



# International Civil Aviation Organization

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## METEOROLOGY PANEL (METP)

### FIRST MEETING

Montréal, 20 – 24 April 2015

<h2>REPORT FOLDER</h2>
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*The material in this report has not been considered by the Air Navigation Commission. The views expressed therein should be taken as advice of a panel of experts to the Air Navigation Commission but not as representing the views of the Organization. After the Air Navigation Commission has reviewed this report, a supplement setting forth the action taken by the Air Navigation Commission thereon will be issued to this report.*

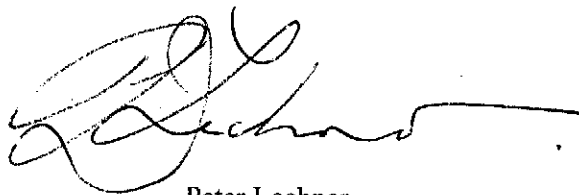
**FIRST MEETING OF THE  
MEETING OF THE METEOROLOGY PANEL (METP) (2015)**

**LETTER OF TRANSMITTAL**

To: President, Air Navigation Commission

From: Chairman, Meeting of the Meteorology Panel (METP)  
(2015)

I have the honour to submit the report of the first meeting of the Meteorology Panel (METP) which was held in Montréal, from 20 to 24 April 2015.

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

Peter Lechner  
Chairman

Montréal, 24 April 2015



## **MEETING OF THE METEOROLOGY PANEL (METP)**

### **FIRST MEETING**

**Montréal, 20 to 24 April 2015**

### **GENERAL**

The attached constitutes the general part of the report and should be inserted at the appropriate place in the yellow folder.

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## MEETING OF THE METEOROLOGY PANEL (METP)

### FIRST MEETING

Montréal, 20 to 24 April 2015

### HISTORY OF THE MEETING

#### 1. DURATION

1.1 The first meeting of the Meeting of the Meteorology Panel (METP) was opened by the President of the Air Navigation Commission in Montréal, at 0930 hours on 20 April 2015. The meeting ended on 24 April 2015.

#### 2. ATTENDANCE

2.1 The meeting was attended by members and observers nominated by fifteen Contracting States and six international organizations, as well as by advisers and others as shown in the list below :

<b>Members</b>	<b>Advisers</b>	<b>Nominated By</b>
Sue O'Rourke	Michael Berechree	Australia
Bill Maynard	Gilles Ratté Brian Grechuk Kent Johnson Éric Dupuis	Canada
Rodrigo Fajardo		Chile
Zhongfeng Zhang	Juan Zou Chi-ming Shun	People's Republic of China
Christiane Givone	Fabien Masson	France
Dirk Engelbart	Klaus Sturm	Germany
Koichiro Kakihara	Jun Ryuzaki	Japan
Peter Lechner		New Zealand
Yuliya Naryshkina	Larisa Nikitina Andrey Kiselev	Russian Federation

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Maluta Tshifaro		South Africa
Colin Hord	Nigel Gait	United Kingdom
Richard J. Heuwinkel	Clinton E. Wallace Thomas J. Helms Jr. Steven Albersheim	United States
Betole Ada Moise		ASECNA
Dennis Hart		EUROCONTROL
Atholl Buchan	Graham Rennie	IATA
Klaus Sievers	Carole Couchman	IFALPA
Dimitar Ivanov	Ian Lisk	WMO
Observers		
Ivan Gonzalez Valdes		Cuba
Stephen Quao		Ghana
Hector Axel Vargas Trolle		Mexico
Matthew Tucker		IFATCA

### 3. OFFICERS AND SECRETARIAT

3.1 Mr. Peter Lechner (New Zealand) and Mr. Bill Maynard (Canada) were elected Chair and Vice-Chair of the panel respectively for a period of three years. Mr. Neil Halsey, Technical Officer (Airport Operations and Interoperability) acted as Secretary for the meeting and was assisted by Mr. Raul Romero, Technical Officer (Airspace Management and Optimization).

### 4. AGENDA OF THE MEETING

4.1 The agenda for the meeting shown hereunder was approved by the Air Navigation Commission:

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Item 1: Opening of the meeting

1a) Explanation of panel functions

Item 2: Election of Chair and Vice-Chair

Item 3: Work programme of the METP

3a) Tasks stemming from the Meteorology Divisional Meeting (2014)

3b) Proposal of job cards

Item 4: Structure of the METP

4a) Working groups of the MET Panel

4b) Selection of rapporteurs of working groups

4c) Membership of working groups

4d) Work programme of working groups

4e) Working methods and meeting schedule of panel and its working groups

Item 5: Coordination with other panels

Item 6: Any other business.

## 5. **WORKING ARRANGEMENTS**

5.1 The panel met as a single body, with ad hoc drafting groups as required. Discussions in the main meeting were conducted in English. Working papers were presented in English only. The report was issued in English.

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METP/1-WP/5  
24/4/15

## **MEETING OF THE METEOROLOGY PANEL (METP)**

### **FIRST MEETING**

**Montréal, 20 to 24 April 2015**

### **AGENDA ITEM 1**

The attached constitutes the report on Agenda Item 1 and should be inserted at the appropriate place in the yellow folder.



**Agenda Item 1: Opening of the meeting**

1.1 The first meeting of the Meteorology Panel (METP) was opened by Mr. Farid Zizi, President of the Air Navigation Commission (ANC).

1.2 Mr. Zizi welcomed the members, advisors and observers to the meeting. He noted that most of the attendees had also been present at the Meteorology Divisional Meeting (2014) which had been held in Montréal from 7 to 18 July 2014 and that as such, many of the participants were familiar with ICAO. The importance of coordination was emphasized within the ICAO system with a clear understanding that the METP would need to work closely with other panels and with the Air Traffic Management Requirements and Performance Panel (ATMRPP) and the Information Management Panel (IMP) in particular. Mr. Zizi expressed confidence in the ability of the METP members to actively coordinate, using the example of the longstanding collaboration with the World Meteorological Organization (WMO) which would also be an essential component for the future development of aeronautical meteorological services. Particular note was made concerning the work of the operations groups which had been a component of the work of ICAO relating to meteorology that was unique. He noted that the ANC would be interested in the views of the panel as to how the operations groups could be integrated into a panel structure or whether the operations groups should continue to exist as separate entities. The notion of not trying to fix things that were already functioning well was stressed. Finally, Mr. Zizi reminded the METP that its members were acting in their capacity as subject matter experts and not representatives of their respective States or international organizations.

1.3 The meeting was also briefly addressed by Mr. Stephen Creamer, Director of the Air Navigation Bureau. Mr. Creamer noted that human factors and meteorology were the two main reasons why the full automation of the aviation system could never take place and that as a consequence there would always be a requirement to enhance the supporting information in order to allow the system as a whole to become safer and more efficient. He stressed that operational implementation was key to the success of the industry and that as a result the relationship between the METP and the other panels of ICAO would be crucial given the finite resources of ICAO and its Contracting States.

**1.4 Explanation of panel functions**

1.4.1 In welcoming the group to the first meeting of the panel it was noted by Mr. Wang, Chief of the Airport Operations and Interoperability (AOI), that many of the members had previously been members of various operations group and/or study group in the field of aeronautical meteorology. It was felt that a brief explanation should be provided to ensure that the formalities involved in the function of an ICAO panel should be understood by all concerned. In order to do this two ICAO documents were introduced and explained. Firstly, the *Directives for Panels of the Air Navigation Commission* (Doc 7984) were introduced which covers the rules and procedures in place for the running of an ICAO panel and secondly, the *Directives to Divisional-type Air Navigation Meetings and Rules of Procedure for their Conduct* (Doc 8143) were introduced. Doc 8143 does not relate directly to the running of a panel but it does contain useful guidance on the formulation of proposals for international Standards, Recommended Practices and Procedures. Following a brief discussion the group agreed that these two documents should remain as links on the METP website to assist members and advisors in the future.

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METP/1-WP/5  
24/4/15

## **MEETING OF THE METEOROLOGY PANEL (METP)**

### **FIRST MEETING**

**Montréal, 20 to 24 April 2015**

### **AGENDA ITEM 2**

The attached constitutes the report on Agenda Item 2 and should be inserted at the appropriate place in the yellow folder.



**Agenda Item 2: Election of Chair and Vice-Chair**

2.1 In nominating Mr. Perter Lechner (New Zealand) as the Chair of the Meteorology Panel (METP), Richard Heuwinkel (United States) noted his ability to be both objective and inclusive thus providing an ideal basis for consensus building which has always been the main focus for ICAO and its expert groups. Mr. Heuwinkel noted that Mr. Lechner had previously acted as the Chair for the recent Meteorology Divisional Meeting (2014), the International Volcanic Ash Task Force (IVATF) and the International Airways Volcano Watch Operations Group (IAVWOPSG) which gives rise to a great deal of confidence in his ability to take on the role as Chair of the METP. This proposal was seconded by Mr. Atholl Buchan (IATA) and was accepted by Mr. Lechner for a period of three years.

