



**INTERNATIONAL  
CIVIL AVIATION  
ORGANIZATION**



**WORLD  
METEOROLOGICAL  
ORGANIZATION**

MET/14-WP/64  
CAeM-15/Doc. 64  
18/7/14

Meteorology (MET) Divisional Meeting  
(2014)

Commission for Aeronautical Meteorology  
Fifteenth Session

---

**Montréal, 7 to 18 July 2014**

## **REPORT ON THE GENERAL PORTION**

*(All Agenda Items considered conjointly with the  
Fifteenth Session of the Commission for Aeronautical Meteorology  
of the World Meteorological Organization)*

This report will be subject to review by the Air Navigation Commission and the Council of ICAO, and the Executive Council of WMO. The decisions of these bodies on the recommendations of the Meeting will be set forth in a Supplement to the Report of the Meeting, which will be issued in due course.

## LETTER OF TRANSMITTAL

To: President, Air Navigation Commission

From: Chairman, Meteorology Divisional Meeting (2014)

I have the honour to submit the report of the Meteorology Divisional Meeting (2014) which was held in Montréal from 7 to 18 July 2014.

A handwritten signature in blue ink, appearing to read 'P. Lechner', with a horizontal line extending to the right.

Peter Lechner  
Chairman

Montréal, 18 July 2014

**TABLE OF CONTENTS**

	<b>Page</b>
LIST OF RECOMMENDATIONS .....	ii-1
HISTORY OF THE MEETING	
1. Duration .....	iii-1
2. Representation .....	iii-1
3. Officers .....	iii-1
4. Secretariat .....	iii-1
5. Adoption of the agenda .....	iii-2
6. Working arrangements .....	iii-2
7. Opening remarks	
7.1 First Vice-President of the Council .....	iii-2
7.1 President of WMO.....	iii-3
7.3 President of the Air Navigation Commission.....	iii-6
7.4 President of the Commission for Aeronautical Meteorology of WMO.....	iii-8
LIST OF PARTICIPANTS .....	iv-1
AGENDA OF THE MEETING .....	v-1
GLOSSARY OF TERMS .....	vi-1
REPORT OF THE MEETING	
Agenda Item 1: Supporting the “One Sky” concept through the enhancement of meteorological service for international air navigation.....	1-1
Agenda Item 2: Improving the safety and efficiency of international air navigation through enhanced meteorological service provision.....	2-1
Agenda Item 3: Integrating meteorological information exchange developments into the future system-wide information management environment .....	3-1
Agenda Item 4: Institutional issues.....	4-1
Agenda Item 5: Standards, Recommended Practices and Procedures.....	5-1

**LIST OF RECOMMENDATIONS**

1/1	Updating the GANP and ASBU methodology to reflect ASBU MET module dependencies with other modules .....	1.3-1
1/2	Inclusion of a MET-specific module related to Block 2 of the ASBU methodology.....	1.3-2
1/3	Evolution of aeronautical meteorological service provisions .....	1.4-1
2/1	Development of the WAFS in support of the ASBU methodology through to 2018.....	2.1-1
2/2	Operation and further development of the aeronautical fixed service satellite distribution system and the Internet-based services .....	2.1-2
2/3	Withdrawal of the SADIS 2G satellite broadcast and formal testing of the exchange of global OPMET information and WAFS forecasts on the AMHS.....	2.1-3
2/4	Review of MET information service provision framework to reflect GANP objectives.....	2.2-1
2/5	Further development of the WAFS .....	2.2-3
2/6	Further development of the international airways volcano watch (IAVW).....	2.2-4
2/7	Development of provisions for information concerning space weather.....	2.2-5
2/8	Further development of provisions for information on the release of radioactive material into the atmosphere .....	2.2-6
2/9	Implementation of a regional advisory system for select en-route hazardous meteorological conditions .....	2.2-7
2/10	Development of meteorological service for the terminal area .....	2.2-8
2/11	Advanced planning relating to the aeronautical meteorological component of ASBU Block 3 .....	2.3-1
2/12	Development of the WAFS in support of the aviation system block upgrades (ASBUs) beyond 2028.....	2.3-1
2/13	Development of provisions for aeronautical meteorological information services in the context of CDM and common situational awareness .....	2.4-1
2/14	Human factors considerations for the development of aeronautical meteorological service provisions .....	2.4-2
3/1	Aeronautical meteorological information to support trajectory-based operations .....	3.1-1
3/2	Inclusion of aeronautical meteorological information in the future SWIM-enabled environment.....	3.2-1
3/3	Further development of the SWIM concept relating to meteorology .....	3.2-2
4/1	Review of the working arrangements between ICAO and WMO.....	4.1-2
4/2	Definition of meteorological authority.....	4.2-1
4/3	Oversight of aeronautical meteorological service provision.....	4.2-2
4/4	Guidance/guidelines on the recovery of costs of aeronautical meteorological service provision .....	4.2-3
4/5	Evolving competency of aeronautical meteorological personnel.....	4.2-4
4/6	English language proficiency of aeronautical meteorological personnel.....	4.2.5
4/7	Provision and use of aeronautical meteorological information for aeronautical purposes only .....	4.2-6
RSPP 5/1	Amendment 77 to Annex 3/Technical Regulations [C.3.1] and consequential amendments to Annex 11, PANS-ABC and PANS-ATM.....	5.1-1
5/2	Reorganization of provisions relating to aeronautical meteorology .....	5.2-2

