International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Fifteenth Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/15)
Río de Janeiro, Brasil, 13 – 17 October 2008

Agenda Item 3: Regional air navigation planning and implementation issues

3.3 Report of the AERMETSG/9 Meeting

(Presented by the Secretariat)

SUMMARY

This working paper summarizes the results of the discussions carried out during the Ninth Meeting of the GREPECAS Aeronautical Meteorology Subgroup (AERMETSG/9).

References

- Report of the AERMETSG/9 Meeting, (Lima, Peru, 23 to 27 June 2008);
- Air Navigation Plan for the Caribbean and South American Regions, Doc 8733;
- Report of GREPECAS/14 Meeting (San Jose, Costa Rica, 16 to 20 April 2007);
- Report of RAN CAR/SAM/3 Meeting (Buenos Aires, Argentina, 1999); and
- GREPECAS Procedural Handbook.

1. Background

1.1 The Ninth Meeting of the GREPECAS Aeronautical Meteorology Subgroup (AERMETSG/9) was held in Lima, Peru, from 23 to 27 June 2008. The Meeting was attended by three States from the CAR Region, 10 States from the SAM Region and France representing French Antilles and French Guiana, as well as IATA and United Kingdom, totaling 27 participants. The meeting regretted the absence of the experts of the Subgroup provided by the States of Costa Rica and Spain, and of COCESNA.

1.2 The Subgroup formulated sixteen (16) Draft Conclusions and one (2) Draft Decisions included as **Appendix A** to this working paper. Five (5) Decisions were formulated, which require internal actions by the Subgroup.

2. Discussion

2.1 Review of actions taken on MET Meetings Reports

2.1.1 The Meeting examined the actions taken by the Air Navigation Commission (ANC), by CAR/SAM States/International Organizations and/or by the ICAO Secretariat, regarding Draft Conclusions/Decisions formulated by the Eighth Meeting of the Aeronautical Meteorology Subgroup (AERMETSG/8) held in Santiago de Chile, from 9 to 13 October 2006, and the respective Conclusions/Decisions adopted by GREPECAS/14 (San Jose, Costa Rica, 16-20 April 2007). Also reviewed the actions taken with regard to Conclusions/Decisions, pending implementation, adopted by GREPECAS in the MET field in past Meetings. **Appendix B** to this working paper presents the results of the review.

2.1.2 With regard to GREPECAS Conclusion 12/54, the meeting took note that Peru has great limitations to participate at WAFS Operations Group meetings (WAFSOPSG), consequently, agreed that Chile will replace Peru (**Draft conclusion 9/1**).

2.1.3 Regarding GREPECAS Decision 7/1 – Study to determine the need for VOLMET services in the CAR/SAM Regions, following Conclusion 5/18 of the RAN/CAR/SAM/3 (Buenos Aires, Argentina, 1999), after review of the conclusions emanated from the study and aware that this requirement will involve costs to the airlines, the Subgroup nevertheless agreed to include this requirement (**Draft conclusion 9/2**).

2.2 Implementation of the World Area Forecast System (WAFS)

2.2.1 The subgroup noted with pleasure that WAFC London and Washington are producing ICE/TURB/CB global forecasts in gridded format more than a year ago, which are being operationally proved and are available at the SADIS FTP and at the website: http://aviationweather.gov/testbed/globalgrids.

2.2.2 At the same time, the meeting took note that spatial resolution for all WAFS forecasts will increase from the current WAFS thinned grid scale to a resolution of 1.25 degree unthinned grid; WAFCs will also add three additional upper wind and temperature forecasts at flight levels (FL), FL 270 (350 hPa), FL 320 (275 hPa) and FL 360 (225 hPa); and the temporal resolution of WAFS forecast will increase from 6 to 3 hours. See **Appendix C** for samples of the new products.

2.2.3 In order to foster the correct use of the new icing, turbulence and convective clouds forecasts in GRIB code form, the meeting agreed it was necessary to convene regional training seminars and develop appropriate guidance material to be available for WAFS users through the WAFSOPSG website (**Draft conclusion 9/3)**.

2.2.4 The meeting was pleased to note that according with the information provided in the WAFSOPSG/4, WMO would be ready to establish a trust fund in order to provide funding to assist the States under development in the migration to GRIB 2 code.

2.2.5 The subgroup took note that WAFS provider State plans to expand and improve the telecommunications service for its area of responsibility, and that the existing contract expires 31 December 2009, for which is in the process of transitioning to ISCS-Generation 3 (G3) with a new service contract. There are no plans to provide a dual broadcast service of G2 and G3 once the NWS implements G3. This will be a turn key action and all users of WAFS workstations under the ISCS footprint will be required by 31 December 2009 to receive information using G3.

2.2.6 In addition, it is planning to award a contract for ISCS-G3 by early 2009. The ISCS-G3 will provide improved performance compared to that of the current system. After award of the contract for the ISCS-G3, a detailed transition schedule will be posted on the ISCS web page (http//:www.weather.gov/iscs). Advisory bulletins will also be posted on this web page to keep ISCS users advised on the progress of the transition.

2.2.7 The subgroup took note that in accordance with the NWS protocol, an implementation notice is issued at least 120 days in advance of making changes to products or data that are provided via the National Weather Service Telecommunication Gateway (NWSTG) **(Draft conclusion 9/4)**.

2.2.8 The meeting also noted that ISCS users can also find information on how to report problems related to the reception of WAFS products at: http://www.weather.gov/iscs/trouble.htm. This site also contains an installation and troubleshooting guide for the VSAT receiver, satellite modem and antenna. In addition, ISCS users without access to the Internet may report problems by calling the ISCS Help Desk at 1-303-713-0902 or by sending a FAX to 1-301-587-1773.

2.2.9 The meeting was aware that with the exception of U.S. bulletins, the majority of ISCS and SADIS OPMET information is to be harmonized the 31st August 2008 **(Draft conclusion 9/5)**.