2.2 In nominating Mr. Bill Maynard (Canada) as Vice-Chair of the METP, Mr. Colin Hord (United Kingdom) noted once again that Mr. Maynard had previously demonstrated his ability to manage diverse groups towards consensus through his roles as Chair of the Aerodrome Meteorological Observation and Forecast Study Group (AMOFSG), the Meteorological Warnings Study Group (METWSG) and as Vice-Chair of the Meteorology Divisional Meeting (2014). This proposal was seconded by Mrs. Sue O'Rourke (Australia) for a period of three years.

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METP/1-WP/5  
24/4/15

## **MEETING OF THE METEOROLOGY PANEL (METP)**

### **FIRST MEETING**

**Montréal, 20 to 24 April 2015**

### **AGENDA ITEM 3**

The attached constitutes the report on Agenda Item 3 and should be inserted at the appropriate place in the yellow folder.





### Agenda Item 3: Work programme of the METP

#### 1.1 Tasks stemming from the Meteorology Divisional Meeting (2014)

1.1.1 The group undertook a brief review of the twenty-nine recommendations stemming from the Meteorology Divisional Meeting (2014 with a view to determining those recommendations that would require significant work by the panel, or other panels and would therefore require the development of a job card to include such tasks on the work programme.

1.1.2 The titles of the respective recommendations are given in the Table 3.1.

**TABLE 3.1 - LIST OF RECOMMENDATIONS**

1/1	Updating the GANP and ASBU methodology to reflect ASBU MET module dependencies with other modules	Task completed
1/2	Inclusion of a MET-specific module related to Block 2 of the ASBU methodology	Job card 2
1/3	Evolution of aeronautical meteorological service provisions	Job card 3, 6
2/1	Development of the WAFS in support of the ASBU methodology through to 2018	Job card 11
2/2	Operation and further development of the aeronautical fixed service satellite distribution system and the Internet-based services	Job card 5, 9
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	Job card 1, 9
2/4	Review of MET information service provision framework to reflect GANP objectives	Job card 12
2/5	Further development of the WAFS	Job card 11
2/6	Further development of the international airways volcano watch (IAVW)	Job card 4
2/7	Development of provisions for information concerning space weather	Job card 10, 12
2/8	Further development of provisions for information on the release of radioactive material into the atmosphere	Job card 7
2/9	Implementation of a regional advisory system for select en-route hazardous meteorological conditions	Job card 8, 12
2/10	Development of meteorological service for the terminal area	Job cards 2, 3
2/11	Advanced planning relating to the aeronautical meteorological component of ASBU Block 3	Job card 3

2/12	Development of the WAFS in support of the aviation system block upgrades (ASBUs) beyond 2028	Job card 11
2/13	Development of provisions for aeronautical meteorological information services in the context of CDM and common situational awareness	Underlying principle to be borne in mind for all tasks
2/14	Human factors considerations for the development of aeronautical meteorological service provisions	Underlying principle to be borne in mind for all tasks
3/1	Aeronautical meteorological information to support trajectory-based operations	Job card 3
3/2	Inclusion of aeronautical meteorological information in the future SWIM-enabled environment	Job card 5
3/3	Further development of the SWIM concept relating to meteorology	Job card 5
4/1	Review of the working arrangements between ICAO and WMO	Secretariat task
4/2	Definition of meteorological authority	Secretariat editorial task to be presented to METP as part of draft Amendment 78 to Annex 3
4/3	Oversight of aeronautical meteorological service provision	Secretariat task
4/4	Guidance/guidelines on the recovery of costs of aeronautical meteorological service provision	Job card 12
4/5	Evolving competency of aeronautical meteorological personnel	WMO task
4/6	English language proficiency of aeronautical meteorological personnel	Secretariat task
4/7	Provision and use of aeronautical meteorological information for aeronautical purposes only	Secretariat task
5/1	Amendment 77 to Annex 3/Technical Regulations [C.3.1] and consequential amendments to Annex 11, PANS-ABC and PANS-ATM	In progress (Amendment 77 to Annex 3)
5/2	Reorganization of provisions relating to aeronautical meteorology	Job card 6

1.1.3 Following analysis the recommendations from the Meteorology Divisional Meeting it was noted that the tasks could be categorized into three main categories. Firstly, those substantial tasks that would require input from experts, either relating singly to aeronautical meteorology or relating to multiple disciplines where other ICAO panels would need to be involved. These tasks are identified as requiring a proposal for a new job card. Secondly, there are a number of tasks that can be carried out without the need for direct input from the panel other than to note and approve the resulting provisions, as necessary. These tasks were either already completed or allocated to the Secretariat of either ICAO or WMO. Finally, a small number of tasks were identified as underlying principles that while they should be borne in mind throughout the work of the METP they would not be expected to directly require a job card.

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## 1.2 **Proposal of job cards**

1.2.1 Having established the tasks requiring the attention of the METP and thus subject to a job card proposal the panel agreed the following set of job cards:

- a) Testing of the ATS message handling system (AMHS) in relation to the exchange of digital aeronautical meteorological information.;
- b) Development of a MET-specific module related to Block 2 and detailing of the MET-specific module related to Block 1 of the ASBU methodology to cover meteorological information to support ATM in the terminal area;
- c) Aeronautical meteorological information to support ATM operations from gate to gate;
- d) Further development of the International Airways Volcano Watch (IAVW);
- e) Inclusion of aeronautical meteorological information in the SWIM-enabled environment and further development of the SWIM concept relating to meteorology;
- f) Reorganization of provisions relating to aeronautical meteorology;
- g) Further development of provisions for information on the release of radioactive material into the atmosphere;
- h) Implementation of a regional advisory system for select en-route hazardous meteorological conditions;
- i) Further development of the satellite distribution system for information relating to air navigation (SADIS) and the Internet-based services;
- j) Development of provisions for information on space weather to international air navigation
- k) Further development of the World Area Forecast System (WAFS); and
- l) Development of cost-recovery implementation guidance and governance considerations.

1.2.2 The detailed job cards are provided below (Note that MET Divisional Meeting 2014 (Recommendations 2/13 and 2/14 remain underlying principles to be borne in mind for all tasks) :

<b>Title</b>		Testing of the ATS message handling system (AMHS) in relation to the exchange of digital aeronautical meteorological information.	<b>Reference:</b>	1		
<b>Source</b>		MET Divisional Meeting 2014 (Recommendation 2/3 c)				
<b>Problem Statement</b>		The satellite distribution system for information relating to air navigation (SADIS), which is used to disseminate global operational meteorological (OPMET) and world area forecast system (WAFS) information, is expected to be withdrawn before November 2019. Whilst Internet-based facilities are in place for the dissemination of this information there is an urgent need to conduct formal testing of the ATS message handling system (AMHS) to ensure the future global dissemination of this information in an IWXXM compliant format as an initial step towards the future system-wide information management (SWIM) environment.				
<b>Specific Details (including impact statements)</b>		It was recommended by the MET Divisional Meeting (Recommendation 2/3 c) that an appropriate ICAO expert group, undertake, as a matter of urgency, formal testing of the exchange of global OPMET information and WAFS forecasts on the AMHS in an IWXXM compliant format with a view to determining the capability and minimum specifications required to distribute such data to States/users in the future. Priority should be given to testing IWXXM compliant exchange of METAR, SPECI, TAF and SIGMET.				
<b>Expected Benefit</b>		Enable the AMHS for IWXXM compliant meteorological information exchange.				
<b>Reference Documents</b>		ICAO Doc. 10003 - <i>Manual on the Digital Exchange of Aeronautical Meteorological Information</i> ; WMO No. 306, Volume I.3 – <i>Manual on Codes</i> .			Attachments	
<b>Primary Expert Group:</b>		CP				
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	(Action)	Assist ICAO in the coordination of the arrangements between the States/Provider States, international organizations and other stakeholders in order to complete exchange tests as required for the IWXXM compliant exchange of METAR, SPECI, TAF and SIGMET.	METP	Jan 2016		
	(Action)	Assist ICAO in the coordination of the arrangements between the States/Provider States, international organizations and other stakeholders in order to complete exchange tests as required for all IWXXM compliant exchange of OPMET.	METP	On-going	On-going	On-going
Issue Date:		Date Approved by ANC:		Session/Meeting		