## HISTORY OF THE MEETING

### 1. DURATION

1.1 The Meteorology Divisional Meeting (2014) (MET/14) was opened by the First Vice President of the Council, Mr. V. M. Aguado, at 1000 hours on 9 July 2014 in the Assembly Hall of the Headquarters of the International Civil Aviation Organization (ICAO) in Montreal. At the first Plenary, the meeting was also addressed by the President of the World Meteorological Organization (WMO), Mr. D. Grimes, the President of the Air Navigation Commission, Mr. F. Zizi, and the President of the WMO Commission for Aeronautical Meteorology, Mr. C-M. Shun. The meeting was held in part conjointly with the Fifteenth Session of the Commission for Aeronautical Meteorology (CAeM-15) of the WMO. The closing Plenary was held on 18 July 2014.

### 2. REPRESENTATION

2.1 The MET/14 meeting was attended by 308 participants from 95 States and 7 international organizations. A link to the list of participants is on page iv-1.

### 3. OFFICERS

3.1 The following officers were elected at the first Plenary meeting to serve both the Plenary and the MET Committee:

Chairman:	Mr. P. Lechner
First Vice-Chairman:	Mr. W. Maynard
Second Vice-Chairman:	Mr. D. Egere

### 4. SECRETARIAT

4.1 The Secretary of the meeting was Mr. G. Brock, Chief, Meteorology Section, ICAO assisted by Mr. D. Ivanov, Chief, Aeronautical Meteorology Division, WMO. Mr. Brock and Mr. Ivanov were assisted by:

<u>Agenda Item</u>	<u>Item Secretary</u>	<u>Assisted by</u>
1	Mr. N. Halsey	Mr. P. Dunda and Mr. J. Armoa
2	Mr. R. Romero	Mr. N. Halsey and Mr. G. Vega
3	Mr. N. Halsey	Mr. R. Romero
4	Mr. R. Romero	Mr. N. Halsey and Mr. A. B. Okossi
5	Mr. R. Romero	Mr. V. Ahago and Mr. N. Halsey

Other officers of the ICAO Secretariat provided advice to the meeting, as required.

4.2 General administrative arrangements for the meeting were made under the direction of Dr. F. Lui, Director, Bureau of Administration and Services. Language services were provided under the direction of Mr. L. Cherif, Deputy Director, Languages and Publications, assisted by Mr. V. Samochkine,

Chief, Interpretation Section, Mr. A. El Sehemawi (Chief, Arabic Translation Section), Mr. W. Wen (Chief, Chinese Translation Section), Mr. A. Detchou (Chief, French Translation Section), Ms. J. Antony (Chief, Russian Translation Section) and Ms. A. De Cuadra-Lindstrom (Chief, Spanish Translation Section).