2.2.10 In the WAFC Washington, workstations will be required to be updated to accommodate the changes for the new OPMET data **(Draft conclusion 9/6)**.

2.2.11 Based on the implementation plan for the transition from GRIB 1 code form to GRIB 2 code form adopted (Decision 4/18) by the WAFSOPSG, the meeting convened that in order to ensure the reception of the new WAFS forecasts for icing, turbulence and convective clouds and the migration from GRIB 1 code form to GRIB 2 code form without difficulties, CAR/SAM States should take the required actions for the training and upgrading of WAFS workstations **(Draft conclusion 9/7)**.

2.2.12 The meeting also noted that during the 12 months from August 2006 through July 2007 the ISCS was available over 99.99% of the time, and that the 99.9% availability requirement was exceeded in every month except May 2007. Furthermore, during the 12 months from August 2006 through July 2007 the ISCS fully met the ICAO Annex 3 requirement for timely broadcast of GRIB-1 products within 6 hours of the initial synoptic time, and BUFR SIGWX products no later than 12 hours before its validity time.

2.2.13 The meeting noted that following GREPECAS Conclusion 13/17, 9 of the 14 States of the SAM Region and 4 of the 26 States/Territories of the CAR Region responded the ISCS survey. The ISCS Provider State reviewed and analyzed the completed questionnaires. The results are presented in **Appendix D** to this working paper.

2.3 Implementation of the International Airways Volcano Watch (IAVW)

2.3.1 The AERMETSG reviewed the updates to Doc 9766-AN/968, *Handbook on the International Airways Volcano Watch (IAVW) - Operational Procedures and Contact List*, and took note that the referred manual includes the operational procedures and necessary guidelines for the dissemination of information on volcanic eruptions and associated volcanic ash clouds which could affect routes used by international flights, and necessary pre-eruption measures **(Draft conclusion 9/8)**.

2.3.2 The meeting reviewed the results of SIGMET tests and agreed to increase the development of periodic SIGMET WV tests to a biannual frequency in order to improve implementation of SIGMET provisions **(Draft conclusion 9/9)**.

2.3.3 The subgroup also agreed to recommend that meteorological authorities, air-traffic services authorities, and volcano observatories (VO) within States coordinate their activities related to the provision and exchange of information about volcanic ash, using established guidance in Annex 3, Annex 15, RANP and the Handbook on the International Airways Volcano Watch **(Draft conclusion 9/10)**.

2.4 **SIGMET implementation**

2.4.1 The subgroup recalled that in the CAR/SAM Regions MWO implementation problems had been detected, and that the temporary delegation of responsibilities from one MWO to another has been a complicated issue. It was also considered that if an MWO is temporarily out of service, another should assume its functions in the shortest possible time, therefore, agreed that in order to ensure the provision of the back-up service without further delays, the designation of the back-up MWO(s) should be shown in the Regional SIGMET Guide **(Draft conclusion 9/11)**.

2.4.2 Considering the above, the meeting agreed that meteorological authorities should review their procedures, in particular those regarding meteorological watch offices, in order to inform Lima and Mexico Regional Offices about changes in the contact information of the ACCs, NOFs, VOs or in MWOs.

2.4.3 It was also agreed that to reduce the problems that persist with the implementation of SIGMET provisions, it is necessary to carry out a seminar/workshop in order to assist States of the CAR/SAM Regions in their efforts towards the elimination of this deficiency (**Draft conclusion 9/12**).

2.5 **Exchange of OPMET information**

2.5.1 The subgroup agreed that in order to solve problems still persisting in OPMET exchange, it is essential that the States/Territories of the CAR/SAM Regions, which have not done so, make the maximum efforts to implement the actions recommended in the COM/MET SIP and GREPECAS related conclusions.

2.5.2 The meeting was aware that the States that decide to implement the use of the public Internet for the applications mentioned in Doc 9855 – *Guidelines on the Use of the Public Internet for Aeronautical Applications,* would have to proceed to the accreditation of the Internet service providers following the guidelines specified in this document (**Draft conclusion 9/13**).

2.5.3 The subgroup noted with concern that during the operational controls carried out by the International OPMET Data Bank from 2004 to 2008, a great number of omissions have been note in OPMET messages in the Brasilia Bank which have a detrimental effect on the provision of MET information to support international air navigation.

2.5.4 The meeting took note with pleasure that in order to identify the deficiencies related with the availability of information in the Brasilia OPMET Bank, Brazil carried out a comparative study of the availability of OPMET messages for the periods from 10 to 16 June from 2004 to 2008.

2.5.5 The meeting was aware that in view of the fact that a new TAF format will be introduced effective 5 November 2008, States should review existing procedures on the provision and processing of the new TAF. In that light, the subgroup agreed to encourage States to provide examples and use the test bed site as referenced above (**Draft conclusion 9/14**).

2.6 **Review of the CAR/SAM ANP/FASID, Part VI - MET**

2.6.1 The subgroup noted that on 20 February 2008 the development of the MET database – Tables MET 1A and 2A was completed, and since then the database is considered operational and is now a "master copy", and any change, except for editorials and omissions which may have occurred, and may require future amendments, will be subject to the standard amendment process to ANP Basic/FASID.

2.6.2 The meeting noted that new database is in alphabetical order and is based on Doc 7910 – *Location Indicators*, and not on FASID Tables AOP. Therefore, there are some differences between the former FASID Tables and the new database. It was also noted that in Doc 7910 - *Location Indicators*, the data of the indicators is in alphabetical order, followed by the "location name", as in FASID Table AOP 1, where the name of the aerodrome is also included. However, during the review of the Tables of the database, it could be verified that the information contained in Doc 7910 is not always aligned with that included in CAR/SAM FASID Table AOP 1.

