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International Civil Aviation Organization
South American Regional Office
Second Meeting of Air Navigation and Safety Directors of the SAM Region
(Lima, Peru, 14 to 16 September 2015)

Agenda Item 1: Declaration of Bogota: Follow-up to the implementation of air navigation priorities

Follow-up to AIM implementation goals

(Presented by the Secretariat)

SUMMARY

This working paper makes reference to GREPECAS Programmes and Projects within the context of AIS-to-AIM transition, showing the progress made by SAM States, Territories, and international organisations regarding the implementation of the Quality Management System (QMS) as a goal of the Bogota Declaration. It also presents the progress made by users in making electronic terrain and obstacle data sets (e-TOD) available, and AIXM, which are being addressed as part of the second phase of the AIS-to-AIM transition.

References:

- Annex 15 - Aeronautical Information Services
- ICAO AIS-to-AIM Transition Roadmap
- GREPECAS/17 meeting report
- PPRC/3 meeting
- SAM/AIM meetings

ICAO strategic objectives:	*A - Safety* *B - Air navigation capacity and efficiency* *E - Environmental protection*

1. Background

1.1 The objectives of the SAM Region for the AIM Programme are focused on the implementation of the AIS-to-AIM Transition Roadmap. This roadmap contemplates the transition from AIS to AIM in three phases. In order to implement the first phase and prepare for the implementation of the second phase, ICAO has focused on the development of supporting standards that must be implemented as a matter of priority.

1.2 GREPECAS supports this transition through three projects related to the electronic supply of terrain and obstacle data, AIXM, and quality certification of AIM processes, as the basis for ensuring the quality of data and information.

e-TOD Project

1.3 The provision of electronic terrain and obstacle data is a very important objective, since this data is to be used in various air navigation applications.

1.4 These applications include the ground proximity warning system with avoidance of flight into terrain function, and the minimum safe altitude warning (MSAW) system; the establishment of contingency procedures during a missed approach or rejected take-off; the analysis of aircraft operational limitations; the design of instrument procedures; the determination of the en-route cruise descent procedure and location of en-route emergency landing; the advanced surface movement guidance and control system (A-SMGCS); and the production of aeronautical charts and on-board databases.

1.5 Regarding the above, the implementation date of 15 November 2015 established in Annex 15 for Area 2 is critical, due to its impact on other applications that are beneficial for the industry.

AIXM Project

1.6 The Aeronautical Information Exchange Project, despite the fact that software tools are of free and open access, did not get the expected impulse in the Region, since in many States, AIS units were not suitably staffed or lacked knowledge of database management, geographic information systems, and integrated automated systems.

QMS Project

1.7 The objective of this project is to implement quality in AIM processes. Although it is the first on which work was started, it has not given the expected results, taking into account the guidance and training provided to State experts for the implementation of quality in their AIS processes.

1.8 The QMS Project is part of the commitment to the Bogota Declaration and serves as the basis for the other implementation programmes. Therefore, delays in quality implementation and certification by States have a multiplying effect, since the future development of the digital phase is dependent on this implementation.

2. **Discussion**

QMS Project

2.1 The Project for the implementation of the Quality Management System in AIM processes has made progress in terms of the activities that need to be carried out prior to certification. In this regard, **Uruguay** has certified quality with ISO 9001:2008 standard on 31 August 2015. **Peru** estimates to obtain its certification in October 2015. **Panama** expects to complete the processes and obtain its certification in December 2015. **Argentina** expects to certify in February 2016.

2.2 **Colombia** and **Venezuela** still cannot certify their AIM systems, but the most disturbing delays in quality implementation are those of **Bolivia, Guyana,** and **Suriname**.

2.3 In this regard, **Bolivia** reported at the SAM/AIM/8 meeting that the Civil Aviation Authority of Bolivia had requested the top management of the service provider, AASANA, to give more priority to, and take urgent steps to expedite, the implementation of quality systems in AIM units and their subsequent certification.

2.4 In order to advance with the AIS-to-AIM Transition Plan, it is necessary to request those States that have not certified their QMS in AIM services and that are below 80% implementation, to submit an Action Plan. In this Action Plan, the experts responsible for implementation in AIM units must provide a detailed description of tasks.

2.5 The main articulating factor for advancing in the certification of quality management systems in the States is top management. Top management, when committed to obtaining the quality certification of systems and processes, helps remove managerial barriers that hinder implementation.

2.6 The Bogota Declaration entails a regional commitment by top management to quality certification of AIM processes. This commitment must be replicated at national level in order to achieve certification as scheduled.