4.3 The physical arrangements for the meeting were made by Mr. M. Romero, Chief, Conference, Security and General Services Section, Mr. S. Dehinde, Chief, Information and Communication Technology Section, and Ms. D. Rahmani, Supervisor, Document Management and Outsourcing Section. Other specialist officers of the ICAO Secretariat provided advice to the meeting as required.

## 5. **ADOPTION OF THE AGENDA**

5.1 The agenda developed by the Air Navigation Commission and submitted to States in advance of the meeting was adopted without change at the first Plenary meeting.

## 6. **WORKING ARRANGEMENTS**

6.1 The organization plan developed by the Air Navigation Commission and submitted to States in advance of the meeting was approved without change at the first Plenary meeting.

6.2 A coordinating group was established in accordance with the *Directives to Divisional-type Air Navigation Meetings and Rules of Procedure for their Conduct* (Doc 8143), and met as necessary during the course of the meeting. The coordinating group comprised the Chairman and Vice-Chairmen of the meeting (Plenary Committee and subordinate MET Committee), the Secretary of the meeting and representatives of the various Secretariat services catering to the meeting. The coordinating group was able to coordinate the activities of the meeting using the services and accommodations available.

## 7. **OPENING REMARKS**

### 7.1 **First Vice President of the Council of ICAO, Mr. Victor Manuel Aguado**

On behalf of the President of the Council, Dr. Olumuyiwa Benard Aliu, and the International Civil Aviation Organization, I have the privilege to welcome you to Montreal and to ICAO headquarters, and the honour to declare the Meteorology Divisional Meeting of 2014 open. This meeting is being held conjointly with the Fifteenth Session of the World Meteorological Organization Commission for Aeronautical Meteorology. You will be aware that WMO is a sister United Nations organization with whom ICAO has had formal working arrangements since 1953 and you may recall that the last MET Divisional Meeting in 2002 was also held in Montreal conjointly with the Twelfth Session of this WMO technical commission. I wish to extend a warm welcome to all of you.

I would like to extend a special welcome to Mr. David Grimes, President of the World Meteorological Organization. Mr. Grimes has been Assistant Deputy Minister and head of Environment Canada's Meteorological Service since July 2006. He has been Canada's Permanent Representative with WMO since December 2006 and was elected to serve as the organization's President in 2011 for a four-year term. Mr. Grimes has more than 35 years of scientific, research and management experience at

Environment Canada and over 20 years of experience working with WMO initiatives and programmes. It is a pleasure to have the presence of Mr. Grimes during this opening session.

It goes without saying that the work to be undertaken during this meeting will have implications for both ICAO and WMO. With the customary assistance and cooperation of WMO, we believe that the output of the meeting will be responsive to the evolving requirements for aeronautical MET services and therefore of utmost importance for the future service provision.

This meeting comes at a very important, very relevant time when our Member States are embarking on the implementation of complementary and sector-wide air transport improvements over the period to 2028 and beyond, as detailed in the fourth edition of ICAO's Global Air Navigation Plan. The fourth edition of the GANP, which was approved by the Council and endorsed by the 38th Session of the ICAO Assembly in 2013, explores the need for more integrated civil aviation planning at both the regional and the State level. It also identifies required solutions by introducing a consensus-driven aviation system block upgrades methodology. The GANP and other complementary ICAO publications such as the Global Aviation Safety Plan are intended to assist Member States in the realization of a "One Sky" concept for international air navigation.

During the course of this meeting you will therefore address technical issues of direct relevance to the modernization strategy put forward in the GANP, including the enhancement of existing MET services and the development of new services. And you will address a number of institutional issues that are either already present or that are likely to emerge as MET service provision adapts to the evolving needs of the aviation user community as well as the evolving ways in which services can be provided as the underlying science and technology advances. So, issues concerning the working arrangements between ICAO and WMO, the cost recovery and the oversight of MET services, and the competence of personnel engaged in the provision of MET service will be addressed amongst others.

In all, this meeting comes at a fitting moment to address the short-, medium- and long-term enhancements to MET service provision that are needed to ensure continued safe and efficient international civil aviation for the next 15 years or more. You will therefore include in your deliberations the development and maintenance of ICAO provisions intended to foster implementation, which provide for a clear determination of regulatory oversight and service provider obligations and the appropriate mean of compliance.