2.6.3 Considering that in the future a database for the Table AOP will be prepared and, once operational, the MET database will be updated based on that Table, the meeting agreed that the Table AOP of the CAR/SAM Regions and the information contained in Doc 7910, should be reviewed in order that the information contained in both documents is harmonized (**Draft conclusion 9/15**).

2.6.4 The subgroup carried out a review and update of Tables MET 1 A and MET 2A of the database, as well as of the regional meteorological procedures indicated in Part VI – Meteorology of the CAR/SAM ANP Basic/FASID (Doc 8733), in accordance with the structure of the current practices of the operational requirements in the CAR/SAM Region, and proposed amendments to FASID, which are included in **Appendix E** to this working paper (**Draft conclusion 9/16**).

2.7 **Regional MET requirements for ATM**

2.7.1 The subgroup took note that the Third edition – 2007 of the *Global air navigation plan for CNS/ATM systems*, re-titled as ***Global air navigation Plan*** (Doc 9750 AN/963**)**, was prepared in consideration of the operational concept and the Strategic Objectives of the Organization for CNS/ATM systems and contains near and medium term guidance on air navigation system improvements necessary to support a uniform transition to the ATM system. Long-term initiatives will be added to the Global Plan as the technology matures and the supporting provisions are developed.

2.7.2 The meeting took note that the vision of the international civil aviation community and that of ICAO is to achieve a seamless, global ATM system through the implementation of air navigation facilities and services in a progressive, cost-effective and cooperative manner. **Appendix F** to this part of the report presents Figure A-1 of the *Global air navigation plan***,** illustrating the progression of the work of ICAO toward a global ATM system and including the relationship between the various members of the ATM community.

2.7.3 The AERMETSG was aware that ICAO has been addressing the planning strategy at the global and regional levels, leaving the responsibility for undertaking the task of structuring national plans to Contracting States/Territories.

2.7.4 The subgroup was also aware that GREPECAS/14 noted that its ATM/CNS Committee has developed a framework document for updating the CAR/SAM ANP, taking into consideration the *Global Plan*, ICAO Strategic Objectives and Roadmap elements defined in collaboration with industry. In addition, GREPECAS was aware that the ATM/CNS Subgroup had analyzed the document and deemed advisable that the ATM Committee continue to review and update it and agreed that it should be

sent to the other GREPECAS Subgroups for their contribution, with the understanding that approval of the final document would have to wait until all the supplementary parts had been received, therefore, the Subgroup reviewed its Terms of Reference and Work Programme.

2.7.5 The meeting also took note that Project RLA/06/901 – Assistance in the implementation of an ATM regional system, considering the ATM operational concept and the corresponding technological support for communications, navigation and surveillance (CNS), is currently being developed in the SAM Region, with the participation of 9 States of the Region, which includes the necessary AGA, AIS and MET elements, as well as the exchange of experiences concerning processes for the training of personnel in the topics involved.

2.8 Future Work Programme of the AERMET Subgroup

2.8.1 The Meeting reviewed and updated the terms of reference and the work programme of the Subgroup **(Draft Decision 9/18)**, which will be presented in Agenda Item 5 – Management of the GREPECAS Mechanism, item 5.2 – Review of GREPECAS and its Contributory Bodies Work Programme and Terms of Reference. Under this Agenda Item, the meeting noted with concern that implementation of Annex 3 provisions is being affected by the lack of guidance material in English. Therefore, the meeting considered necessary to develop a technical cooperation project for the CAR/SAM Regions, in order to translate traning material and guidance documentation prepared by the Subgroup in Spanish (**Draft conclusion 9/23**).

2.9 Other Matters

2.9.1 The Subgroup unanimously elected Mr. Carlos Roberto Salinas from Paraguay, as Chairman of the AERMET Subgroup and Mr. Steven Albersheim from the United States, as Vice-Chairman, taking into consideration regional balance and representation.

3. Action by the Group

3.1 The Group is invited to review the contents of this working paper and approve the Draft Conclusions included in its Appendix A.

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APPENDIX A

DRAFT CONCLUSIONS AND DECISIONS FORMULATED BY THE AERMETSG/8 MEETING

DRAFT CONCLUSION 9/1 - ACTIVE PARTICIPATION OF CAR/SAM STATES THAT PROVIDE MEMBERS TO THE WAFSOPSG

That, Brazil and Chile should actively participate in the work of the World Area Forecast System Operations Group (WAFSOPSG), as members of the group, in order to guarantee that the specific interest of the CAR/SAM Regions be duly considered in future WAFS planning.

DRAFT CONCLUSION 9/2 - D-VOLMET AERONAUTICAL DATA LINK REQUIREMENTS IN THE CAR/SAM REGIONS

That Part VII – ATS of the ANP be amended in order to reflect the requirement for aeronautical data link D-VOLMET in the CAR/SAM Regions.

DRAFT CONCLUSION 9/3 - TRAINING FOR CAR/SAM STATES REGARDING THE DETAILS AND USE OF NEW WAFS FORECASTS OF CONVECTIVE CLOUDS, ICING AND TURBULENCE DERIVED FROM GRIB 2 CODE FORM

That WAFC Washington, in coordination with WMO, is invited to:

a) starting 2010 or 2011, provide computer based training on the application and usage of new forecasts issued by the WAFS Provider States;

b) assist the States, as needed in English; and

c) evaluate the possibility of providing future training in the operation and use of the new WAFS products in English and Spanish.

DRAFT CONCLUSION 9/4* - INFORMATION ON THE PROGRESS IN UPDATING THE ISCS BROADCAST BY THE WAFC WASHINGTON PROVIDER STATE

That, the WAFC Washington provider State is invited to provide timely reports to States on planned changes to upgrade the ISCS broadcast to G3, taking into consideration the following:

a) provision of resources by States that need to be acquired to switch over to G3; and

b) provision of specifications of what is required by the States.

