Agenda Item 6: Monitoring of the Coordination Project for the issuance of homogeneous and continuous SIGMETs

(Presented by the Secretariat)

SUMMARY
This information paper presents the "SIGMET Coordination Project between MWOs serving adjacent FIRs" and its current status under consideration by the GREPECAS Programme and Project Review Committee.

References:
- Report of the First MET Coordination Meeting
- Report of the Fourth Virtual Meeting of the GREPECAS Programme and Project Review Committee (GREPECAS PPRC)

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

1. Introduction

1.1 The first MET Coordination Meeting recommended the preparation of a project on SIGMET coordination between MWOs serving adjacent FIRs.

1.2 The development of the project was entrusted to the State of Peru for its submission to the PPRC Meeting, through the Secretariat.

2. Discussion

2.1 The Coordinator of the SIGMET Coordination Project between MWOs serving adjacent FIRs submitted the Project Charter to the Secretariat for consideration and evaluation. The project is led by Chile, with the participation of Argentina, Panama and Paraguay.

2.2 The project, after being reviewed by the Secretariat, was sent again to the experts supporting the project for its final review, prior to its submission to the GREPECAS Programme and Project Review Committee.

2.3 The Fourth Virtual PPRC Meeting (ePPRC/4) reviewed the draft submitted by the SAM Region. After reviewing the project contents, the meeting noted that the projects formulated by the SAM Region would have implications for the implementation of the CAR Region and proposed the following draft conclusion:

DRAFT CONCLUSION	
ePPRC/4-3	**REVIEW OF MET PROJECTS TO CONSIDER EXTENDING**

<table>
<tr><td colspan="3">THEIR SCOPE TO THE CAR REGION</td></tr>
<tr><td colspan="2">That:
CAR States, in coordination with the NACC Regional Office, review the scope of the projects formulated by the SAM Region in order to consider possible improvements, the extension of their scope to the CAR Region and possible contributing experts:
- SIGMET Coordination Project between MWOs serving adjacent FIRs;
- Regional implementation of the ICAO meteorological information exchange model (IWXXM)
and upon completion of the analysis by May 2022 at the latest, the projects be submitted to GREPECAS for approval through the fast-track procedure.</td><td>Expected impact:
☐ Political / Global
☒ Interregional
☐ Economic
☐ Environmental
☒ Technical/Operational</td></tr>
<tr><td colspan="3">Why:
a) It is felt necessary to analyse the feasibility of extending the scope of both projects.
b) The issuance of continuous and homogeneous SIGMET messages when an occurrence affects more than one FIR means that reliable and quality-assured information is provided in support of safety.
c) The implementation of OPMET message exchange in IWXXM format is an enabler for SWIM.</td></tr>
<tr><td>When:</td><td>a) Complete analysis by May 2022 at the latest;
b) Both projects are to be completed by December 2025 at the latest.</td><td>Status: ☒ Valid / ☐ Invalid / ☐ Finalised</td></tr>
<tr><td>Who:</td><td>☒ States ☒ ICAO ☒ Others:</td><td>Users/Industry</td></tr>
</table>

3. Conclusion

3.1 The project on SIGMET coordination between MWOs covering adjacent FIRs was welcomed by the ePPRC/4. However, its approval is awaiting the analysis of its applicability to the CAR Region and hence of the need to extend its scope.

3.2 The CAR Region should complete its review by this May, and then it would be submitted to GREPECAS for approval through the fast-track procedure.

3.3

APPENDIX A

SIGMET COORDINATION PROJECT BETWEEN MWOS COVERING ADJACENT FIRs

Name of the project:	"SIGMET Coordination Project between MWOs covering adjacent FIRs"		
Date:	xx/xx/2022	**Emision:** xx/xx/xxxx	Version 1
Author:	SAM Regional Office		
Promoter:	GREPECAS		
Representative:	Armoa, Jorge		
Client:	States of the CAR/SAM Region		
ID Document:	xxx		
Link:	xxx		

Note: This document is valid only on the date it is printed.