The President of the Air Navigation Commission, Mr. Farid Zizi, will provide a more detailed explanation of your agenda shortly.

With more than 48 working papers to be addressed, your programme over the coming days is extensive and your time is limited. It goes without saying that your work is of great importance to the continued safety and efficiency of international civil aviation. Rest assured therefore that the Air Navigation Commission and the Council will review the recommendations arising from the meeting in the coming months. It only remains for me to extend to you my very best wishes for a successful meeting and a pleasant stay in Montreal.

## 7.2 **President of WMO, Mr. David Grimes**

Mr Victor Aguado, First Vice-President of ICAO Council, Mr Farid ZIZI, President of the Air Navigation Commission, Dr. Xu Tang, Director Weather and Disaster Risk Reduction Service Department and

representative of the WMO Secretary General, Dr. C.M. Shun, President of the WMO Commission for Aeronautical Meteorology, distinguished experts and guests.

It is a great pleasure for me to welcome you all, on behalf of the World Meteorological Organization, to the Meteorology Divisional Meeting (2014), organized and held conjointly between the International Civil Aviation Organization and the WMO. I would like to express my thanks to our colleagues from ICAO for hosting this meeting on their premises and for the excellent working arrangements.

Mr. Aguado already outlined the link of the Divisional Meeting with the most important developments in air transport such as the implementation of the Global Air Navigation Plan through the Aviation System Block Upgrades methodology. I would highlight also that the integration of the aeronautical meteorological information in the System-Wide Information Management (SWIM) is regarded as a key enabler.

The provision of services to aviation has been a significant driver for global meteorology stimulated by the rapid growth of civil aviation since the 1950's. The cooperation established at the early stages between WMO and ICAO helped develop a sound international regulatory framework designed to contribute to the safety of international air navigation as set out in Annex III to the ICAO Convention and WMO Technical Regulations, Volume II. The regulatory framework as defined in these two documents serves as a model in the development technical regulations for other service domains.

A week ago, we concluded the 66th session of the WMO Executive Council and I am happy to inform you that aviation meteorology not only remains one of our priorities but the level of engagement of the Council in the issues being discussed here at the MET Divisional meeting was both deep and informed. One of our conclusions was to reinforce aviation meteorology, particularly the implementation of Quality Management Systems, professional competencies and improvement in service delivery remain a priority for the Organization as reflected in our draft Strategic Plan of WMO for the period 2016–2019. This strategic plan will to be concluded next year when all 191 Member States and Territories come together for the Seventeenth World Meteorological Congress. The decisions and recommendations of this Conjoint meeting will be fully integrated into our planning process.

This being said, we recognize that the current challenges related to ensuring compliance with the ICAO and WMO requirements on quality and competency require continued focused attention and concerted action. Whereas WMO has invested significant effort through the CAeM, our Education and Training programme and enabled investments from donors, there remains much work to accomplish. I assure you the Organization remains focused on the quality of services rendered by NMSs and the competency its personnel that underpin safe operations.

An important part of this conjoint Meeting is the examination of the requirements for the provision of space weather information for ionospheric disturbances. The international meteorological community has worked hard during the last decade to mature operational space weather services. By monitoring and predicting the impact of solar flares, solar radiation and geomagnetic storms on a wide range of temporal and spatial scales. We will enable informed decisions on potential disturbances or outages of the communication and navigation systems. This is essential to mitigate the safety risks and I might add that this is particularly important for operations over Polar Regions.

Advisories and warnings for volcanic ash, tropical cyclones and radioactive releases in the atmosphere are other examples of specialized services provided by regional centres around the world. Recent events illustrate the disruptive nature of these hazards to the global air navigation system. ICAO and WMO are proud of the



cooperative effort in supporting the International Airways Volcano Watch system developed in close cooperation with other stakeholders such as IATA and IFALPA. I look forward to the outcomes of this session that relate to advances in these services that are critical for the safety and efficiency of air operations.