Note.- The WAFC Washington Provider State will use the ISCS List of contact points for keeping States informed, which is kept up-to-date by the Secretariat.

DRAFT
CONCLUSION 9/5* - DATA MANAGEMENT NOTICES

That, the WAFS Provider State should continue providing data management notices over their circuits on the planned cut over date and scope of the product changes for all ICAO Regions.

*Note: An example of a DM is provided in **Appendix F**.*

DRAFT
CONCLUSION 9/6* - UPDATE TO WAFC WORKSTATIONS TO INGEST OPMET DATA CHANGES

That:

a) the WAFC Washington Provider State will provide States and workstation vendors with the necessary information on the changes to the data products broadcast over the ISCS;

b) the States take the necessary actions to update their workstations for the cut over planned for 31st August 2008 to ingest the global set of OPMET data; and

c) the States may choose to exercise the existing maintenance service contract for their WAFS workstations, which should provide the necessary support to update the ingest database management program.

Note.- Necessary action by the WAFC Washington Provider State and the ICAO Regional Offices have been taken in August 2008 in order to minimize the impact of these changes on ISCS users.

DRAFT
CONCLUSION 9/7 - IMPLEMENTATION PLAN FOR THE TRANSITION FROM GRIB 1 TO GRIB 2 CODE FORM

That, States take note and appropriate action concerning the transition plan for the implementation of GRIB 2 code form adopted by the WAFSOPSG/4 Meeting, presented as **Appendix G** to this part of the report.

DRAFT
CONCLUSION 9/8 - LETTERS OF AGREEMENT BETWEEN THE CIVIL AVIATION AND METEOROLOGICAL AUTHORITIES AND THE VULCANOLOGICAL AGENCY

That, in order to notify with the necessary speed, all the parties involved and mitigate the hazard to air operations within the first few hours following an eruption:

a) the States make full use of Doc 9766-AN/968, *Handbook on the International Airways Volcano Watch (IAVW) - Operational Procedures and Contact List*; and

b) draw up letters of agreement between the parties involved, in particular, the civil aviation and meteorological authorities and the volcano agency, to record the agreed responsibilities of each party.

Note: a sample of letter of agreement is presented in Appendix A to Doc 9766-AN/968.

DRAFT
CONCLUSION 9/9 - INCREASE OF THE FREQUENCY OF PERIODIC SIGMET WV TESTS

That, in order to keep a constant feedback and efficiency in the issuance of volcanic ash SIGMET, the States, in coordination with the corresponding VAACs, carries out periodic tests with a biannual frequency, during the months of May and November. The practices should be of 48 hours.

DRAFT
CONCLUSION 9/10 IMPLEMENTATION OF THE VOLCANO OBSERVATORY NOTICE FOR AVIATION (VONA) FORMAT

That, ICAO encourages States to implement the VONA format to:

a) improve communication of information on volcanic activity to ACC/FIC, VAAC, and MWO; and

b) provide feedback on the utility of the VONA and refinements that should be considered by the International Airways Volcano Watch Operations Group.

DRAFT
CONCLUSION 9/11 - BACK-UP MWOs IN CAR/SAM STATES

That, in order to improve the implementation of a MWO, in case of absence of service or service failure, the Regional Office compiles a list of back-up MWOs to be included in the CAR/SAM Regional SIGMET Guide.

DRAFT
CONCLUSION 9/12 - SEMINAR/WORKSHOP ON SIGMET INFORMATION

That ICAO, in coordination with WMO and VAAC Provider States, organizes a seminar on the preparation issuance and dissemination of SIGMET information.

DRAFT
CONCLUSION 9/13 – CONSIDERATIONS FOR THE USE OF THE PUBLIC INTERNET FOR OPMET EXCHANGE

That the States, when using the public Internet for OPMET information exchange take into account the guidelines specified in Doc. 9855 - *Guidelines on the use of the public*

Internet for aeronautical applications, as well as proposal for amendment to Annex 3 on the use of the public Internet (Chapter 11 and Appendix 10).

DRAFT
CONCLUSION 9/14* - TRANSITION TO NEW TAF FORMAT

That States/Territories in the CAR/SAM Region are encouraged to visit the NWS web site to learn more about the format changes for the TAF and test their processors with the examples provided.

DRAFT
DECISION 9/15 – HARMONIZATION OF THE INFORMATION CONTAINED IN CAR/SAM FASID TABLE AOP 1 AND IN DOC 7910

That in order to harmonize the information contained in Doc 7910 – *"Location Indicators"* and CAR/SAM FASID Table AOP 1, GREPECAS AGA/AOP Subgroup carries out a detail review of the information contained in both documents and, as necessary:

a) update and amend CAR/SAM FASID Table AOP 1, in accordance with the ICAO amendment procedures; and

b) request ICAO to update Doc 7910.

DRAFT
CONCLUSION 9/16 – PROPOSAL FOR AMENDMENT TO CAR/SAM ANP FASID, PART VI – MET

That the CAR/SAM Facilities and Services Implementation Document, CAR/SAM FASID, be amended as indicated in Appendix A to this part of the report.

DRAFT
DECISION 9/18 - AERMET SUBGROUP NEW TERMS OF REFERENCE AND WORK PROGRAMME

That the AERMET subgroup terms of reference and work programme is updated as indicated under **Appendix C** to this part of the report.

DRAFT
CONCLUSION 9/23 - TECHNICAL COOPERATION PROJECT FOR THE TRANSLATION OF TRAINING MATERIAL AND GUIDANCE DOCUMENTATION PREPARED BY THE SUBGROUP IN SPANISH

That, a technical cooperation project be carried out for CAR/SAM States/Territories for the translation of training material and guidance documentation prepared by the AERMET Subgroup.

* Approval was requested through the GREPECAS Fast Track procedure.