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<b>Title</b>	Development of a MET-specific module related to Block 2 and detailing of the MET-specific module related to Block 1 of the ASBU methodology to cover meteorological information to support ATM in the terminal area		<b>Reference:</b>	2		
<b>Source</b>	MET Divisional Meeting 2014 (Recommendations 1/2 and 2/10 a))					
<b>Problem Statement</b>	No specific Block 2 of the ASBU methodology exists relating to meteorology in the Global Air Navigation Plan and specific details for Block 1 on meteorological information to support ATM in the terminal area are missing					
<b>Specific Details (including impact statements)</b>	<p>It was recommended by the MET Divisional Meeting (Recommendation 1/2) that an appropriate ICAO expert group identify the required MET capabilities to support Block 2 related operational improvements of the ASBU methodology, especially considering the introduction of airborne participation in collaborative air traffic management processes and to consider the inclusion of a MET specific module related to block 2.</p> <p>For the Block 2 timeframe, selected airborne based applications will be enabled by fit-for-purpose meteorological information to deliver advanced wake turbulence separation and improved flexibility and efficiency in descent profiles using VNAV, required speed and time at arrival. The improved availability of aircraft-derived-data is a key enabler for this foreseen enhancement either by assessed meteorological parameters by on-boards systems or the derivation of meteorological information from standard parameters downlinked for non-meteorological purposes.</p> <p>In line with recommendation 2/10 a), reference to meteorological information to support ATM in the terminal area in the Block 1 A-MET module could be improved and is integral part of the activity.</p>					
<b>Expected Benefit</b>	Increase safety and efficiency by making full use of enhanced aircraft observations					
<b>Reference Documents</b>	<i>Global Air Navigation Plan (Doc 9750)</i>					Attachments
<b>Primary Expert Group:</b>	METP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Doc 9750	Development of a Block 2 relating to meteorology		May 2017		
	Doc 9750	Proposed updates to Block 1 relating to meteorology to support ATM in the terminal area		May 2017		
Issue Date:		Date Approved by ANC:		Session/Meeting		

<b>Title</b>	Aeronautical meteorological information to support ATM operations from gate to gate		<b>Reference:</b>	3		
<b>Source</b>	MET Divisional Meeting 2014 (Recommendations 1/3, 2/10 b), 2/11 and 3/1)					
<b>Problem Statement</b>	The current provisions of Annex 3 will not support the concept of trajectory-based operations. The needs for supporting meteorological information and service capabilities need to be identified and addressed.					
<b>Specific Details (including impact statements)</b>	<p>It was recommended by the MET Divisional Meeting (Recommendation 3/1) that an appropriate ICAO expert group, in close coordination with WMO, be tasked to finalize a draft concept of operations and roadmap concerning aeronautical meteorological information integration for trajectory-based (TBO) operations and using the result of the roadmap to establish further air traffic management requirements for aeronautical meteorological service capabilities to support TBO consistent with the "One Sky" concept as detailed in the <i>Global Air Navigation Plan</i> (Doc 9750). TBO is a gate-to-gate concept and therefore the recommendation by the MET Divisional Meeting on Development of meteorological service for the terminal area (Recommendation 2/10) forms an integral part of the activities to establish requirements for aeronautical meteorological service capabilities.</p> <p>The aeronautical meteorological information integration for trajectory-based (TBO) operations concept of operations addresses ASBU Block 1, 2 and 3 related improvements of the global air navigation system. The activity to establish further air traffic management requirements for aeronautical meteorological service capabilities to support TBO will initially need to focus on Block 1.</p> <p>For the Block 3 timeframe, further planning is required to make available aeronautical meteorological service capabilities required by 2028 for Module B3-AMET of the ASBU methodology (Recommendation 2/11). Further development should also take into consideration the main legacy tasks from the meteorological aeronautical requirements and information exchange project team (MARIE-PT) that relate to ATM requirements for meteorological information.</p>					
<b>Expected Benefit</b>	Increase the safety and efficiency of trajectory-based operations through the integration of supporting meteorological information.					
<b>Reference Documents</b>	Annex 3 — <i>Meteorological Service for International Air Navigation, Global Air Navigation Plan</i> (Doc 9750), <i>Manual of Aeronautical Meteorological Practice</i> (Doc 8896) , <i>Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services</i> (Doc 9377) <i>Manual on the Digital Exchange of Aeronautical Meteorological Information</i> (Doc 10003)					Attachments
<b>Primary Expert Group:</b>	ATMRPP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3	Provisions for the establishment of air traffic management requirements for aeronautical meteorological service capabilities to support ATM operations Block 1.	METP	Aug.2016	Jul 2018	Nov 18
	Docs 8896, 9377.	Update related guidance material to support the implementation of Annex 3 Amendment.	METP	Aug.2016	Jul 2018	Nov 18
	Annex 11	Provisions for the establishment of air traffic management requirements for the use/integration of aeronautical meteorological information in ATM operations decision support processes.	ATMRPP	Sep.2016	Jul 2018	Nov 18
	Doc 4444	Procedures for the use/integration of aeronautical meteorological information in ATM operations decision support processes.	ATMRPP	Sep.2016	Jul 2018	Nov 18
	Doc #### ('Manual on TBO')	Update related guidance material to support the use/integration of aeronautical meteorological information in trajectory-based operations.				

	Annex 3	Provisions for the establishment of air traffic management requirements for aeronautical meteorological service capabilities to support ATM operations Block 2.	METP	Aug .2020	Jul 2022	Nov 22
	Docs 8896, 9377.	Update related guidance material to support the implementation of Annex 3 Amendment.	METP	Aug.2020	Jul 2022	Nov 22

<b>Title</b>	Further development of the International Airways Volcano Watch (IAVW)		<b>Reference:</b>	4		
<b>Source</b>	MET Divisional Meeting 2014 (Recommendation 2/6)					
<b>Problem Statement</b>	The international airways volcano watch (IAVW) was established to provide notification (via advisory messages, warnings and other notices) to international air navigation regarding the existence of volcanic ash in the atmosphere. The IAVW needs to be maintained and further developed including the integration of the information provided into the future system wide information management (SWIM) in support of the ASBU methodology.					
<b>Specific Details (including impact statements)</b>	<p>The IAVW consists of a number of international arrangements for monitoring the atmosphere and to provide notification to aircraft regarding the existence of volcanic ash in the atmosphere. The system comprises nine volcanic ash advisory centres (VAACs), provided by eight Provider States, tasked to monitor relevant data to detect volcanic ash, to forecast its movement and to provide advisory information to meteorological authorities and other users.</p> <p>It was recommended by the MET Divisional Meeting (Recommendation 2/6) that an appropriate ICAO expert group, in close coordination with WMO, further develop the requirements for the IAVW consistent with the Global Air Navigation Plan (Doc 9750), including the integration of the information produced by the system into the future system wide information management (SWIM) environment using, as a basis, the IAVW roadmap.</p> <p>Further development should take into consideration the main legacy tasks from the international airways volcano watch operations group (IAVWOPSG) that relate to volcanic ash and consider human factors in accordance with recommendation 2/14.</p> <p>This development will be supported by the World Meteorological Organization (WMO) and the International Union of Geophysics and Geodesy (IUGG) scientific support initiatives and forums.</p>					
<b>Expected Benefit</b>	Provide information to support safety risk management of aircraft operations related to areas of VA in the atmosphere and by integrating the VA information produced, under the IAVW, into the SWIM environment in line with the GANP.					
<b>Reference Documents</b>	Annex 3 — <i>Meteorological Service for International Air Navigation, Global Air Navigation Plan (Doc 9750), Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691), Handbook on the International Airways Volcano Watch (Doc 9766), Manual of Aeronautical Meteorological Practice (Doc 8896), Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services (Doc 9377), Meteorology (MET) Divisional Meeting Report (Doc 10045) Agenda Item 2, Appendix C. Roadmap for International Airways Volcano Watch (IAVW) in Support of International Air Navigation.</i>					Attachments
<b>Primary Expert Group:</b>	METP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3 — <i>Meteorological Service for International Air Navigation</i>	Proposals to update Annex 3 to meet current and evolving operational requirements in line with the GANP and to integrate IAVW information into the SWIM.		Sep.2016	Jul 2018	Nov 18
	Regional Air Navigation Plans	Based on Annex 3 amendment, update of the plans as necessary.		Sep.2016	Jul 2018	Nov 18
	Docs 8896, 9377, 9691, 9750 and 9766.	Update related guidance material to support the implementation of Annex 3 Amendment.	WMO (VASAG), WOVO	Sep.2016	Jul 2018	Nov 18
	(Action)	Assist ICAO in the coordination of the arrangements between the States/Provider States, international organizations and other stakeholders comprising the IAVW and in ensuring that the global requirements for IAVW information are met.		On-going	On-going	On-going