Recently the Council of ICAO expressed concern over climate change. The science informs us that perturbations in the climate system influence weather patterns including the frequency and intensity of extreme events with consequences on aviation operations and infrastructure. WMO and its partners have established the Global Framework for Climate Services in 2012 with the vision to enable better management of the risks of climate variability and change, and facilitate adaptation to climate change through the provision of science-based climate information and prediction to assist planning and policy making on the global, regional and national scale.

Keeping air travelers and aircraft safely separated from meteorological hazards in the future will require improved accuracy and resolution of the meteorological data and forecasts. This will also require a more efficient, interoperable delivery system to get information that is “fit for purpose” to decision-makers. This means that we need to plan the deployment of information and communication technology (ICT) and our respective research and development activities to operationalize common solutions.

Aeronautical meteorological services are evolving and WMO Members recognize they must adapt to the changes envisaged in the future global air traffic management concept. The meteorological community will respond to the challenges of the evolving ATM with stepwise improvements of existing services and the introduction of new arrangements and services.

I leave you with an important message from the recent WMO Executive Council. The significant investment by NMSs in infrastructure and human resources is essential to the industry. The cost-recovery from aviation is outlined in ICAO’s Manual on Air Navigation Service Economics and the WMO Guide on Aeronautical Meteorological Service Cost Recovery. These frame the mechanisms by which a sound financial relationship exists to support a substantial part of the investment by NMSs. The guidance developed by ICAO and WMO suggest that cost recovery mechanisms by the Member States should be developed in a fair, equitable and transparent manner. Unfortunately, this is not always the case and this has had a negative impact on their capacity to provide quality service to aviation.

I believe that a viable national meteorological service is an essential partner in sustaining the basic infrastructure for data acquisition and the dissemination of meteorological information for safe and efficient air operations. Our mutual interests will be best served if National Meteorological Services remain reliable partners and providers of high quality MET information and services to the aviation sector. I trust the Conjoint meeting will pay due attention to this issue and that adequate cost-recovery mechanisms are developed to ensure that NMSs continue to contribute to the safety of the ANS and air travelers worldwide.

In conclusion, I believe that this Conjoint Meeting will be a key event for the aviation MET community. As president of WMO I look forward to your guidance to ensure that ICAO and WMO remain in harmony and that an ordered transformation in the changing global Air Traffic Management environment is achieved.

I wish you much success over the next ten days and trust you will have some opportunity to experience the bon vivant of this great city.

### 7.3 **President of the Air Navigation Commission of ICAO, Mr. Farid Zizi**

On behalf of the Air Navigation Commission it is my great pleasure to address the opening of this Meteorology Divisional Meeting. I would like to inform you that the Air Navigation Commission has closely followed the developments leading up to this meeting and has been directly involved in the development of the agenda and the organizational plan.

As the First Vice President of the Council has already indicated, the implementation of complementary and sector-wide air transport improvements over the next 15 years or more will rely, in part, on the provision and enhancement of aeronautical meteorological services, particularly if the desired improvements in aviation safety and air navigation capacity and efficiency are to be realized to their full potential. It is for this reason that the theme running through your agenda is how MET service provision needs to be maintained or, in many cases, enhanced or adjusted over the coming years. The proposals that you will discuss are intended to ensure that identified user requirements for a globally interoperable air traffic management system can be fulfilled through sound scientific, technological and operational capabilities from the MET perspective. This is one of the reasons why the working arrangements that ICAO has with WMO are so very important, since ICAO takes the lead in establishing the requirements for MET service for international air navigation and WMO takes the lead in specifying the technical methods and practices to be used to fulfil the requirements. This is also why you will be invited to consider that a review and update of the working arrangements should be undertaken in order to ensure their continued relevance in a changing world.

The potential operational benefits arising from the recommendations that you make during the meeting are to be kept always in the forefront of your considerations. Every proposed measure to improve aviation safety or air navigation capacity and efficiency through changes to existing MET services or the establishment of new MET services must be carefully assessed including, as necessary, the cost impacts.

During the course of the meeting you will be working as one committee, a MET Committee. You will address a total of five agenda items plus you will conduct a review of the draft report during the MET Committee phase.