APPENDIX B

CONCLUSIONS/DECISIONS IN THE MET FIELD OF GREPECAS PREVIOUS MEETINGS

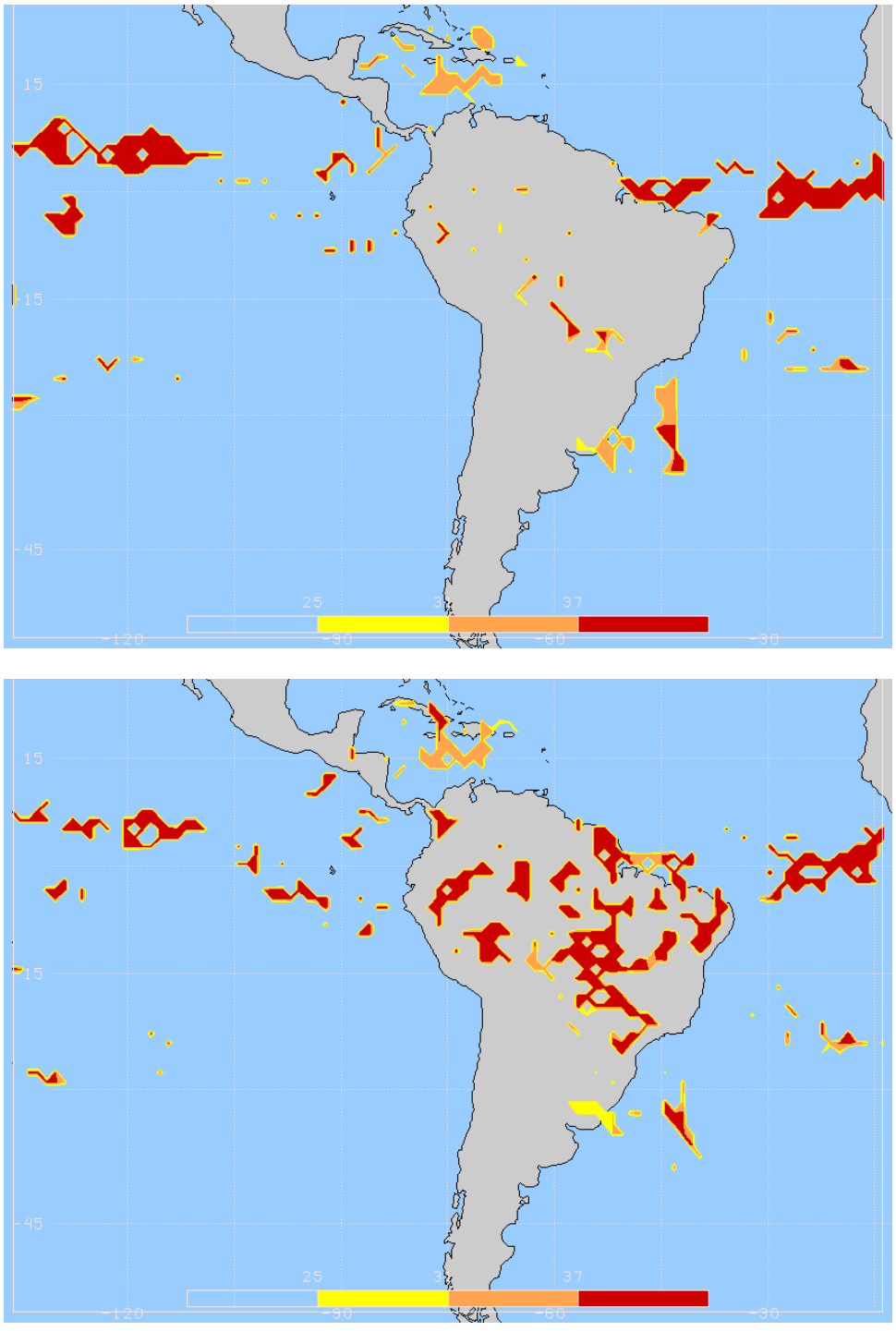
Reference Report Conc./Dec.	Conclusions/Decisions	Subsequent Action by ICAO and/or by States/Territories International Organizations
Conc. 10/39	**Training of Aeronautical Meteorological personnel** That ICAO develop and implement a joint project with the WMO to provide short and long term solutions to the lack of trained personnel in the aeronautical meteorological field faced by most of the States in the CAR/SAM Regions.	**Valid**
Conc. 11/60	**Second CAR/SAM Regional Workshop on Aeronautical Meteorology services costs recovery** That ICAO, in close coordination with the WMO, organizes and holds, as soon as possible, the Second Regional Workshop on aeronautical meteorology services costs recovery.	**Completed** The seminar was carried out from 13 to 15 December 2006 in Dominican Republic.
Conc. 12/54	**Active participation of Peru and Brazil in the WAFSOPSG** That Brazil and Peru, as members of the WAFSOPSG, participate actively in the tasks of the Group in order to make sure that specific interests of the CAR/SAM Regions are duly taken into account in the future planning of the WAFS.	**Valid** The member of Perú has only participated in one (WAFSPOPSG/1, Lima, Peru, 10 – 13 November 2003), of the four meetings carried out to date. RMKS: It is considered valid in order to keep a record of assistance.
Conc. 12/56	**Updating of the International Airways Volcano Watch contact list in CAR/SAM States/Territories/International Organizations** That CAR/SAM States/Territories/International Organizations notify the Lima and Mexico Offices of any changes in the International Airways Volcano Watch (IAVW) contact list.	**Valid** Problems for the States to inform ICAO Regional Offices of the changes in the contact information still persist.
Conc. 12/57	**Implementation of SIGMET requirements** That the Lima and Mexico Regional Offices: a) conduct surveys in the CAR/SAM Regions on the issuance of SIGMET messages, particularly those for volcanic ash, in coordination with WMO, and issue a list of deficiencies for follow-up measures; and b) starting in 2004 until 2007, conduct periodical tests on the issuance and reception of SIGMET messages for volcanic ash, during the first week of March and September.	**Completed**