<b>Title</b>		Inclusion of aeronautical meteorological information in the SWIM-enabled environment and further development of the SWIM concept relating to meteorology	<b>Reference:</b>	5		
<b>Source</b>		MET Divisional Meeting 2014 (Recommendations 2/2, 3/2 and 3/3)				
<b>Problem Statement</b>		Aeronautical meteorological information needs to be integrated into the SWIM-enabled environment which introduces unique issues relating to governance and data management.				
<b>Specific Details (including impact statements)</b>		<p>It was recommended by the MET Divisional Meeting (Recommendations 2/2, 3/2 and 3/3) that an appropriate ICAO expert group, in close coordination with WMO, develop provisions to enable the inclusion of aeronautical information in the future system-wide information management (SWIM) environment consistent with the Doc 9750, <i>Global Air Navigation Plan</i>. Further principles were also identified to guide the development of the SWIM concept relating to meteorology as provided in Appendix B of Agenda Item 3 of the Meteorology Divisional Meeting 2014 (Doc 10047). The transition from the Internet-based SADISWIFS system is an integral part of these considerations as are the intermediate steps towards full SWIM by making the Annex 3 products IWXXM-compliant.</p> <p>This will involve the resolution of institutional issues that solely relate to the management and use of aeronautical meteorological information and the necessary links between information supporting other domains in the aviation field and in meteorology supported by the World Meteorological Organization.</p> <p>Further development should take into consideration the main legacy tasks from the meteorological aeronautical requirements and information exchange project team (MARIE-PT), Satellite Distribution System for Information Relating to Air Navigation Operations Group (SADISOPSG) and the World Area Forecast System Operations Group (WAFSOPSG) that relate to information exchange.</p>				
<b>Expected Benefit</b>		The full integration of aeronautical meteorological information into the SWIM environment will enable the full benefits to be derived relating to safety and efficiency.				
<b>Reference Documents</b>		ICAO Annex 3 - <i>Meteorological Service for International Air Navigation</i> ICAO Doc. 8896 - <i>Manual of Aeronautical Meteorological Practice</i> ; ICAO Doc. 9750 - <i>Global Air Navigation Plan</i> ; ICAO Doc 10003 - <i>Manual on the Digital Exchange of Aeronautical Meteorological Information</i> ; ICAO Doc. 10045 - <i>Report of the Meteorology Divisional Meeting 2014</i> .			Attachments	
<b>Primary Expert Group:</b>		METP				
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3	Standards for IWXXM compliant METAR, SPECI, TAF and SIGMET exchange		Sep 2016	Jul 2018	Nov 18
	Annex 3	Standards for IWXXM compliant METAR, SPECI, TAF and SIGMET exchange		Sep 2016	Jul 2018	Nov 18
	Annex 3, PANS-MET	Amendment to facilitate the introduction of the meteorological component of SWIM.	IMP	Sep.2016	Jul 2018	Nov 18
	Docs 8896, 10003.	Update related guidance material to support the implementation of Annex 3 Amendments.		Sep.2016	Jul 2018	Nov 18

<b>Title</b>	Reorganization of provisions relating to aeronautical meteorology		<b>Reference:</b>	6		
<b>Source</b>	MET Divisional Meeting 2014 (Recommendations 1/3 and 5/2)					
<b>Problem Statement</b>	In order for meteorological information supporting aviation operations to be integrated into the system-wide information management (SWIM) environment there is a need to migrate related provisions from a product-based viewpoint to an information-based viewpoint leading to a change of emphasis of all of the current provisions of Annex 3; this will also encompass a more clear separation between performance and functional requirements and an improved separation between these requirements and technical specifications (i.e. means of compliance)					
<b>Specific Details (including impact statements)</b>	It was recommended by the MET Divisional Meeting (Recommendation 5/2) that an appropriate ICAO group, in close coordination with WMO, undertake a restructuring of Annex 3 and develop <i>Procedures for Air Navigations Services – Meteorology</i> (PANS-MET). Ensuring that the evolution of aeronautical service provisions is in line with the One-Sky concept as referenced in the <i>Global Air Navigation Plan</i> (GANP) (Doc 9750). The restructuring of the aeronautical meteorological provisions will be in line with the restructuring already underway relating to Annex 15 and PANS-AIM.					
<b>Expected Benefit</b>	The integration of all aeronautical information into the SWIM environment and the alignment of the associated provisions will enable a smooth transition to SWIM and an improved separation between performance and functional requirements and technical specifications will enable a more fit-for-purpose cost effective implementation of provisions.					
<b>Reference Documents</b>	Annex 3 — <i>Meteorological Service for International Air Navigation, Global Air Navigation Plan</i> (Doc 9750), Meteorology (MET) Divisional Meeting Report (Doc 10045) Agenda Item 5, Appendix E. Principles to be followed in the restructuring of Annex 3 and the development of a new PANS-MET.				Attachments	
<b>Primary Expert Group:</b>	METP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3	Restructured document to contain functional and performance requirements		Sep.18	Jul 2020	Nov 20
	(Action)	Develop PANS-MET document including technical specifications		Sep.18	Jul 2020	Nov 20
Issue Date:		Date Approved by ANC:		Session/Meeting		

<b>Title</b>		Further development of provisions for information on the release of radioactive material into the atmosphere	<b>Reference:</b>	7		
<b>Source</b>		MET Divisional Meeting 2014 (Recommendation 2/8)				
<b>Problem Statement</b>		The release of radioactive materials into the atmosphere could pose a risk to aircraft operations and the health of its occupants, air traffic and aerodromes. Recent events highlighted the need to continue and enhance existing international arrangements and procedures. to keep aircraft operations out of areas affected by the release of radioactive material into the atmosphere				
<b>Specific Details (including impact statements)</b>		<p>It was recommended by the MET Divisional Meeting 2014 (Recommendation 2/8) that an appropriate ICAO expert group, in close coordination with WMO, further develop provisions for information on the release of radioactive material into the atmosphere.</p> <p>The development of this task should include the main legacy tasks from the International Airways Volcano Watch Operations Group (IAVWOPSG) that relate to radioactive release. It should be taken into account that further development of provisions should be consistent with the evolving Global Air Navigation Plan (Doc 9750), including integration of the information produced into the future system-wide information management (SWIM) environment underpinning the future globally interoperable air traffic management system.</p> <p>This development will be supported by the World Meteorological Organization (WMO) Commission for Basic Systems (CBS) Expert Team on Emergency Response Activities (ET-ERA) and the International Atomic Energy Agency (IAEA) Inter-Agency Committee on Radiological and Nuclear Emergencies.</p>				
<b>Expected Benefit</b>		To continue and enhance the provision of information on the release of radioactive material into the atmosphere to avoid the risks posed to flight safety by aircraft operations in areas affected by the release. Integrate the information produced into the SWIM environment in line with the GANP.				
<b>Reference Documents</b>		Annex 3 — <i>Meteorological Service for International Air Navigation, Global Air Navigation Plan (Doc 9750), Manual of Aeronautical Meteorological Practice (Doc 8896), Part II, Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services (Doc 9377), Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691), Concept of operations for radioactive material information services in support of international air navigation, 10 December 2012, Draft Version 0.3, Meteorology (MET) Divisional Meeting (2014) Report, Doc 10045.</i>			Attachments	
<b>Primary Expert Group:</b>		METP				
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3 — Meteorological Service for International Air Navigation	Proposals for inclusion in Amendment 78 to Annex 3 to meet operational requirements in line with the GANP and to integrate the information on the release of radioactive material into the atmosphere into the SWIM.		Sep.2016	Jul 2018	Nov 18
	Regional Air Navigation Plans	Based on Annex 3 provisions, update of the plans as necessary.		Sep.2016	Jul 2018	Nov 18
	Docs. 8896, 9377, 9691	Update related guidance material to support the implementation of Annex 3.		Sep.2016	Jul 2018	Nov 18
Issue Date:		Date Approved by ANC:	Session/Meeting			