Under Agenda Item 1 you will be given a brief overview of the 2013 edition of the Global Air Navigation Plan and the aviation system block upgrades (called “ASBU”) methodology, particularly as it related to MET. As part of Agenda Item 1 you will also consider aspects related to the development and upkeep of broad system-level, functional and performance requirements. You will initiate consideration of how ICAO provisions for MET could be structured in the spirit of recent Assembly resolutions, including through the proposed development of a new PANS-MET. You will return to some of these items under Agenda Item 5.

Under Agenda Item 2 you will give due consideration to the short-, medium- and long-term enhancement of MET services which are considered necessary or desirable to realize operational improvements within the modernization strategy contained in the GANP. So, supported by a series of transitional roadmaps and concepts of operation, you will give due consideration to the enhancement or adaptation of existing MET systems and services as well as the development of new MET systems and services needed to support the realization of a global ATM system over the next 15 years or so. Given the trend to a more collaborative and more automated operating environment, you will give due consideration to some of the issues that already exist or that may arise from a MET service provider perspective and a user perspective in the context of supporting collaborative decision making and common situational awareness.

---

Under Agenda Item 3, and closely related to the previous agenda item, you will turn your attention to the integration of digital MET information into the future system-wide information management environment, which will underpin the global ATM system that I have mentioned already. You will discuss some of the human-to-human and machine-to-machine interactions, and the information exchange services and models needed to foster the integration of MET into SWIM. In a related issue, you will also consider MET information integration in the context of trajectory-based operations. Enhanced MET information will play an important role in supporting trajectory-based operations, so it may be expected that you will address some of these issues also under Agenda Item 2, with their integration into a ‘total system’ falling under this agenda item.

Under Agenda Item 4 you will address a range of institutional issues – some old, some new – facing MET service provision, particularly as the aviation community progresses with the implementation of a globally interoperable, harmonized ATM system. In addition to the ICAO-WMO working arrangement that has been mentioned already, you will discuss issues such as the oversight of MET, the cost recovery of MET (particularly in the context of multi-regional, regional and sub-regional MET service provision), MET personnel competency and English language proficiency, and the provision and use of MET information for aeronautical purposes only. These are important issues that will have a bearing on the work of ICAO and WMO over the coming years; therefore, clear recommendations on the aeronautical MET community’s expectations from this meeting will be essential.

Finally, under Agenda Item 5 you will consider a consolidated proposed amendment to Annex 3 as well as consequential amendments to other ICAO provisions. The proposals put forward for your consideration have arisen principally from the ICAO MET expert groups over the past 12 to 18 months and are directly relevant to the discussions that you will have during the meeting. You will also return to an issue initially discussed under Agenda Item 1 – namely the proposed development of a new PANS-MET concurrent with a restructuring of Annex 3. The recommendations that you make in this regard will have a great bearing on your work and the work of the Secretariat over the coming years.

By close of business next Monday you will have concluded your deliberations of Agenda Items 1 to 5. Following the Fifteenth Session of the WMO Commission for Aeronautical Meteorology next Tuesday and Wednesday you will then reconvene as a MET Committee next Thursday to review the draft report. Then, next Friday, you will reconvene as a Plenary to adopt the meeting report. It is of paramount importance therefore that you make optimum use of the limited time available over the next week-and-a-half. I am sure that the Chairman will be looking to help navigate you through non-turbulent but perhaps at times congested airspace over the coming days. It is important that you depart on time with your seatbelts safely secured, that you have a smooth flight, and that you arrive at your destination having given every item on the agenda sufficient consideration and that you reach consensus with every recommendation that you formulate.

I mentioned at the beginning of my remarks that the Air Navigation Commission has been closely following the developments leading up to this meeting. The same sentiment applies once your meeting has concluded. The ANC will undertake a review of the recommendations arising from the meeting in order for a report to then go forward to the Council. In parallel, the ANC will undertake a preliminary review of the proposed amendment to the SARPs ahead of consultation with States and relevant international organizations in early 2015.