Reference Report Conc./Dec.	Conclusions/Decisions	Subsequent Action by ICAO and/or by States/Territories International Organizations
Conc. 12/58	**Active participation of Argentina as member of the IAVWOPSG** That Argentina, as Member of the IAVWOPSG, participate actively in the work of the group to ensure that the specific interests of the CAR/SAM Regions are taken into account in the future planning of the IAVW.	**Valid** The member of Argentina has only participated in two of the three meetings carried out to date. RMKS: It is considered valid, in order to keep a record of assistance.
Conc. 12/66	**Training on quality management of MET services in the CAR/SAM Regions** That WMO organize, in coordination with ICAO, a series of training activities on quality management of meteorological services provided to support international air navigation in the CAR/SAM Regions.	**Completed** The seminar was carried out from 13 to 15 December 2006 in Dominican Republic.
Conc. 12/67	**Quality assurance systems for Meteorological services in the CAR/SAM Regions** That CAR/SAM States/Territories/International Organizations make utmost efforts to establish quality assurance systems for meteorological services provided in support of international air navigation in the CAR/SAM Regions.	**Valid**
Conc. 13/16	**Cost recovery of MET services in the CAR/SAM Regions** That the States/Territories/International Organizations, in coordination with the aeronautical meteorological authorities: a) establish a method for recovering the costs of aeronautical meteorological services provided in their territory, through the application of charges for air navigation services; and b) include the cost related to the reception and provision of WAFS products, especially charges for the replacement or improvement of workstations and the WAFS software required for receiving these products in GRIB and BUFR codes, and maintenance of the ISCS1 (VSAT) workstation.	**Valid**
Conc. 13/17	**Survey on ISCS efficacy** That ICAO a) consult with CAR/SAM States/Territories in order to develop a list of ISCS focal points; and b) in coordination with the WAFS provider State, develop and send to the focal points a survey on ISCS efficacy.	**Completed**

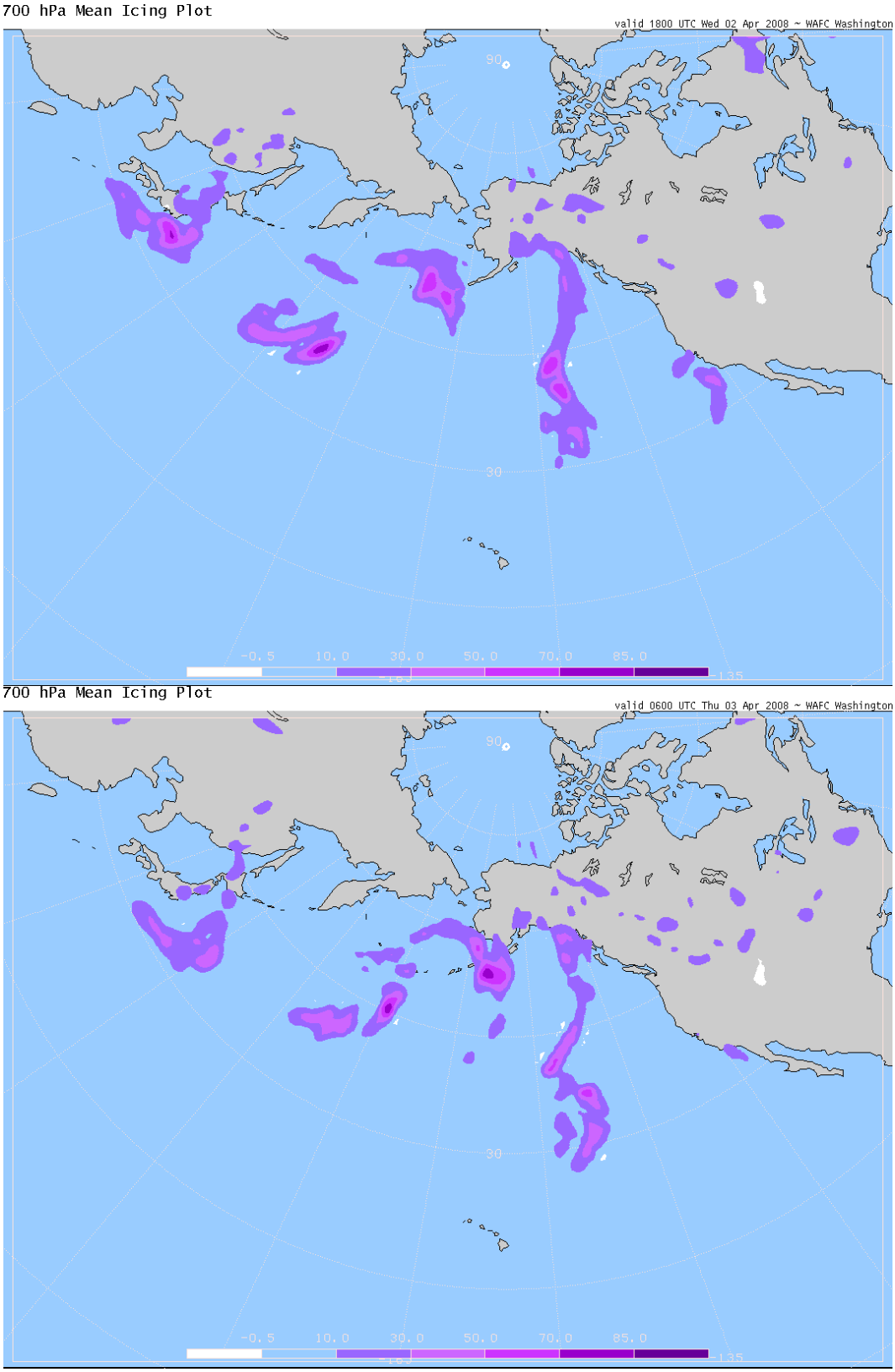
Reference Report Conc./Dec.	Conclusions/Decisions	Subsequent Action by ICAO and/or by States/Territories International Organizations
Conc. 13/19	**Provision of results of GFS model runs by the Washington WAFC** That the WAFSOPSG consider the possibility for the Washington WAFC to disseminate the analysis of the Global Forecast System (GFS) model run to user States concerned.	**Completed** The WAFOPSG in its Fourth Meeting considered that, in accordance with the *Working Arrangements between the ICAO and WMO* (Doc 7475), analysis of model runs not be disseminated on ICAO AFS satellite Broadcast, which was reflected in Conclusion 3/10.
Conc. 13/20	**Periodic tests on volcanic ash SIGMETS, volcanic ash advisories, and volcanic ash ASHTAMs or NOTAMs** That ICAO invite the Washington and Buenos Aires VAACs and the CAR/SAM NOFs and MWOs to take active part in periodic tests of SIGMETs (WV), volcanic ash advisories, and volcanic ash ASHTAMs or NOTAMs to be carried out according to the procedures agreed by the AERMET Subgroup.	**Completed**
Dec. 13/23	**Development of a Guide for the drafting of emergency plans for aerodromes that might be affected by volcanic ash in the CAR/SAM Regions** That the AERMET Subgroup, in coordination with the Secretariat, develops a guide for the drafting of emergency plans for aerodromes that might be affected by volcanic ash in the CAR/SAM Regions.	**Valid**
Conc. 13/24	**Development of a system for early detection of volcanic activity using remote sensors** That the IAVWOPSG member from the Buenos Aires VAAC include information on the development of a system for early detection of volcanic activity using remote sensors in the executive report to be presented to the IAVWOPSG/2 meeting.	**Completed**
Dec. 13/28	**Guide for the exchange of OPMET information in the CAR/SAM Regions** That the AERMETSG Subgroup, in coordination with the Secretariat, develops a Guide for the exchange of OPMET information in the CAR/SAM Regions.	**Valid**