<b>Title</b>	Implementation of a regional advisory system for select en-route hazardous meteorological conditions	<b>Reference:</b>	8			
<b>Source</b>	MET Divisional Meeting 2014 (Recommendation 2/9)					
<b>Problem Statement</b>	Long-standing deficiencies in the reporting and forecasting of en-route hazardous meteorological conditions have persisted for many years in some regions with an identified need for a phenomenon-based system.					
<b>Specific Details (including impact statements)</b>	<p>It was recommended by the MET Divisional Meeting (Recommendation 2/9) that an appropriate ICAO expert group, in close coordination with WMO, expeditiously develop provisions supporting the implementation of a phenomenon-based regional advisory system for select en-route hazardous meteorological conditions considering users' long-standing requirements for those States where notable SIGMET-related deficiencies persist. Such requirements should be integrated into the SWIM environment with appropriate guidance to support the selection criteria of centres.</p> <p>Further development should take into consideration the main legacy tasks from the Meteorological Warnings Study Group (METWSG) that relate to en-route hazardous meteorological conditions.</p>					
<b>Expected Benefit</b>	Increase safety and efficiency by keeping aircraft operations out of areas of hazardous meteorological conditions.					
<b>Reference Documents</b>	Annex 3 — <i>Meteorological Service for International Air Navigation, Global Air Navigation Plan (Doc 9750), Manual of Aeronautical Meteorological Practice (Doc 8896).</i>				Attachments	
<b>Primary Expert Group:</b>	METP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3	Proposals for inclusion in Amendment 78 to Annex 3 to establish a regional advisory system to meet operational requirements in line with the GANP and to integrate the information on the provision of hazardous weather into the SWIM environment.		Sep.2016	Jul 2018	Nov 18
	Docs 8896	Update related guidance material to support the implementation of Annex 3 Amendment.		Sep.2016	Jul 2018	
	(Action)	Develop criteria necessary for ICAO Regions to select advisory centres		Sep 2016	Jul 2018	
	Regional Air Navigation Plans	Based on Annex 3 provisions, update of the plans as necessary.				
Issue Date:		Date Approved by ANC:	Session/Meeting			

<b>Title</b>		Further development of the satellite distribution system for information relating to air navigation (SADIS) and the Internet-based services	<b>Reference:</b>	9		
<b>Source</b>		MET Divisional Meeting 2014 (Recommendations 2/2 and 2/3 a) and b))				
<b>Problem Statement</b>		The satellite distribution system for information relating to air navigation (SADIS) needs to be managed to ensure that it meets the requirements of States and users through the necessary transition from a satellite-based system to one supported through an Internet-based system for the provision of global OPMET and WAFS information.				
<b>Specific Details (including impact statements)</b>		<p>The SADIS satellite broadcast provides global OPMET and WAFS information to States and users. The satellite broadcast is expected to be terminated with a transition required for all States and users to the use of Internet-based systems that are already in existence.</p> <p>It was recommended by the MET Divisional Meeting (Recommendation 2/2) that an appropriate ICAO expert group be tasked to ensure that the SADIS and the WIFS continue to meet user expectations and further develop in a manner consistent with the <i>Global Air Navigation Plan</i> (Doc 9750). Furthermore Recommendation 2/3 a) and b) call for ICAO to undertake a transition from the satellite-based service to the Internet-based services available. This is to include consideration of the role of SADIS and WIFS within the future system-wide information management (SWIM) environment underpinning the globally interoperable air traffic management system; and alignment with future activities to be undertaken by ICAO in the information management domain.</p> <p>Further development should take into consideration the main legacy tasks from the Satellite Distribution System Operations Group (SADISOPSG)</p>				
<b>Expected Benefit</b>		Continues provision of global OPMET and WAFS information through the transition from a satellite-based system to an Internet-based system.				
<b>Reference Documents</b>		SADIS User Guide			Attachments	
<b>Primary Expert Group:</b>		METP				
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	SADIS User Guide	Based on Annex 3 amendment, update of the plans as necessary.	IMP	Jul 2016		
	(Action)	Assist ICAO in the coordination of the arrangements by the SADIS Provider State in ensuring that the global requirements for the dissemination of global OPMET and WAFS information are met.		Ongoing	Ongoing	Ongoing
Issue Date:		Date Approved by ANC:	Session/Meeting			

<b>Title</b>	Development of provisions for information on space weather to international air navigation		<b>Reference:</b>	10		
<b>Source</b>	MET Divisional Meeting 2014 (Recommendation 2/7)					
<b>Problem Statement</b>	Space weather events such as solar radiation storms, solar flares, geomagnetic storms and ionospheric disturbances that impact earth pose a risk to flight safety, impacting communication, navigation systems, on board avionics and also posing a risk to the health of aircraft occupants.					
<b>Specific Details (including impact statements)</b>	<p>It was recommended by the MET Divisional Meeting (Recommendation 2/7) that an appropriate ICAO expert group, in close coordination with WMO, develop provisions for information on space weather to international air navigation.</p> <p>The development should specifically address:</p> <ul style="list-style-type: none"> <li>a) requirements for space weather information services consistent with the draft concept of operations for space weather information services;</li> <li>b) selection criteria and associated capability for the designation of global and regional space weather centres, including the optimum number thereof;</li> <li>c) appropriate governance and cost recovery arrangements for the provision of space weather information services on a global and regional basis; and</li> <li>d) considerations on the use of space weather information and the various impacts space weather events could have on international air navigation.</li> </ul> <p>It should be taken into account that development of provisions should be consistent with the evolving Global Air Navigation Plan (Doc 9750), including integration of the information produced into the future system-wide information management (SWIM) environment underpinning the future globally interoperable air traffic management system.</p> <p>This development will be supported by the World Meteorological Organization (WMO) Inter-Programme Coordination Team on Space Weather.</p>					
<b>Expected Benefit</b>	To provide information on space weather and to avoid the risks posed to flight safety regarding communications, navigation (including the global positioning system (GPS)) and avionics, as well the risk to the health of aircraft occupants (i.e. flight crew and passengers) due to radiation exposure. Integrate the information produced into the SWIM environment in line with the GANP.					
<b>Reference Documents</b>	Annex 3 — <i>Meteorological Service for International Air Navigation, Global Air Navigation Plan (Doc 9750), Manual of Aeronautical Meteorological Practice (Doc 8896), Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services (Doc 9377)</i> , Concept of operations for space weather information in support of international air navigation, 6 December 2013, Draft version 3.0, Meteorology (MET) Divisional Meeting (2014) Report, Doc 10045.				Attachment	
<b>Primary Expert Group:</b>	METP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3— Meteorological Service for International Air Navigation	Initial proposals for inclusion in Amendment 78 to Annex 3 to meet operational requirements in line with the GANP and to integrate space weather information into the SWIM.	NSP	Sep.2016	Jul 2018	Nov 18
	(Action)	Finalize the concept of operations and associated roadmap		Sep 2016	Jul 2018	Nov 18
	Regional Air Navigation Plans	Based on Annex 3 provisions, update of the plans as necessary.		Sep.2016	Jul 2018	Nov 18
	Docs. 9750, 8896, 9377	Initial related guidance material to support the implementation of Annex 3. New user Manual.	WMO (ICTSW),	Sep.2016	Jul 2018	Nov 18

Issue Date:	Date Approved by ANC:	Session/Meeting
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<b>Title</b>	Further development of the World Area Forecast System (WAFS)		<b>Reference:</b>	11		
<b>Source</b>	MET Divisional Meeting 2014 (Recommendations 2/1, 2/4 b) i), 2/5 and 2/12)					
<b>Problem Statement</b>	The world area forecast system (WAFS) is a worldwide system established to provide aeronautical meteorological en-route forecasts in uniform standardized formats. The WAFS needs to be maintained and further developed, including the integration of the information provided into the future system wide information management (SWIM), in support of the aviation system block upgrade (ASBU) methodology.					
<b>Specific Details (including impact statements)</b>	<p>The WAFS consists of the provision of global aeronautical meteorological en-route WAFS forecasts in digital form to meteorological authorities and other users on a global basis by two Provider States. The WAFS information is made available via one satellite distribution system for information relating to air navigation (SADIS) and two Internet-based services (the Secure SADIS FTP Service and the WAFS Internet File Service (WIFS)).</p> <p>It was recommended by the MET Divisional Meeting (Recommendations 2/5, 2/5 and 2.12) that an appropriate ICAO expert group, in close coordination with WMO, further develop the requirements for the WAFS consistent with the Global Air Navigation Plan (Doc 9750), including the integration of the information produced by the system into the future system wide information management (SWIM) environment.</p> <p>Further development should take into consideration the main legacy tasks from the world area forecast system operations group (WAFSOPSG) such the provision of guidance concerning the operation of the WAFS and its effectiveness in meeting current and future operational requirements. It was further recommended by the MET Divisional meeting (recommendation 2/4 b) iv)) that this include the development of guidance for States concerning how their ICAO obligations may be met in the context of local, subregional, regional, multi-regional and global MET, including cost recovery and governance considerations.</p>					
<b>Expected Benefit</b>	Keep the system operational and integrate the information produced by WAFCs into the SWIM environment in line with the GANP maintaining and increasing flight efficiency and safety.					
<b>Reference Documents</b>	Annex 3 — <i>Meteorological Service for International Air Navigation, Global Air Navigation Plan (Doc 9750), Manual of Aeronautical Meteorological Practice (DOC 8896), Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services (Doc 9377), Meteorology (MET) Divisional Meeting Report (Doc 10045) Agenda Item 2, Appendices A, B and F, WAFSOPSG Deliverables (tasks), SADIS User Guide, WIFS User Guide and guidance material available at the WAFSOPSG Website.</i>					Attachments
<b>Primary Expert Group:</b>	METP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates		
				Expert Group	Effective	Applicability
	Annex 3	Proposals for inclusion in Amendment 78 to Annex 3 to meet operational requirements in line with the GANP and to integrate WAFS information into the SWIM environment.	ATMRP Flight Ops	Sep.2016	Jul 2018	Nov 18
	Regional Air Navigation Plans	Based on Annex 3 amendment, update of the plans as necessary.		Sep.2016	Jul 2018	Nov 18
	Docs. 9750, 8896 and 9377 , SADIS User Guide, WIFS User Guide	Update related guidance material to support the implementation of Annex 3 Amendment.		Sep.2016	Jul 2018	Nov 18
	(Action)	Assist ICAO in the coordination of the arrangements between the Provider States comprising the WAFS and in ensuring that the global requirements for WAFS information are met.		On-going	On-going	On-going