Content

1. Executive Summary 2
2. Background 2
3. Problem Statement 3
4. Project objective 3
5. Guidance document 3
6. Options when faced with problems 3
7. Outlook of implementation 3
8. Actions for implementation 5
9. Expected benefits 7
10. Budget / costs 7
11. Possible risks 7
12. Possible disadvantage 8
13. Project deliverables 8
14. Deadlines 8
15. Attachment A - List of Acronyms 9

1. Executive Summary

This project, called "SIGMET Coordination Project between MWOs covering Adjacent FIRs", seeks to correct the deficiencies detected by the 2014 ICAO Divisional MET, which establishes the need to have harmonized and coordinated SIGMET information between different States in order to provide accurate information on aviation hazardous weather phenomena that may affect more than one FIR in adjacent States.

2. Background

The main reason that guides this project is to provide a solution to remedy the deficiencies identified by users in relation to SIGMET information. As one of the first antecedents, in 2014 during the Meeting of the then called MET Division of the International Civil Aviation Organization (ICAO), this problem was discussed regarding SIGMET information. Therefore, in the final report of the Meeting we find the agreed recommendation, in order to mitigate the deficiencies through the development of a system of Regional Advisory Centers on Hazardous Meteorological Phenomena for aviation. After the restructuring of ICAO, in 2015, the designated Meteorology Panel (METP) began to work on the development of this system, as well as other changes in Annex 3, to introduce improvements that manage to provide a solution to the deficiencies regarding SIGMET information, clearly taking into account that meteorological weather does not follow national nor sub-national borders. In this sense, the various MET groups of the different ICAO Regions began to work on initiatives to provide efficient solutions to this problem. Thus, various multinational projects and/or SIGMET coordination alliances arose in the world, such as, for example, in Europe the "MET Alliance SIGMET Coordination Project" made up of: Germany, Austria, Belgium, France, Ireland, Luxembourg, the Netherlands and Switzerland. Also, NAMCon between Denmark and Sweden, PT-EAST Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Ukraine and Uzbekistan have advanced their coordination efforts. At the same time, several coordination projects have been developed in Asia, including that of the LMOs of Indonesia, Malaysia and Singapore. It is important to note that the Hong Kong Observatory developed a web tool to support SIGMET coordination in Southeast Asia. Finally, since 2016, the SIGMET Coordination has been implemented on a pilot basis among Japan, the Philippines and Vietnam, who also have a common platform for operational interaction for the preparation of SIGMET messages.

Among the initiatives implemented, one that has proven to be very efficient is based on commonly used procedures, monitoring and follow-up of coordination results, including annual training on best practices based on lessons learned, the most notable being the coordination established between Germany, Austria and Switzerland (DACH).

Meanwhile, a series of changes were introduced through ICAO Annex 3 “Meteorological Service for International Air Navigation” through different amendments.

In amendment 78 (2018), of the aforementioned Annex, a Note was added in paragraph 3.4.1 of Chapter 3 of Annex 3, referring to guidelines addressed to the Meteorological Watch Offices: "on cooperation and coordination, bilateral and multilateral for the provision of SIGMET information messages (Doc.8896), to meet the needs of users and harmonize the provision of information on dangerous meteorological conditions en route”.

Added to the previous initiative was the inclusion through amendment 79 to Annex 3 of a Recommended Practice (3.4.4) that encourages the MWOs of the States to coordinate SIGMET: “[…] 3.4.4 Recommendation.—An MWO should coordinate SIGMET information with neighboring MWOs, especially when en-route weather phenomena extend, not expected to be beyond the MWO's specified area of responsibility, in order to ensure the harmonized provision of SIGMET information. . […]

3. Problem Statement

The preparation of SIGMETs messages by a Meteorological Watch Office (MWO) is only limited to the area under its responsibility (Flight Information Region – FIR). Due to the nature of the phenomena, which sometimes affect more than one FIR at the same time, it is common to observe that the description of the meteorological phenomena, as well as the region that they affect, does not present homogeneity or continuity.