APPENDIX C

The following are examples of trial products of convection, icing potential, and clear-air-turbulence. These trials do not represent any final visualization scheme of the WAFS SIGWX forecast; rather they are first version trials.



Samples SIGWX forecast of convection, contoured with heights of CB tops, valid at 6 and 12 after model time.



Sample SIGWX forecasts of icing at 700 hPa (FL100) valid at 12 hours (above) and 24 hours (below) after model time.

APPENDIX D

ISCS 2005-2006 SURVEY RESPONSE SUMMARY IN CAR/SAM STATES/TERRITORIES

State	No. VSAT	Loc	Type	4. ISCS Broadcast																
				(a) Signal Qual			(b)(i) WAFS T4			(b)(ii) WAFS U-A			(b)(iii) WAFS SIGWX			(b)(iv) OPMET DATA			(b)(v) ADMIN MSG		
				Accept	%-Acpt	Not-Acpt	Accept	%-Acpt	Not-Acpt	Accept	%-Acpt	Not-Acpt	Accept	%-Acpt	Not-Acpt	Accept	%-Acpt	Not-Acpt	Accept	%-Acpt	Not-Acpt
Argentina	1	Serv Met NAC	Corbor	1						1			1			1			1		
Chile	1	Santiago	Morcom		1				1		1				1		1				1
Columbia	2	Aero. El Dorado Bogota	Meteostar	1			1			1			1			1			1		
Cuba	2	Aero. Intl. Jose Marti La Habana	InfoSystem	1			1			1			1			1					
Equador	1	MET APTO, Mariscal Sucre	NETSYS	1				1			1		1				1				
French Guiana	1	Rochambeau Airport	Synergie	1			1			1			1			1			1		
Guyana	1	CIAL Airport	Corbor	1			1			1					1	1				1	
Mexico	1	Aero. Intl. de la Ciudad de Mexico	Morcom	1			1			1			1			1			1		
Trinada and Tobago	1	PIARCO	Corbor	1			1			1				1		1				1	
Puerto Rico and US Virgin Is.	1	WFO San Juan	GST Metlab	1			1			1			1			1			1		
Venezuela	1	Aero. Intl. Simon Bolivar	UNKNOWN	1			1			1			1			1					1
			Avg	0.9091	0.0909	0	0.8	0.1	0.1	0.7273	0.2727	0	0.7273	0.0909	0.18182	0.8182	0.1818	0	0.5556	0.2222	0.22222
			Green	0.9091			0.8			0.7273			0.7273			0.8182			0.5556		
			Yellow		0.0909			0.1			0.2727			0.0909			0.1818			0.2222	
			Red			0			0.1			0			0.18182			0			0.22222
			Neutral																		

State	No. VSAT	Loc	Type	5. VSAT Reliability							6. SIGWX		7. If no SIGWX BUFR			8. Helpline		
				(a) Receiver			(b) VSAT Repair		Scv Pb		fm BUFR		Use PNG Fmt			Called Help Desk		
				Accept	%-Acpt	Not-Acpt	LocTech	Shp2Svc	Yes	No	Yes	No	No	Yes.Xtnd	Yes/NoXtd	No	Sat Svc	Unsat Svc
Argentina	1	Serv Met NAC	Corbor	1							1					1		
Chile	1	Santiago	Morcom		1			1		1		1	1			1		
Columbia	2	Aero. El Dorado Bogota	Meteostar	1			1				1		1		1	1		
Cuba	2	Aero. Intl. Jose Marti La Habana	InfoSystem	1								1		1			1	
Equador	1	MET APTO, Mariscal Sucre	NETSYS	1			1				1					1		
French Guiana	1	Rochambeau Airport	Synergie	1			1				1			1			1	
Guyana	1	CI'IAL Airport	Corbor	1			1	1		1	1			1			1	
Mexico	1	Aero. Intl. de la Ciudad de Mexico	Morcom	1				1		1	1					1		
Trinada and Tobago	1	PIARCO	Corbor	1							1						1	
Puerto Rico and US Virgin Is.	1	WFO San Juan	GST Metlab	1			1				1					1		
Venezuela	1	Aero, Intl. Simon Bolivar	UNKNOWN	1								1	1			1		
			Avg	0.9091	0.0909	0	0.64286	0.35714	0	1	0.7273	0.2727	0.5	0.5	0	1	1	0
			Green	0.9091						1	0.7273						1	
			Yellow		0.0909													
			Red			0			0			0.2727	0.5					0
			Neutral				0.64286	0.35714					0.5	0.5	0	1		