<b>Title</b>		Development of cost-recovery implementation guidance and governance considerations		<b>Reference:</b>	12		
<b>Source</b>		MET Divisional Meeting 2014 (Recommendation 2/4, 2/7, 2/9 and 4/4)					
<b>Problem Statement</b>		MET services are being provided at a range of scales (local, sub-regional, regional, multi-regional or global). When these services are provided in a sub-regional, regional, multi-regional or global context there is a lack of suitable guidance with respect to applicable cost-recovery mechanisms.					
<b>Specific Details (including impact statements)</b>		It was recommended by the MET Divisional Meeting that an appropriate ICAO expert group should develop appropriate guidance on the cost recover aspects of sub-regional, regional, multi-regional or global service provision as one of the essential governance aspects of MET service provision that need to be reviewed.					
<b>Expected Benefit</b>		Enable MET service provision to be provided at an appropriate scale to enable greater efficiency of operations and ensure that governance and associated cost recovery issues are resolved including aspects on the required core MET infrastructure.					
<b>Reference Documents</b>		<i>Manual on Air Navigation Services Economics</i> (Doc 9161)				Attachments	
<b>Primary Expert Group:</b>		METP					
WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates			
				Expert Group	Effective	Applicability	
	Doc 9161	Update	ATB/ANSEP				
Issue Date:		Date Approved by ANC:		Session/Meeting			

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METP/1-WP/5  
24/4/15

## **MEETING OF THE METEOROLOGY PANEL (METP)**

### **FIRST MEETING**

**Montréal, 20 to 24 April 2015**

### **AGENDA ITEM 4**

The attached constitutes the report on Agenda Item 4 and should be inserted at the appropriate place in the yellow folder.



**Agenda Item 4: Structure of the METP**

1.1 The panel in noted the extensive work programme as indicated under agenda item 3. In order to provide the highest level of clarity the panel agreed that the most efficient way of describing the agreed working groups together with the detailed information concerning the selection of rapporteurs, membership of working groups, work programme of the working groups, the working methods and meeting schedule of each working group is to reflect the information in the form of tables for each of the groups. Corresponding to this agreement, all of the sub-agenda items 4.1 to 4.5 are reflected in the following tables.

1.2 In this respect the panel agreed that the work programme of the panel would best be carried out with the formation of four working groups as given below:

- a) Meteorological requirements and integration (MRI);
- b) Meteorological information and service development (MISD);
- c) Meteorological information exchange (MIE); and
- d) Meteorological operations groups (MOG).

1.3 The four tables below provide a summary description of the four working groups, their membership and initial work plans (The work described in Job Card 12, Development of cost-recovery implementation guidance and governance considerations, will be attended to by a small ad-hoc group working with the Chairman of the MET Panel):



## ICAO METEOROLOGY PANEL WORKING GROUP ON MET Requirements & Integration (WG-MRI)

### WORK PLAN

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## 2. JOB CARD & RECOMMENDATIONS

MET Panel Job Card	MET/14 Recommendations
#2; Development of a MET-specific module related to Block 2 and detailing of the MET-specific module related to Block 1 of the ASBU methodology to cover meteorological information to support ATM in the terminal area	1/2, 2/10 a)
#3; Aeronautical meteorological information to support ATM operations from gate to gate	1/3, 2/10 b), 2/11 <sup>1</sup> , 3/1
#6; Reorganization of provisions relating to aeronautical meteorology	1/3, 5/2

## 3. PLANNED MEETINGS

- 1) Meeting 2015/1 (WebEx): May 19<sup>th</sup> 12:00utc 2015
- 2) Meeting 2015/2 (F2F): November 3<sup>rd</sup>-6<sup>th</sup> 2015 Montreal
- 3) Meeting 2016/1 (F2F): October 2016 (planned METP meeting)
- 4) Meeting 2017/1 (F2F or WebEx): October/November 2017 (aligned with ATMRPP meeting)

## 4. WORK PLAN

Activity / Milestone	Assigned to	Predecessor activity	Date	Status
<b>Activity 1: MET for TBO Concept Finalisation (Job Card #3)</b>				
Activity 1.1: Draft MET for TBO Concept v0.4.0 development ( <i>ref. MET/14 Recc. 1/3, 2/10 b, 3/1</i> )	Dennis		July 2015	
Activity 1.2: MET for TBO Concept final version development ( <i>ref. MET/14 Recc. 1/3, 2/10 b, 3/1</i> )	Dennis	Activity 1.1	October 2015	
<b>Activity 2: MET for TBO Requirement Development (Job Card #3)</b>				
Activity 2.1: Functional requirements document for MET information to support selected Block 1 modules ( <i>ref. MET/14 Rec. 1/3, 2/10 b, 3/1</i> )	Rick		May 2016	

<sup>1</sup> For MET/14 Recommendation 2/11 no activities are defined, this element will be discussed and defined during the execution of activity 2.3 and 2.4.

Activity 2.2: Draft provisions for MET support to selected Block 1 modules ( <i>ref. MET/14 Recc. 1/3, 2/10 b, 3/1</i> )	Rick	Activity 2.1	August 2016	
Activity 2.3: Functional requirements document for MET information to support selected Block 2 modules ( <i>ref. MET/14 Recc. 1/3, 2/10 b, 3/1</i> )	Rick		Mid 2019	
Activity 2.4: Draft provisions for MET support to selected Block 2 modules ( <i>ref. MET/14 Recc. 1/3, 2/10 b, 3/1</i> )	Rick	Activity 2.3	Mid 2020	
<b>Activity 3: ASBU A-MET Module Updates (Job Card #2)</b>				
Activity 3.1: Description Block 2 A-MET module for inclusion in update of GANP ( <i>ref. MET/14 Recc. 1/2</i> )	Dennis		May 2017	
Activity 3.2: Description improvement on terminal area aspects of Block 1 A-MET ( <i>ref. MET/14 Recc. 2/10 a</i> )	Stéphanie		May 2017	
<b>Activity 4: Annex 3 review and PANS-MET development (Job Card #6)</b>				
Activity 4.1: Defined scope of documents under consideration for modernisation	Michael		April 2016	
Activity 4.2: Transposition principles for PANS-MET and revised Annex 3 ( <i>ref. MET/14 Recc. 1/3, 5/2</i> )	Michael	Activity 4.1	April 2016	
Activity 4.3: Strawman version PANS-MET and revised Annex 3 ( <i>ref. MET/14 Recc. 1/3, 5/2</i> )	Michael	Activity 4.2	September 2017	
Activity 4.4: Final proposed version PANS-MET and revised Annex 3 ( <i>ref. MET/14 Recc. 1/3, 5/2</i> )	Michael	Activity 4.3	September 2018	



## ICAO METEOROLOGY PANEL WORKING GROUP ON MET Information and Service Development (WG-MISD)

### WORK PLAN SUMMARY

1. MEMBERSHIP		
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## 2. JOB CARD & RECOMMENDATIONS

MET Panel Job Card	MET/14 Recommendations
#4 Further development of the International Airways Volcano Watch (IAVW)	2/6
#7 Further development of provisions for information on the release of radioactive material into the atmosphere	2/8
#8 Implementation of regional advisory system for select en-route hazardous meteorological conditions	2/9 (2/4 and 4/4)
#10 Development of provisions for information on space weather to international air navigation	2/7
#11 Further development of the World Area Forecast System	2/5, 2/12 (2/4 b) i))

