Annex 19 - *Safety Management.*

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**ICAO Statement of Strategic Intent on**

**Regional Hazardous Weather Advisory Systems (RHWACs)**

Reflecting its strategic objectives, and in an increasingly competitive business and technically advancing environment, ICAO recognizes:

1. the increasing demand from international civil aviation users for efficient and effective phenomena‐based hazardous meteorological condition information, seamlessly covering the globe in a coordinated and harmonized way; and
2. the limitations, inconsistencies and gaps in the current production of hazardous meteorological conditions information (in the form of SIGMET) required to be produced by each MWO for its associated FIR.

To meet international civil aviation user demands, and make best use of resources (including technology), this strategy proposes to transfer the issue of defined[[1]](#footnote-1) regional hazardous meteorological condition information to appropriately resourced regional centres, supported by respective meteorological watch offices (MWOs) as may be determined, in a three phased approach and in support of the Aviation System Block Upgrades (ASBUs) methodology of ICAO’s Global Air Navigation Plan (GANP), as follows:

1.1 **Phase One (2014‐2017):** The first phase is the establishment of regional hazardous weather advisory centres (RHWACs) to assist MWOs with the existing provision of SIGMET information in those ICAO Regions in need of such support.

Explanatory note: *Formal planning and development will begin with a mandate from the ICAO Meteorology Divisional Meeting in July 2014. All planning and arrangements will be in place with formal ratification of the scheme expected in Amendment* ***77*** *to Annex 3 (with intended applicability in November 2016), and parallel documentation in Regional Air Navigation Plans. The allocated RHWACs will commence operations at a date to be agreed but no later than December 2017.*

1.2 **Phase Two (2016‐2020):** The second phase (including the transition of the RHWACs) will cover the centralization of SIGMET‐related responsibilities of MWOs to regional hazardous weather centres (RHWCs) supporting multiple FIRs. This may include the amalgamation of existing volcanic ash advisory centres (VAACs) and tropical cyclone advisory centres (TCACs)[[2]](#footnote-2) into these RHWCs, and will include close liaison with users and detailed definition of all products to be supplied by the new centres.

Explanatory note: *Formal planning and development will begin in 2016 with the completion of planning for Phase 1. All planning and arrangements will be in place with formal ratification of the scheme expected in Amendment* ***78*** *to Annex 3 (with intended applicability in November 2019), and parallel documentation in Regional Air Navigation Plans. Planning will include the development of suitable RHWC performance metrics to support Phase 3. The allocated RHWCs will commence operations at a date to be agreed but no later than December 2020.*

1.3 **Phase Three (2020‐2024):** This phase primarily covers the review of the performance of the regional hazardous weather centres, making any appropriate recommendations in this regard. The review will also include, inter alia, an evaluation of the efficacy, or otherwise, of consolidating, in a further phase (potentially a Phase Four), hazardous meteorological condition information issued from a few centres conjointly covering the globe, in or after 2025.

Explanatory note: *The review will be undertaken in 2023 using performance data compiled for the years 2020 – 2022 inclusive. The review will include evaluation of operations, modelling, logistics, communications and science capability. A final report and recommendations will be provided by the end of 2023. If recommended, a reduced number of regional centres, or a few centres conjointly covering the globe, could be operating in 2025 if mandated in Amendment* ***80*** *to Annex 3 (with intended applicability in November 2025). It is noted, however, that any highly significant recommendations from this review process may need to go to an ICAO Meteorology Divisional meeting around 2025/2026 for ratification, delaying implementation of any significant changes until after about 2026.*

**Note**

Notwithstanding the strategic approach outlined above, and in accordance with Annex 3, Chapter 2, States can enter into bilateral arrangements at any time to obtain the support they may need to fulfill their MWO obligations with regard to SIGMET provision. As an interim arrangement, while Phase One of the strategy is implemented, such action is encouraged.

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1. Part of the first phase would be the identification of exactly what constitutes hazardous meteorological conditions, excluding

   the contemporary work of VAACs, TCACs and pending the expected future work of space weather centres. [↑](#footnote-ref-1)
2. VAACs and TCACs have been operating successfully in a regional capacity for the past several decades. [↑](#footnote-ref-2)