For ICAO and WMO, conjoint MET Divisional Meetings happen infrequently. In fact, history shows that they occur typically just once every 8 or 12 years and this is only the eighth such conjoint meeting since the two organizations were established. So, it is important that you make efficient and effective use of

your time, since it may be many years before you are all under the same roof again. This MET Divisional Meeting will be amongst the shortest, if not the shortest ever. The increased efficiency can be attributed, in part, to the use of electronic documentation preparation and distribution, but also to a kind request for a focussed approach by all delegates during the proceedings. So, with this in mind, I will conclude simply by wishing you a highly productive meeting and by saying that the ANC very much looks forward to reviewing the outcomes of this meeting in due course.

Thank you.

#### **7.4 President of the Commission for Aeronautical Meteorology of WMO, Mr. Chi-Ming Shun**

Mr Victor Aguado, first vice president of the ICAO Council, Mr Farid Zizi, president of the ICAO Air Navigation Commission, Mr David Grimes, president of the WMO, distinguished delegates, ladies and gentlemen. It is a great honour for me to address you now as we start this most important meeting for aeronautical meteorology held once every decade or so.

Twelve years ago I had the privilege to attend this meeting, recalling that Dr Neil Gordon, the then president of the CAeM, highlighted the history of the development of the World Area Forecast System (WAFS), created by us back in 1982 which had since evolved through the subsequent conjoint ICAO/WMO meetings in 1990 and 2002.

Today, after three decades, we have seen tremendous growth in international aviation transport as well as substantial advancements in meteorological science, services and enabling technologies. It is high time for us to re-think how aeronautical meteorology could better serve aviation in the coming decades. Indeed the Commission for Aeronautical Meteorology has, in the past several years, proactively engaged with ICAO and the aviation community to inform our users the evolving capabilities that the meteorological community could deliver to serve Air Traffic Management while at the same time the limits imposed by Mother Nature that we need to respect.

As pointed out by our distinguished colleagues from ICAO, WMO takes the lead in specifying the technical methods and practices to be used to fulfill the requirements established by ICAO for meteorological service for international air navigation. While this long-standing working arrangement between WMO and ICAO is not expected to change fundamentally, this important document, last updated in 1963, which by the way was the year when I was born, is proposed by this meeting to be reviewed so as to ensure that will continue to be current and relevant in the rapidly changing world.

As for the requirements, ICAO's latest Global Air Navigation Plan has laid down an ambitious plan to seek upgrades to the aviation systems in phases, driving significant changes to requirements for meteorological service for international air navigation in the next 15 years. These changes will inevitably lead to new models of service delivery that would allow a shift from product-centric to data-centric service provision, a more balanced approach in local, regional and global service provision and integration of meteorological information into the future system-wide information management environment.

The meteorological community has to respond by delivering new technical methods and practices to meet the new requirements, and by closing existing gaps over certain regions and aspects, like the provision of SIGMET information for assurance of flight safety en-route. We will not underestimate the challenges. But having implemented good governance tools like quality management systems and effective cost

recovery mechanisms, fostering even closer partnership with the aviation users and actively bringing scientific research and new technologies to operational applications, I am confident that the meteorological service providers of our Member States would respond well to the challenges, stay competitive, and able to harness the opportunities to deliver better services to the aviation industry in the decades to come.

In the next one and a half week, we will need to consider together and agree on the change proposals, road maps and concepts of operations. We need to find the right balances, including the balance in the future roles of local, regional and global service providers, the balance in driving for efficiency while assuring safety, the balance in automated service provision versus human involvement, the balance in enabling effective data sharing while ensuring that the data is credible and fit for the intended purpose, and so on. In considering these issues, I would suggest that the underlying principles of equal opportunity and consensus in international cooperation, regional differences, the interests of the developing world, and the need to sustain the financial viability and basic infrastructures of the National Meteorological and Hydrological Services should be duly respected for the common good of the aviation and meteorological communities. These considerations have indeed been duly recognized and highlighted by the Executive Council of the WMO held just under two weeks ago in Geneva. Inevitably there are differing views and perspectives but I am sure that the wisdom of this community, as demonstrated in the past, will guide us to find the optimal path leading to a new era of aeronautical meteorology.