## 3. PLANNED MEETINGS

- 1) Meeting 2015/1 (WebEx): 4 June 2015, 11:00 UTC
- 2) Meeting 2015/2 (WebEx): July 2015, 11:00 UTC
- 3) Meeting 2015/3 (WebEx): September 2015, 11:00 UTC
- 4) Meeting 2015/4 (F2F): 2-6 November 2015, Montreal (in conjunction with WG-MRI)
- 5) Meeting 2015/5 (WebEx): December 2015, 11:00 UTC
- 6) Meeting 2016/1 (F2F): May 2016, Montreal

7) Meeting 2016/2 (F2F): October 2016 (planned METP meeting)
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<b>4. WORK PLAN</b>				
<b>Activity / Milestone</b>	<b>Assigned to</b>	<b>Predecessor activity</b>	<b>Date</b>	<b>Status</b>
<b>Activity 1: Release of Radioactive Material</b>				
Activity 1.1: Draft Concept of Operations for the provision of information about the release of radioactive material	D Engelbart		December 2015	
Activity 1.2: Updated Concept of Operations for the provision of information about the release of radioactive material	D Engelbart	Activity 1.1	May 2016	
Activity 1.3: Release of radioactive material information performance requirements for endorsement by the MET Panel		Activity 1.2	June 2016	
Activity 1.4: Revised guidance on the provision of information about the release of radioactive material		Activities 1.2 and 1.3	TBD	
Activity 1.5: Proposals for Amendment of ICAO Annex 3 with respect to release of radioactive material into the atmosphere for endorsement by the MET Panel		Activity 1.3	September 2016	
<b>Activity 2: Regional Hazardous Weather Advisory Centers</b>				
Activity 2.1: Concept of Operations for warning services for hazardous weather in support of international air navigation for endorsement by the MET Panel	CM Shun		September 2016	
Activity 2.2: Guidance for warning services for hazardous weather in support of international air navigation for endorsement by the MET Panel		Activity 2.1	September 2017	
Activity 2.3: Annex 3 provisions and guidance material for warning services for hazardous weather in support of international air navigation for endorsement by the MET Panel		Activity 2.1	September 2018	
Activity 2.4: Regional Hazardous Weather Advisory Centers implemented by PIRGs		Activity 2.3	TBD	
Activity 2.5: Report on review of feasibility of centralization of SIGMET provision by regional centers for endorsement by the MET Panel			September 2020	
Activity 2.6: Annual inputs on the review of global, regional, sub-regional, and local service provision to the MET Panel			Annually in May	

<b>Activity 3: Space Weather Information</b>				
Activity 3.1: Revised Space Weather Concept of Operations for endorsement by METP	S Albersheim		May 2016	
Activity 3.2: Space Weather information performance requirements for endorsement by the MET Panel	S Albersheim		June 2016	
Activity 3.3: Space Weather Center selection criteria for endorsement by the MET Panel	S Albersheim		July 2016	
Activity 3.4: Proposals for Amendment of ICAO Annex 3 with respect to space weather information	S Albersheim		September 2016	
Activity 3.5: Space Weather Information Manual			September 2017	
<b>Activity 4: Volcanic Ash Information</b>				
Activity 4.1: Update IAVW Roadmap for endorsement by MET Panel	S Albersheim		May 2016	
Activity 4.2: Requirements for volcanic ash information in ASBU Block 0 (2013-18), not addressed by WG-MOG	S Albersheim		June 2016	
Activity 4.3: Requirements for volcanic ash information in ASBU Block 1 (2018-23)			June 2018	
Activity 4.4: Proposals for Amendment of ICAO Annex 3 with respect to volcanic ash information		Activity 4.3	September 2018	
Activity 4.5: Requirements for volcanic ash information in ASBU Block 2 (2023-28)			June 2022	
Activity 4.6: Proposals for Amendment of ICAO Annex 3 with respect to volcanic ash information		Activity 4.5	September 2022	
<b>Activity 5: World Area Forecast System</b>				
Activity 5.1: Requirements for WAFS information in ASBU Block 0 (2013-18), not addressed by WG-MOG	M P Murphy		September 2016	
Activity 5.2: Requirements for WAFS information in ASBU Block 1 (2018-23)	M P Murphy		June 2018	
Activity 5.3: Proposals for Amendment of ICAO Annex 3 with respect to WAFS		Activity 5.2	September 2018	
Activity 5.4: Requirements for WAFS information in ASBU Block 2 (2023-28)			June 2022	
Activity 5.5: Proposals for Amendment of ICAO Annex 3 with respect to WAFS		Activity 5.4	September 2022	



## ICAO METEOROLOGY PANEL WORKING GROUP ON METEOROLOGICAL INFORMATION EXCHANGE (WG-MIE)

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<b>2. JOB CARD &amp; RECOMMENDATIONS</b>	
<b>METP Job Card</b>	<b>MET/14 Recommendations</b>
#1 - Testing of the ATS message handling system (AMHS) in relation to the exchange of digital aeronautical meteorological information.	Recommendation 2/3 c) - ... formal testing of the exchange of global OPMET information and WAFS forecasts on the AMHS.
#5 - Inclusion of aeronautical meteorological information in the SWIM-enabled environment and further development of the SWIM concept relating to meteorology	<p>Recommendation 3/2 - Inclusion of aeronautical meteorological information in the future SWIM-enabled environment.</p> <p>Recommendation 3/3 - Further development of the SWIM concept relating to meteorology.</p> <p>Recommendation 2/2 - Operation and further development of the aeronautical fixed service satellite distribution system and the Internet-based services.</p>

<b>3. PLANNED MEETINGS</b>
<p>Establishment Meeting 23-24 April 2015</p> <p>Teleconference of WG members:</p> <ol style="list-style-type: none"> <li>1) June 2015</li> <li>2) September 2015</li> <li>3) December 2015</li> <li>4) March 2016</li> <li>5) June 2016</li> </ol> <p>Meeting in conjunction with IMP or CR.</p> <p>Meeting in conjunction with METP in October 2016</p>

<b>4. WORK PLAN SUMMARY</b>	
<b>Activity / Milestone</b>	<b>Date</b>
<b>Activity 1: Establishment of Working Group &amp; Workplan</b>	
Milestone 1: Working group & workplan complete	Jun 2015
<b>Activity 2: AMHS Testing of OPMET Data (Job Card 1)</b>	
Milestone 2: Report on AMHS testing of OPMET data	Jan 2016
<b>Activity 3: iWXXM Implementation Guidance (Job Card 1)</b>	
Milestone 3: Guidance on iWXXM implementation complete	Mar 2016
<b>Activity 4: AMHS Testing of WAFS Data (Job Card 1)</b>	
Milestone 4: Report on AMHS testing of WAFS data	May 2016
<b>Activity 5: AMHS Testing of other MET Data (Job Card 1)</b>	
Milestone 5: Report on AMHS testing of other MET data	May 2016

<b>Activity 6: iWXXM Standards for METAR, SPECI, TAF, SIGMET</b>	
Milestone 6: Standards for iWXXM compliant METAR, SPECI, TAF, SIGMET complete	Aug 2016
<b>Activity 7: iWXXM Recommended Practices for WAFS and other MET Information</b>	
Milestone 7: Recommended Practices for iWXXM compliant WAFS and other MET Information	Aug 2016
<b>Activity 8: MET-in-SWIM ConOps (Job Card 2)</b>	
Milestone 8: MET-in-SWIM ConOps complete	Jul 2018
<b>Activity 9: MET-in-SWIM Roadmap (Job Card 2)</b>	
Milestone 9: MET-in-SWIM roadmap complete	Jul 2019
<b>Activity 10: MET-in-SWIM Provisions (Job Card 2)</b>	
Milestone 10: MET-in-SWIM provisions complete	Sep 2020
<b>Activity 11: MET-in-SWIM Guidance Material (Job Card 2)</b>	
Milestone 11: MET-in-SWIM guidance material complete	Sep 2020



## ICAO METEOROLOGY PANEL WORKING GROUP ON MET OPERATIONS GROUP (WG-MOG)

### WORK PLAN SUMMARY

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## 2. JOB CARD & RECOMMENDATIONS

MET Panel Job Card	MET/14 Recommendations
# 9	Termination of SADIS Satellite Broadcast

## 3. PLANNED MEETINGS

<ol style="list-style-type: none"> <li>1) Meeting 2015/1 (WebEx) SADIS and WAFS July 2015</li> <li>2) Meeting 2015/2 (F2F): SADIS and WAFS tentatively planned for Gatwick 8-11 September 2015</li> <li>3) Meeting 2015/3 (WebEx) VAACs November 2015</li> <li>4) Meeting 2016/1 (F2F): VAACs tentatively planned for Buenos Aires May 2016</li> <li>5) Meeting 2016/2 (F2F): October 2016 (planned METP meeting)</li> </ol>
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## 4. WORK PLAN