2.7 The latest update on progress in quality implementation is shown in the following table:

STATE	% OF IMPLEMENTATION MARCH 2015	IMPLEMENTATION DATE	% PROGRESS	REMARKS
Argentina	80%	FEB/2016	10%	
Bolivia	30%	TBD	0%	The provider AASANA has trained two experts for quality implementation.
Brazil	**CERTIFIED**	----------	----------	
Chile	**CERTIFIED**	----------	----------	
Colombia	90%	SEP/2014	0%	Shows no progress.
Ecuador	**CERTIFIED**	----------	----------	
French Guiana	**CERTIFIED**	----------	----------	
Guyana	25%	DEC/2015	25%	Shows no progress.
Panama	70%	DEC/2015	20%	Foresees certification in December 2015.
Paraguay	**CERTIFIED**	----------	----------	
Peru	100%	OCT/2015	20%	Internal audit conducted.
Suriname	45%	AUG/2014	0%	Shows no progress.
Uruguay	**CERTIFIED**	AUG/2015	----------	
Venezuela	70%	NOV/2014	0%	Shows no progress.

Supplementary AIM activities related to the second transition phase

Status of implementation of e-TOD

2.8 At the same time, some progress has been made in e-TOD implementation in accordance with the standards contained in Annex 15. This is part of the electronic provision of data in the digital phase of AIM, and is of extreme importance for the systems described in paragraph 1.4 above.

Note: *The coverage areas and requirements for the provision of e-TOD, as well as the terrain and obstacle data set for these areas are specified in Chapter 10 and its respective appendices, in Annex 15, 14th edition.*

2.9 The status of implementation in the Region of electronic terrain and obstacle data related to the different areas described in Annex 15 is as follows:

AREA 1 - Terrain

2.10 Information was collected on compliance with Area 1 terrain surveying requirements, with the following results:

a) Regarding digital terrain and/or elevation models, the SAM/AIM/7 meeting was presented with a model guide for developing a digital terrain model (MDT) or a digital elevation model (MDE) for AIS. Regarding this implementation, **Argentina, Brazil, Chile, Colombia, French Guiana, Panama, Peru**, and **Venezuela** have a digital terrain and/or elevation or surface model for the development of Area 1. The current percentage of implementation is 56% of States in the Region with digital models. **44% remains to be completed before November 2016. 50% progress achieved since December 2013.**

b) Regarding compliance with Table 8-1 of Annex 15 on terrain requirements for Area 1, the States that meet the requirements are **Argentina, Chile, French Guiana, Panama, Peru**, and **Venezuela.** The current percentage of implementation is 42%. **58% remains to be completed before November 2016. 51% progress achieved since December 2013.**

c) Regarding compliance with ISO standard 19110 for the digital model, **Argentina, Brazil, Chile, Colombia, French Guiana, Panama, Peru**, and **Venezuela** report compliance, reaching 56% of SAM States. **44% remains to be completed before November 2016. 14% progress achieved since December 2013.**

AREA 1 - Obstacles

2.11 Information was collected on compliance with Area 1 obstacle surveying requirements, with the following results:

a) Regarding the availability of an obstacle database covering Area 1, **Argentina, Brazil, Colombia, Peru, French Guiana**, and **Uruguay** meet the requirement, reaching a percentage of compliance in the Region of 42%. **Chile** only complies partially and thus is not considered as completed. **58% remains to be completed by November 2016. 51% progress achieved since December 2013.**

b) **Argentina, Brazil, Chile, Panama, Peru, Uruguay**, and **Venezuela** meet the obstacle requirements established in Table 8-1 for Area 1. The level of compliance in the Region

reaches 42%. **58% remains to be completed by November 2016. 51% progress achieved since December 2013.**

AREA 2 - Terrain

2.12 Regarding action plans to obtain electronic terrain data in Area 2a, **Argentina, Bolivia, Brazil, Chile, Panama, Paraguay, Peru**, and **Uruguay** account for **56% of compliance. 44% remains to be completed in 2015. 56% progress achieved since December 2013.**

2.13 Upon analysing compliance with the supply of terrain data corresponding to the take-off path, the States that reported having developed an action plan were **Argentina, Brazil, Chile, Panama, Paraguay, Peru**, and **Uruguay**. The Region has achieved 49% compliance. **51% remains to be completed in 2015. 35% progress achieved since December 2013.**

2.14 Regarding the provision of electronic terrain data corresponding to the area delimited by the lateral extension of the obstacle limiting surfaces of the aerodrome, **Argentina, Brazil**, **Chile**, **Panama**, **Paraguay**, and **Peru** account for **35% of implementation. 65% remains to be completed in 2015. 35% progress achieved achieved since December 2013.**

AREA 2 - Obstacles

2.15 **Argentina, Bolivia, Brazil, Chile, Panama, Paraguay**, and **Peru** have developed action plans for the collection of data for Area 2a regarding obstacles that penetrate the obstacle limiting surface, in accordance with Appendix 8 to Annex 15, reaching 49% compliance. **51% remains to be completed in 2015. 42% progress achieved since December 2013.**