4. Objetive of the Project

Based on:

- The recommendation of Annex 3 and other ICAO documents;
- Work carried out by the MET Panel;
- Examples of good practices, at a global level, of the coordination for the issuance of continuous SIGMETs;

It is intended to establish a platform and agreements that allow the issuance of continuous and homogeneous SIGMETs to be coordinated.

5. Guidance Documents

The guidance material available to orient the implementation includes the following documents:

- Annex 3 - Meteorological Service for International Air Navigation
- Doc. 8896 – Manual of Aeronautical Meteorological Methods
- uide for the Preparation and Dissemination of SIGMET Messages for the CAR/SAM Regions

6. Options when facing problems

a) Not planning corrective actions

Based on the needs raised by the users of the aeronautical industry, air operators, and airlines, this is an initiative that seeks to efficiently satisfy the expressed requirements and that seeks to comply with the practice recommended by ICAO, that not developing this project implies not reducing the risk to operational safety due to the lack of harmonization of this information, as well as:

- Maintain the current deficit of SIGMET information in the Region.
- Lack of harmonic procedures for issuing SIGMET information.
- Maintain a territorial and non-regional view of meso-scale meteorological phenomena.
- Maintain a deficient Regional monitoring of adverse meteorological phenomena.

b) Planning corrective actions

The development and implementation of this project has a direct impact on improving the service provided, increasing the levels of operational safety, delivering more precise information and without "cuts", making the air routes safer and more efficient. In addition, it allows meeting the needs of users and ICAO requirements in a context in which it is mandatory to apply a quality management system, in accordance with the needs and requirements of users, as mentioned in Annex 3.

7. Implementation perspective

In order to implement the Project it is necessary:

- Bilateral agreements agreeing on meteorological phenomena on which SIGMET will be coordinated (supported by climatology), monitoring and follow-up actions, lessons learned, regularity of training based on the results of the coordination;

- Common coordination action procedures;

- Web platform for common use, where it is possible to interact simultaneously to agree on elements and spatial distribution of SIGMET reports (chat, necessary tools, such as products produced by the WAFCs, remote sensing products, numerical models, etc.);

- Common training for all personnel related to the different adjacent MWOs, harmonized, common, and permanent.

The implementation of the Coordination between the MWOs of the adjacent FIRs implies changes in the functionality of the surveillance information processing of a flight information region, since it implies extending the borders of this surveillance and interacting with other MWOs, some of which could be located in other regions (CAR/SAM or AFI/SAM). For this reason, it will be imperative to train the staff that works in the MWOs to carry out this integration as well as the sharing of data and information, even in different languages. *Table 1* presents the overview of the processes evolution, included in the period 2022-2025.

Process	Current Scenario 2022	New Scenario 2025
Production of Bilateral Agreements	• There are no bilateral agreements. • There are first contacts between some MWOs, but no formal agreements. • The task is still at Recommendation level in Annex 3. • There are examples of good practices as well as work by the MET Panel aimed at forming Regional Advisory Centers on SIGMETs.	• Bilateral agreements that allow the exchange of information and meteorological surveillance data between the MWOs of adjacent FIRs, as well as the preparation and dissemination of continuous and homogeneous SIGMETs. • Preparation and dissemination of homogeneous and continuous SIGMETs.
Procedures for Coordination of common actions and web platform for common use	• There are no coordination procedures between the MWOs of adjacent FIRs in cases where a meteorological phenomenon affects more than one FIR at the same time. • There are no platforms that allow the sharing of data and information on meteorological surveillance of the FIRs. • Homogeneous and continuous coordinated SIGMETs are not issued between the MWOs of adjacent FIRs when the meteorological phenomenon affects two or more FIRs.	• Existence of well-defined procedures between MWOs of adjacent FIRs in case a meteorological phenomenon affects more than one FIR at the same time. • Existence of a platform that allows data and information on meteorological surveillance to be shared between the MWOs of adjacent FIRs. • Existence of a platform that allows data and information on meteorological surveillance to be shared between the MWOs of adjacent FIRs. [1] • Homogeneous and continuous coordinated SIGMETs will be issued between MWOs of adjacent FIRs when meteorological phenomena affect two or more FIRs. 1