Together we will make history. Thank you very much.

**LIST OF PARTICIPANTS**

CD – Chief Delegate

ACD – Alternate Chief Delegate

D – Delegate

ALT – Alternate

ADV – Adviser

COBS – Chief Observer

OBS – Observer

(An electronic version is posted on the MET/14 website at  
<http://www.icao.int/meetings/METDIV14/Pages/default.aspx>)

---

## AGENDA OF THE MEETING

- Agenda Item 1: Supporting the “One Sky” concept through the enhancement of meteorological service for international air navigation
- 1.1: The Global Air Navigation Plan (GANP) — a framework for global planning
  - 1.2: Realizing the “One Sky” concept through the GANP framework and Aviation System Block Upgrade (ASBU) methodology
  - 1.3: The meteorological (MET) component of the ASBU methodology
  - 1.4: The need for a restructuring of Annex 3/Technical Regulations [C3.1] and the development of a new PANS-MET to underpin the “One Sky” concept
- Agenda Item 2: Improving the safety and efficiency of international air navigation through enhanced meteorological service provision
- 2.1: Enhancement of existing meteorological service provision to support current strategic, pre-tactical and tactical operational decision-making (including ASBU Module B0-AMET)
  - 2.2: Enhanced integrated meteorological information to support strategic, pre-tactical and tactical operational decision-making from 2018 (including ASBU Module B1-AMET)
  - 2.3: Enhanced integrated meteorological information to support strategic, pre-tactical and tactical operational decision-making from 2028 (including ASBU Module B3-AMET)
  - 2.4: Collaborative decision-making and common situational awareness – automation and human-factors considerations
- Agenda Item 3: Integrating meteorological information exchange developments into the future system-wide information management environment
- 3.1: Meteorological information exchange developments in support of future international air navigation requirements
  - 3.2: Integration of meteorological information in the future system-wide information management (SWIM) environment through the development of new forms of data representation
- Agenda Item 4: Institutional issues
- 4.1: Review of the working arrangements between ICAO and WMO (Doc 7475)
  - 4.2: Other institutional issues
- Agenda Item 5: Standards, Recommended Practices and Procedures
- 5.1: Amendment 77 to Annex 3/Technical Regulations [C3.1]
  - 5.2: Proposed *Procedures for Air Navigation Services — Meteorology* (PANS-MET, Doc xxxx), First Edition (not later than 2019)
  - 5.3: Consequential amendments, if any, to other Annexes or PANS

---

## GLOSSARY OF TERMS

AMHS	ATS message handling system
AFS	aeronautical fixed service
AN-Conf/12	Twelfth Air Navigation Conference
ANSP	air navigation service provider
ASBU	aviation system block upgrade
ATC	air traffic control
ATM	air traffic management
ATMRPP	Air Traffic Management Requirements and Performance Panel
ATS	air traffic services
CTA	controlled time of arrival
ET-M&M	Expert Team on Meteorological Services to ATM and Meteorological Information
GANP	<i>Global Air Navigation Plan (Doc 9750)</i>
GASP	<i>Global Aviation Safety Plan (Doc 10004)</i>
IAVW	International airways volcano watch
IAVWOPSG	International Airways Volcano Watch Operations Group
IROG	inter-regional OPMET gateways
IVATF	International Volcanic Ash Task Force
IUGG	International Union of Geophysics and Geodesy
IWXXM	ICAO meteorological information exchange model
MET	meteorological
METWSG	Meteorological Warnings Study Group
MET/02	Meteorology Divisional Meeting (2002)
MWO	meteorological watch office
PANS	Procedures for Air Navigation Services
PIRGs	planning and implementation regional groups
RHWACS	regional hazardous weather advisory centres
SADISOPSG	Satellite Distribution System Operations Group
SARPs	Standards and Recommended Practices
SADIS	satellite distribution system for information relating to air navigation
SWIM	system-wide information management
TBO	trajectory-based operations



TMA	terminal control area
VASAG	volcanic ash scientific advisory group
W AFC	world area forecast centre
WAFS	world area forecast system
XML/GML	extensible markup language/geography markup language

-----