



**Agenda Item 5: Review of Project H5 – MET service improvements in accordance with the new operational requirements in support of ATM**

**Analysis of ATM requirements and the ASBU methodology**

(Presented by the Secretariat)

<b>SUMMARY</b>	
<p>This working paper describes the importance of disseminating timely and quality meteorological products in support of ATM operations and their link with the requirements of the Global Air Navigation Plan, the ATM operational concept, and the aviation system block upgrades (ASBU). It also analyses the first activities of Project H5, which seeks to generate new products for ATM based on the above.</p>	
<b>References:</b>	
<ul style="list-style-type: none"><li>• Annex 3- <i>Meteorological service for international air navigation</i></li><li>• Doc 9750 – Global air navigation plan</li><li>• Doc 10045 – Report of the Meteorology Divisional Meeting (2014)</li><li>• Doc 9854 – ATM operational concept</li><li>• CAR and SAM Performance-based air navigation implementation plans</li><li>• Report of the Fourth meeting of the ICAO MET Panel</li><li>• Report of the Second meeting on GREPECAS MET Projects</li></ul>	
<b>ICAO strategic objectives:</b>	<i>A – Safety</i> <i>B – Air navigation capacity and efficiency</i> <i>E – Environmental protection</i>

1. **Introduction**

1.1 The Meteorology Divisional Meeting (2014) (MET/14) discussed, under various items, the ASBU modules in which MET information would be important.

1.2 Regarding the components of the operational concept, ICAO Doc 9854 underlines that the provision of meteorological information is a function of the ATM system and that information must meet ATM requirements in terms of content, format and timing.

1.4 The SAM Region drafted its Performance-based air navigation implementation plan taking into account the ICAO Global Air Navigation Plan (GANP) (Doc. 9750), within the context of the Aviation System Block Upgrade (ASBU) methodology, with a view to achieving a more efficient and interoperable airspace to meet future capacity demand, without jeopardising safety.

1.5 The MP/2 meeting reviewed Project H5, and the PPRC/4 meeting approved the proposal.

## 2. Discussion

### ATM operational concept and meteorological information

2.1 According to the ATM operational concept, the main benefits provided by meteorological information to the ATM system are as follows:

- a) the availability of more accurate and timely meteorological information will allow for optimised flight path planning and forecasting, thus improving the safety and efficiency of the ATM system;
- b) the increased availability of shared meteorological information on board the aircraft will permit real-time adjustment of the preferred path;
- c) a better identification, forecasting and display of adverse meteorological conditions will make it possible to address their effects more efficiently, thus improving safety and flexibility; for example, accurate and timely information on the need for a diversion or re-routing will be available;
- d) improved aerodrome reports and forecasts will facilitate optimum use of available aerodrome capacity;
- e) a better availability of meteorological information (air-reports) from airborne meteorological sensors will contribute to better meteorological forecasts and their display in real-time; and
- f) meteorological information will help minimise the effect of air traffic on the environment.

### Aviation system block upgrades (ASBU)

2.2 Meteorological information is part of the future system-wide information management environment, together with aeronautical information, flight and flow information, and other sources of information. As meteorological information makes the transition from the current largely gridded, binary, alphanumeric and graphical formats to the future unpatented, interoperable code forms (such as XML/GML), using new exchange models, such as the meteorological information exchange model (WXXM), there is great potential for improving the safety and efficiency of the global air traffic management system (ATM) through greater availability and use of meteorological information.

2.3 The Meteorology Divisional Meeting (MET/14) identified the ASBU modules in which MET information was important. **Appendix A** shows the different modules identified in all the blocks.

2.4 The MET Divisional Meeting recommended (Recommendation 3/1) that an appropriate ICAO panel, in close coordination with the WMO, be charged with developing a draft operational concept and roadmap for the integration of aeronautical meteorological information into trajectory-based operations (TBO), and using the roadmap to establish additional air traffic management requirements in order to make aeronautical meteorological service capabilities consistent with TBO, in accordance with the “One Sky” concept described in the Global air navigation plan (Doc 9750). TBO is a door-to-door concept and, thus, the recommendation of the MET Divisional Meeting on the development of the

meteorological service for the terminal area (Recommendation 2/10) is an integral part of the activities for defining the requirements for the aeronautical meteorological service capabilities.

2.5 The operational concept for the integration of aeronautical meteorological information into trajectory-based operations (TBO) addresses improvements related to ASBU Blocks 1, 2 and 3 of the global air navigation system. The activities for establishing the additional air traffic management requirements regarding aeronautical meteorological service capabilities to support TBO shall initially focus on Block 1.