[1] Meteorological phenomena, in the case of storms or mesoscale convective complexes, that affect more than one FIR, will not always have, the CBs, the same top in said FIRs. In this case, homogeneous SIGMETs will not always be issued.

Common training for all personnel connected to the different adjacent MWOs	• The States, and the MWOs in particular, have planned training for meteorological surveillance of the FIR but have not included in their plans training for coordinated work between MWOs of adjacent FIRs.	• It is expected that once the platform and the bilateral agreements have been implemented, the training for the use of the platforms be included in the Training Programs, as well as in the implementation of the bilateral agreements.

8. Actions for implementation

Actions based on the participation of States, international organizations and interested parties are proposed. The collaborative approach is the critical factor of this initiative. The following actions are proposed:

8.1 Establishment of support groups and bilateral agreements

The MET Coordination Group has established a working group, made up of representatives of States and MET service providers to support the preparation and execution of this project. The Project is led by an expert from the State of Chile and has the support of experts from:

- Argentina;
- Panama
- Paraguay

In order to ensure that the implementation process meets the projected deadline, a collaborative approach is proposed that generates synergy based on the effort and participation of each State, through consultations and preliminary meetings between those responsible for the Project, the States that must establish bilateral agreements, based on climatology, and the Secretariat.

It is proposed to form groups of 2, 3 or 4 countries, according to the Climatology of meteorological phenomena, with whom the models of bilateral coordination agreements will first be presented. These first tasks will be carried out through zoom platforms or TEAMs.

	Actions	**Completion period**
1.	Climatology of Meteorological Phenomena	2 months after approval
2.	Meeting and establishment of adjacent MWOs that should have bilateral Agreements	2 months after completion 1)
3.	Establishment of bilateral or multilateral Agreements between adjacent MVOs	Up to 6 months after completion 2)
4.	Coordination tests	During the following 12 months after 2) subject to the occurrence of meteorological phenomena
5.	Industry consultations with industry	1 week after each coordination test

8.2 Establishment of the Platform for the sharing of data and information on meteorological surveillance for decision-making

The Group of experts that will develop the Project, after establishing the Bilateral Agreements, will focus on the preparation of the web platform to share the information on the FIRs' meteorological surveillance. The involvement of the industry and other areas of air navigation, at this stage, will be essential to establish the best interface to increase the situational awareness of MET experts working on MWOs and to make the best decisions at the time of deciding to issue or not continuous and homogeneous SIGMETs.

This initiative suggests establishing an interdisciplinary team (MET, ATM, Industry, IT) that allows the development of this interface based on best practices implemented globally. The tasks are described below:

Actions	Completion period
1. Platform type design	3 weeks from approval
2. IT consultations on feasibility	3 weeks from completion 1)
3. Platform preparation by IT experts	3 weeks from completion 2)
4. Tests for use of the platform with MET personnel	1 month from completion 3) and for 3 months, subject to the occurrence of meteorological phenomena
5. Feedback from industry and information users	To be determined

8.3 Regional documents / guidance material to support implementation

It is required to prepare a material for the use of the Platform according to the needs of the CAR/SAM States. Therefore, the development, publication and updating of documents related to the following matters should be promoted:

- Platform User Manual.

  This initiative suggests establishing a team of experts to attend to the development of guide material oriented to the Region, in Spanish and English.