2.16 Likewise, **Argentina, Bolivia, Brazil, Chile, Panama, Paraguay**, and **Peru** reported progress in their action plans for the provision of electronic data on objects protruding from the flat slope of 1.2% with respect to the take-off path. **58% remains to be completed in 2015. 51% progress achieved since December 2013.**

2.17 Regarding the provision of electronic data on penetration of obstacle limiting surfaces at aerodromes, **Argentina, Bolivia, Brazil, Chile, Panama, Paraguay**, and **Peru** have developed action plans to meet this requirement. The percentage of compliance is 49%. **51% remains to be completed in 2016. 42% progress achieved since December 2013.**

2.18 Likewise, **Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Panama, Paraguay, Peru, Suriname**, and **Uruguay** have adopted the Manual on technical specifications for the implementation of e-TOD. **84% progress achieved since December 2013.**

e-TOD training in the SAM Region

2.19 Regarding e-TOD training in the Region, **Argentina, Brazil, Chile, Colombia, Ecuador, French Guiana, Panama**, and **Uruguay** have e-TOD training programmes, **accounting for 56% of States**. **44% remains to be completed in 2015. 51% progress achieved since December 2013.**

2.20 As to the inclusion of operational concepts in training, **the Region has achieved a level of implementation of 72%. 28% remains to be completed in 2015. 72% progress achieved since December 2013.**

2.21 Regarding the equipment and programmes required for managing e-TOD information, the Region has achieved a level of compliance of 56% on this requirement. **44% remains to be completed in 2015. 51% progress achieved since December 2013.**

Service level agreements (SLAs) and geographic information systems (GIS)

2.22 Regarding the signing of service level agreements (SLAs) between AIM units and data providers, Brazil has issued regulations requiring data providers to meet numerical and quality data requirements. Providers in Chile are both from within and from outside the quality system of the Administration. It is deemed important that an AIC be published containing the numerical requirements in order to keep pace with the relevant changes made to the amendments to Annex 15. **SLA implementation is 35%. 35% progress achieved since December 2013.**

2.23 Another achievement related to this Project is the implementation of **Geographic Information Systems (GIS), with a percentage of implementation of 63%** by the States of the Region. **51% progress achieved since December 2013.**

2.24 The following table illustrates the status of implementation of GIS and SLAs:

2015 State	States with automated systems or GIS = 63%	States that establish SLAs = 35%
ARG	**YES**	**YES**
BOL	NO	NO
BRA	**YES**	**YES** (standard)
CHI	**YES**	**YES** within the Integrated Quality System
COL	**YES**	NO
ECU	NO	NO
FGY	**YES**	NO
GUY	NO	NO
PAN	**YES**	NO
PAR	**YES**	NO
PER	**YES**	**YES**
SUR	NO	NO
URU	**YES**	**YES**
VEN	NO	NO

Status of implementation of AIXM

2.25 For this implementation, Peru helped with the coordination and Uruguay provided XML expert knowledge. These experts are currently performing the tasks needed to guide the implementation. Likewise, documents produced by EUROCONTROL and needed as guidance for States have been translated into Spanish.

2.26 These documents include the *temporality model*, where time is considered a critical aspect of the aeronautical information framework and where changes are normally reported much in advance to their effective date.

2.27 Another document describes how the AIXM Conceptual Model is converted into an AIXM XML schema. The conversion process is illustrated in a series of examples of the AIXM 5 XML schema.

2.28 The third document, entitled *AIXM Application Schema Generation,* is aimed at describing how the AIXM UML model can be extended; for example, defining the messages required, and if necessary, how to restrict the content of these messages to a sub-set of AIXM components. It also describes how to extend the existing AIXM components with new attributes or associations, or how to define new components that are only relevant for the community.

2.29 The fourth document, *AIXM Feature Identification and Reference*, defines a number of standard cases on how XLinks should be used within an AIXM 5.1 message and how these XLinks should be resolved by the applications. It also provides guidance on the algorithms that can be used for the generation of UUID values.

2.30 Once completed, these documents should be reviewed by the experts in the respective Administrations so as to become aware of the tasks that need to be performed for AIXM implementation. The Secretariat will circulate these documents once the team of experts designated by the Project completes the initial analysis thereof.

3. **Suggested action:**

3.1 The Meeting is invited to:

a) encourage States to double their efforts to accelerate quality certification of AIM processes, in order to complete the first phase of the AIS-to-AIM Transition Roadmap while complying with the Bogota Declaration;

b) take note of the information on the status of implementation of GREPECAS Projects related to the second phase of the AIS-to-AIM transition; and

c) ask States that have not shown any progress and that are listed in the table in paragraph 2.7, to inform about the status of implementation of quality to the Secretariat during this meeting.

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