2.6 The MET Panel has been working on this topic and, at its last meeting (METP/4), formulated recommendation 3/1 – New approach for the definition of new MET requirements, tasking the rapporteur of the WG-MRI with preparing, on behalf of the METP, a work document for the upcoming ATMRPP meeting, to ask approval for the proposed new approach consisting in the identification of three areas of information service development (long-haul flight operations, aircraft ground de-icing operations and aerodrome observations). It will be important to follow up on the development of such document and consider it for the provision of aeronautical meteorological services in support of trajectory-based operations within the context of Project H5.

#### Project H5 for the SAM Region

2.7 Regarding the development of Project H5, consisting of the design and conduction of surveys among international air navigation stakeholders to identify the MET services required in a CDM and A-CDM environment, the MP/2 meeting was informed of the completion of this document, which was submitted for review and other actions that might be deemed appropriate.

2.8 Regarding States that have performed tasks related to MET in support of a CDM and A-CDM environment and to ATFM, Argentina, Brazil and Colombia have established procedures. The Meeting could take note of the good practices in these States and replicate them in aeronautical meteorological services.

2.9 The working group could take note of the procedures implemented in other States and include them as a task of the project and follow up on the work of the MET Panel in relation to ATM MET requirements in support of TBO. It could also include among its tasks the follow-up to the GANP in relation to A-CDM modules and modules B0-AMET and B1-AMET. The project is shown in **Appendix B** to this working paper. The Meeting could include the tasks through an *ad hoc* group.

### 3. **Suggested action**

3.1 The Meeting is invited to:

- a) take note of the information provided in this working paper;
- b) review and analyse Appendices A and B;
- c) agree on actions deemed necessary regarding the proposal in paragraph 2.9; and
- d) consider any other action it may deem appropriate.

**APÉNDICE A**  
**MÓDULOS ASBU NO ESPECÍFICOS DE MET EN LOS QUE**  
**EL SERVICIO MET AERONÁUTICO SERÁ IMPORTANTE**

<i>Área de mejoramiento de la eficiencia</i>	<i>Referencia - Módulo</i>	<i>Alcance - Módulo</i>
Operaciones aeroportuarias	B0-ACDM	Operaciones aeroportuarias mejoradas mediante CDM a nivel aeropuerto
	B0-APTA	Optimización de los procedimientos de aproximación, guía vertical incluida
	B0-WAKE	Mayor rendimiento de las pistas mediante separación por estela turbulenta optimizada
	B1-WAKE	Mayor rendimiento de las pistas mediante separación dinámica por estela turbulenta
	B2-WAKE	Separación avanzada por estela turbulenta (basada en el tiempo)
Sistemas y datos interoperables a escala mundial	B1-DATM	Mejora del servicio mediante integración de toda la información ATM digital
	B1-FICE	Mayor interoperabilidad, eficiencia y capacidad antes de la salida mediante la aplicación de información de vuelo y flujo para el entorno cooperativo (FF-ICE/1), paso 1
	B1-SWIM	Mejoramiento de la eficiencia mediante la aplicación de la gestión de la información de todo el sistema (SWIM)
	B2-FICE	Mejor coordinación mediante la integración tierra-tierra entre centros múltiples (FF-ICE/1 y objeto de vuelo, SWIM)
	B2-SWIM	Posibilitar la participación de a bordo en la ATM colaborativa mediante la SWIM
	B3-FICE	Mayor eficiencia operacional mediante la introducción de FF-ICE completa
Optimización de la capacidad y vuelos flexibles mediante una ATM mundial colaborativa	B0-FRTO	Mejores operaciones mediante trayectorias en ruta mejoradas
	B1-FRTO	Mejora de las operaciones mediante la optimización de las rutas ATS
	B1-NOPS	Mayor eficiencia para manejar la afluencia mediante la planificación operacional de la red
	B3-NOPS	Gestión de la complejidad del tránsito

<i>Área de mejoramiento de la eficiencia</i>	<i>Referencia - Módulo</i>	<i>Alcance - Módulo</i>
Trayectorias de vuelo eficientes mediante operaciones basadas en la trayectoria	B0-CDO	Mayor flexibilidad y eficiencia en los perfiles de descenso (CDO)
	B0-CCO	Mayor flexibilidad y eficiencia en los perfiles de salida – operaciones de ascenso continuo (CCO)
	B1-CDO	Mayor flexibilidad y eficiencia en los perfiles de descenso (CDO) utilizando VNAV
	B1-TBO	Mejor sincronización del tránsito y operación basada en la trayectoria inicial
	B2-CDO	Mayor flexibilidad y eficiencia en los perfiles de descenso (CDO) utilizando VNAV, velocidad requerida y hora de llegada requerida
	B3-TBO	Operaciones íntegramente basadas en la trayectoria 4D