Actions	Completion period
1. Establish guide material development team	2 weeks from completion 1)
2. Presentation of work plan	3 weeks from completion 2)
3. Progress report until the end of the plan	1 month from the end 3)
4. Publication and dissemination	To be determined

8.4 Organization of interregional cooperation seminar

The implementation process of the Information Sharing Platform for the FIRs' meteorological surveillance, as well as the bilateral cooperation agreements between the adjacent MWOs is of general interest to the ICAO Member States, because it materializes the first steps to the emission of continuous and homogeneous SIGMETs when a meteorological phenomenon affects two or more FIRs. It is proposed to request the cooperation of international organizations for the transmission of knowledge and experience as good practices are observed, in these fields, collected in the MET Panel.

Actions	Completion date
1. Request for cooperation to designated body	1 week from approval
2. Organization and invitation to a virtual or face-to-face seminar	2 weeks from the response of 1)
3. Development of virtual or face-to-face seminar	2 weeks from completion 2)
4. Presentation of conclusions and recommendations	2 weeks from completion 3**)**

8.5 Application of tests of use of the Platform and the Bilateral Agreement

The tests of use of the Platform and of the Bilateral Cooperation Agreement between the MWOs of adjacent, regional and intra-regional FIRs, require a methodology that defines the test platform and the logical support to be used by the regional system. Each State must train its experts, who work in the MWOs, and their IT support teams, who will be responsible for the development of the tests in order to prepare, in a coordinated manner among the MWOs of the adjacent FIRs, the continuous and homogeneous SIGMETs.

9. Expected Benefits

The expected benefits of the implementation are:

- Bilateral coordination agreements for the issuance of SIGMET
- Clear and precise definition of dangerous phenomena that impact air operations at different latitudes in the Region.
- Common and harmonized procedures, to be used by the region
- Continuous monitoring of dangerous meteorological phenomena for air navigation
- Improvements in the issuance and availability of SIGMET for the Region
- Highly qualified and trained personnel throughout the Region.

10. Budget / Costs

Costs related to the following needs are foreseen:

- Establishment of the platform to share data and information on meteorological surveillance and decision making for the issuance of continuous and homogeneous SIGMETs.
- Education and training of human resources.

11. Main risks

- Short-term costs; States must take into account in their budget the initial costs involved in the implementation of the platform and the personnel training.
- Context of uncertainty: The COVID 19 pandemic maintains a state of uncertainty that affects project planning.
- Delays in signing bilateral agreements: Each State has an established procedure for signing these agreements. These internal procedures could delay the signing of these bilateral agreements.
- Failure to comply with agreed deadlines. The signing of bilateral agreements and the implementation of platforms to share information and data on meteorological monitoring would lead to a delay in the Region that does not allow sufficient flexibility in terms.

12. Possible disadvantage

No disadvantages that may be associated with the implementation of this project are detected at the moment.

13. Project deliverable

The following records are expected:

- Project design;
- Planning of activities to develop

- Gantt diagram or chart
- Model of bilateral agreements
- Coordination action procedures and associated spread sheets, format and monitoring responsibilities, and follow-up for the results report by country, as well as training for associated best practices (regularity, how, who)
- Technical bases for the development of a common web platform.

14. Deadlines

The estimated time for the development of the project is 3 years.

Attachment A - List of Acronyms

AFI/SAM	African/South America Regions
ATM	Air Traffic Management
CAR/SAM	Caribbean/South American Regions
DACH	Region comprising the countries Deutschland (Germany), Austria, and CH for Confoederatio Helvetica [in German (Die) Schweiz]
MET Division	Meteorology Division
FIR	Flight Information Region
GREPECAS	CAR/SAM Regional Planning and Implementation Group
IT	Information technology
METP	Weather Panel
NAMCon	Northern Europe Aviation Meteorology Consortium
ICAO	International Civil Aviation Organization
MWO - OVM	Meteorological Watch Office - Oficina de Vigilancia Meteorológica
PT-EAST	Project Team on Implementation of Meteorological Services in the Eastern part of the EUR
WMO	World Meteorological Organization – Organización Meteorológica Mundial

— — — — — — — — — — —