Work stream	Reference	Predecessor activity	Date	Status
<b>Work stream 1: SADIS/WIFS</b>				
Activity 1.1: Alignment of the OPMET content of SADIS and WIFS	19/7	SADISOPSG/19		Open
Activity 1.2: Revision to Annex 1 to the SADIS User Guide (SUG) concerning OPMET information from non-AOP aerodromes	19/9	SADISOPSG/19		Open



Activity 1.3: Maintenance of information containing WMO abbreviated header lines for SIGMET and advisories	19/10	SADISOPSG/19		Open
Activity 1.4: Review of the SADIS Gateway Operations Handbook OPMET monitoring requirements	19/11	SADISOPSG/19		Open
Activity 1.5: Review of the provision of concatenated data files containing WAFS GRIB2 bulletins on Secure SADIS FTP	19/16	SADISOPSG/19		Open
Activity 1.6: Feasibility study into making area forecasts for low-level flights issued in graphical form available on Secure SADIS FTP.	19/26	SADISOPSG/19		Open
Activity 1.7: Structure of Annex 3 of the SADIS User Guide	19/27	SADISOPSG/19		Open
<b>Work stream 2: WAFS</b>				
Activity 2.1: Implementation of WAFS re-issuance policy for WAFS GRIB2 and WAFS SIGWX forecasts	7/5	WAFSOPSG/8		Open
Activity 2.2: Quality management of ADS reports relating to meteorological information	7/19	WAFSOPSG/8		Open
Activity 2.3: Future verification of WAFS gridded global forecasts of cumulonimbus (CB) clouds, icing and turbulence	8/10	WAFSOPSG/8		Open
Activity 2.4: Investigation of enhanced verification of WAFS gridded global forecasts for cumulonimbus (CB) clouds, icing and turbulence using additional sources of observation	8/11	WAFSOPSG/8		Open
Activity 2.5: Further development of WAFS gridded global forecasts	8/12	WAFSOPSG/8		Open
Activity 2.6: Cessation of WMO support for BUFR Edition 3 and implications for the WAFS SIGWX forecasts	8/14	WAFSOPSG/8		Open
Activity 2.7: Roadmap for global meteorological information and integration in the context of the WAFS that supports the Aviation System Block Upgrades (ASBUs)	8/16	WAFSOPSG/8		Open
<b>Work stream 3: IAVW</b>				
Activity 3.1: Increased use of the VONA template by volcano observatories and list of volcanoes that threaten aviation	6/23	IAVWOPSG/8		Open
Activity 3.2: Situational awareness for aviation operators	7/13	IAVWOPSG/8		Open
Activity 3.3: Expressing confidence at the time of observation of an ash cloud (T+0 hours) in the volcanic ash advisory/volcanic ash advisory in graphical format (VA Advisory/VAG)	7/19	IAVWOPSG/8		Open

Activity 3.4: Evaluation of forecast confidence to meet the needs of volcanic ash related safety risk assessments	7/20	IAVWOPSG/8		Open
Activity 3.5: Common web page for VAACs	7/22	IAVWOPSG/8		Open
Activity 3.6: Aerosol observations exchange	7/23	IAVWOPSG/8		Open
Activity 3.7: Health risks to aircraft occupants posed by sulphur dioxide and other hazardous gases in the atmosphere	7/34	IAVWOPSG/8		Open
Activity 3.8: Use of infrasound data in support of the IAVW	7/36	IAVWOPSG/8		Open
Activity 3.9: Agreed in-situ and/or remote sensing techniques for discernible ash	8/3	IAVWOPSG/8		Open
Activity 3.10: Expansion of the collaborative decision analysis and forecasting process to allow its application to all significant volcanic events	8/7	IAVWOPSG/8		Open
Activity 3.11: Model chart for SIGMET for volcanic ash in graphical format	8/9	IAVWOPSG/8		Open
Activity 3.12: Coverage of the unmonitored area north of the area of responsibility of VAAC Tokyo	8/12	IAVWOPSG/8		Open
Activity 3.13: Assessment of the feasibility of the establishment of a volcanology desk	8/14	IAVWOPSG/8		Open
Activity 3.14: Update of Model VAG and Model SVA of Appendix 1 to Annex 3	8/16	IAVWOPSG/8		Open
Activity 3.15: Trial product for volcanic ash information at T+24 hours	8/18	IAVWOPSG/8		Open
Activity 3.16: Trial of operational allocation of forecast confidence in the production of VA advisories	8/19	IAVWOPSG/8		Open
Activity 3.17: Further improvement of the dissemination of aircraft reports of volcanic ash to VAACs	8/21	IAVWOPSG/8		Open
Activity 3.18: Progress regarding aerosol observation capabilities and related activities		IAVWOPSG/8		Open
Activity 3.19: Collection and sharing of engineering and/or technical data from aircraft encountering the Kelut volcanic ash cloud		IAVWOPSG/8		Open

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METP/1-WP/5  
24/4/15

## **MEETING OF THE METEOROLOGY PANEL (METP)**

### **FIRST MEETING**

**Montréal, 20 to 24 April 2015**

### **AGENDA ITEM 5**

The attached constitutes the report on Agenda Item 5 and should be inserted at the appropriate place in the yellow folder.



**Agenda Item 5: Coordination with other panels**

5.1 The panel noted that many aspects of the future development of aeronautical meteorological requirements will increasingly depend upon active collaboration with the user communities. To this end much of the work of the working groups described under agenda item 4 will need to be coordinated through other ICAO bodies and user organizations. These coordination roles are indicated in the job cards as described under agenda item 3 but with specific emphasis on linkage between the METP working groups and other ICAO panels as given below:

- a) WG-MRI coordination with the Air Traffic Management Requirements and Performance Panel (ATMRPP); and
  - b) WG-MIE coordination with the Communications Panel (CP) and the Information Management Panel (IMP).
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METP/1-WP/5  
24/4/15

## **MEETING OF THE METEOROLOGY PANEL (METP)**

### **FIRST MEETING**

**Montréal, 20 to 24 April 2015**

### **AGENDA ITEM 6**

The attached constitutes the report on Agenda Item 6 and should be inserted at the appropriate place in the yellow folder.



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**Agenda Item 6: Any other business**

1.1 The Panel noted that the Meteorology Divisional Meeting (2014), held in Montréal from 7 to 18 July 2014, in its Recommendation 2/3 a) had tasked ICAO to undertake the necessary steps to extend the SADIS satellite broadcast beyond 2015 but not beyond November 2019.

1.1 Since that meeting it had been made known that the satellite currently used to provide the service would be replaced in July 2016 and that the replacement satellite would not have the capability to use the frequencies that were currently in place.

1.2 The Panel noted that the circumstances had been made known to the SADIS Provider State the Satellite Distribution System Operations Group (SADISOPSG) through correspondence and an information briefing had been provided to all members of that group. Following this briefing the SADISOPSG had been asked to consider their views concerning whether the satellite broadcast should be continued (through a replacement satellite using different frequencies) or whether the broadcast should be discontinued from July 2016 leaving the Internet-based FTP service as the source of global OPMET and WAFS information from the SADIS Provider State. The main issues concerned the need for software and hardware upgrades for all recipients of information through the SADIS satellite broadcast which would be necessary if a new satellite were utilized through different broadcast frequencies. The costs of such a change would need to be balanced with the alternative of terminating the broadcast in July 2016 and requiring user and States to use the Internet-based services to receive the information ahead of the previously planned timelines, i.e. 2019. Detailed information concerning the options and their associated costs were also provided by the SADIS Provider State.

1.3 In response to the discussions described above the Panel noted that the members of the SADISOPSG had decided that the best course of action was to terminate the broadcast in July 2016. It was noted that two members of the SADISOPSG were not in agreement with this decision and that others had noted the need to provide assistance or guidance to those developing States in order to transition to the use of the Internet-based service by July 2016. It was noted that the Secure SADIS FTP service would continue, and would be unaffected by changes to SADIS 2G. Existing users of SADIS 2G who do not currently have access to Secure SADIS FTP are encouraged to transition to Secure SADIS FTP in advance of the cessation of the SADIS 2G transmissions. As a result of the above the Panel is agreed with the decision of the SADISOPSG and to formulated the following recommendation:

**Recommendation 1/1 — Termination of the SADIS satellite broadcast**

That the SADIS Provider State make the necessary arrangements to allow the termination of the SADIS satellite broadcast from 31 July 2016.

— END —