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## APPENDIX B

### NAME OF THE DRAFT PROJECT: IMPROVEMENTS TO MET SERVICES IN ACCORDANCE WITH THE NEW OPERATIONAL REQUIREMENTS IN SUPPORT OF ATM

SAM Region	DESCRIPTION OF PROJECT (DP)	DP N° H5	
Programme	Title of the Project	Start date	End date
<p style="text-align: center;">Aeronautical Meteorology</p> <p style="text-align: center;">(Programme coordinator: Jorge Armoa)</p>	<p style="text-align: center;">Improvements to MET services in accordance with the new operational requirements in support of ATM</p> <p><i>Project coordinator:</i> Arturo Lomas (Ecuador)</p> <p><i>Experts contributing to the project:</i> Eduardo Recalde (Ecuador) Ricardo Reyes Távora (Peru)</p>	January 2016	December 2018
<b>Objective</b>	Implement MET services within the framework of the ATM operational concept, CDM, and ASBU blocks related to improvements favouring data and system interoperability (SWIM) by December 2018.		
<b>Scope</b>	Deliver quality and timely MET information to all stakeholders of the SAM Region, in alignment with the Global Air Navigation Plan.		
<b>Metrics</b>	<p>Number of States that responded to the survey.</p> <p>Submission by States of an implementation programme to improve MET services, including human and technological factors.</p>		
<b>Strategy</b>	All the work will be carried out by experts designated by SAM States participating in the project, under the leadership of the Project Coordinator and the supervision of the MET Programme Coordinator through the GoTo Meeting system. Once the tasks have been completed, the results will be delivered to the MET Programme Coordinator as a final document, for its submission to, and, if necessary, approval by, the GREPECAS PPRC through the GREPECAS fast-track procedure. To support collaborative decision-making, meetings will be held with the areas involved.		
<b>Goals</b>	<p>Completion of the proposed survey by 100% of States.</p> <p>Submission of a continuous improvement programme in the provision of MET services by 100% of States.</p>		
<b>Rationale</b>	Through more precise and timely meteorological information, it will be possible to optimise flight path planning and prediction, thus enhancing the safety and efficiency of the ATM system; improved reports and aerodrome forecasts will optimise the use of available aerodrome capacity; and meteorological information will contribute to minimise the environmental impact of air traffic. Performance management will be an important part of meteorological information quality assurance.		

<b>Related projects</b>	<ul style="list-style-type: none"> <li>➤ Automation</li> <li>➤ A-CDM implementation</li> <li>➤ ATFM implementation</li> <li>➤ PBN implementation</li> <li>➤ Improvement of ATM situational awareness</li> </ul>
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Project deliverables	Relationship with PFF of the SAM PBIP <sup>i</sup>	Responsible party	Status of implementation <sup>ii</sup>	Delivery date	Comments
Design and drafting of a survey of international air navigation to identify MET services required for the CDM and A-CDM environment		MET Programme Coordinator and Project Director		June 2017	The group will send the survey to the Secretariat for circulation to the States.
Reception of the survey duly completed by the States				March 2018	
Analysis and assessment of results obtained from the survey and identification of gaps for improving MET services in order to increase efficiency, safety, and regularity.		MET Programme Coordinator and Project Director		June 2018	Communicate the results to the States through the Secretariat, so that each may prepare its MET service improvement programme.
Follow-up to programmes submitted by States on the basis of the gaps identified.		MET Programme Coordinator and Project Director		December 2018	
<b>Required resources</b>	Availability of GoToMeeting to define the content of the survey and analyse its results. The States could use their human resources to plan the implementation of requirements in support of ATM. Availability of resources to hold meetings on the second year in order to review the project.				

<sup>i</sup> Performance-Based Air Navigation Implementation Plan for the SAM Region

<sup>ii</sup>

<i>Grey</i>	<i>Task not started yet</i>
<i>Green</i>	<i>Activity being implemented as scheduled</i>
<i>Yellow</i>	<i>Activity started with some delay, but expected to be implemented on time</i>
<i>Red</i>	<i>Activity not implemented on time; mitigation measures are required</i>