APPENDIX E

Part VI

METEOROLOGY (MET)

FASID

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EXCHANGE OF MET INFORMATION
FOR OPERATIONS
(FASID Tables MET 2A and MET 2B)

4. ~~Reports in the METAR/SPECI code forms and aerodrome forecasts in the TAF code form required in ISCS and SADIS are shown in FASID Table MET 2A.~~The requirements for availability of OPMET information METAR, SPECI and TAF on a global basis through the AFS satellite distribution system (the ISCS and SADIS Broadcast and the associated internet based distribution system (SADIS FTP and ISCS…) are included in FASID Table MET 2A. This table contains the aerodromes included in the CAR/SAM FASID Table AOP and those non-AOP aerodromes for which the States concerned have agreed to make available the OPMET information via the satellite distribution system on a regular basis.

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Table MET 1A - Tableau MET 1A - Tabla MET 1A

Aerodrome where service is required Aérodrome où le service doit être assuré Aeródromo donde se requiere el servicio			Responsible MET Office Centre MET responsable Oficina MET responsable		Forecasts to be provided Prévisions à fournir Pronósticos a suministrar		
Name Nom Nombre	ICAO loc. ind. Ind. d'empl OACI Ind. lugar OACI.	Use Vocation Uso	Name Nom Nombre	ICAO loc. ind. Ind. d'empl. OACI Ind. lugar OACI	Trend Tendance Tendencia	TAF 18h	TAF 24h
1	2	3	4	5	6	7	8
…							
BRAZIL							
BELEM/Val de Caes	SBBE	RS	MANAUS/CINDACTA IV, AM~~BELEM/Val de Caes~~	SBAZ~~SBBE~~			X
BELO HORIZONTE/Tancredo Neves	SBCF	RS	RIO DE JANEIRO/Antonio Carlos Jobim Intl	SBGL			X
BOA VISTA/Boa Vista Intl	SBBV	RS	MANAUS/ CINDACTA IV, AM~~Eduardo Gomes~~	SBAZ~~SBEG~~			X
BRASILIA/Pres. Juscelino Kubitschek, DF	SBBR	RS	BRASILIA/CINDACTA I, DF~~Brasília Intl~~	SBBS~~SBBR~~			X
CAMPINAS/Viracopos	SBKP	RS	SAO PAULO/Guarulhos Intl	SBGR			X
CAMPO GRANDE/Campo Grande Intl	SBCG	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
CORUMBA/Corumba Intl	SBCR	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
CRUZEIRO DO SUL/Cruzeiro do Sul Inl	SBCZ	RS	MANAUS/CINDACTA IV, AM~~Eduardo Gomes~~	SBAZ~~SBEG~~			X
CUIABA/Marechal Rondon	SBCY	RS	BRASILIA/CINDACTA I~~Brasília Intl~~	SBBS~~SBBR~~			X
CURITIBA/Afonso Pena	SBCT	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
FLORIANÓPOLIS/Hercílio Luz Intl	SBFL	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
FORTALEZA/Pinto Martins	SBFZ	RS	RECIFE/CINDACTA III, PE~~Guararapes~~	SBRE~~SBRF~~			X
FOZ DO IGUAÇU/Cataratas	SBFI	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
MACAPA/Macapa Intl	SBMQ	RS	MANAUS/CINDACTA IV, AM~~BELEM/Val de Caes~~	SBAZ~~SBBE~~			X
MACEIO/Zumbi dos Palmares Intl.	SBMO	RS	RECIFE/CINDACTA III, PE~~Guararapes~~	SBRE~~SBRF~~			X
MANAUS/Eduardo Gomes	SBEG	RS	MANAUS/CINDACTA IV, AM~~Eduardo Gomes~~	SBAZ~~SBEG~~			X
NATAL/Augusto Severo	SBNT	AS	RECIFE/CINDACTA IV~~Guararapes~~ – CINDACTA III~~GILBERTO FREYRE,~~ PE	SBRE~~SBRF~~			X
PONTA PORA/Ponta Pora Intl	SBPP	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
PORTO ALEGRE/Salgado Filho	SBPA	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
RECIFE/Guararapes	SBRF	RS	RECIFE/CINDACTA III~~Guararapes~~	SBRE~~SBRF~~			X
RIO DE JANEIRO/Galeao, Antonio Carlos Jobim Intl	SBGL	RS	RIO DE JANEIRO/Galeao, Antonio Carlos Jobim Intl	SBGL			X

Aerodrome where service is required Aérodrome où le service doit être assuré Aeródromo donde se requiere el servicio			Responsible MET Office Centre MET responsable Oficina MET responsable		Forecasts to be provided Prévisions à fournir Pronósticos a suministrar		
Name Nom Nombre	ICAO loc. ind. Ind. d'empl OACI Ind. lugar OACI.	Use Vocation Uso	Name Nom Nombre	ICAO loc. ind. Ind. d'empl. OACI Ind. lugar OACI	Trend Tendance Tendencia	TAF 18h	TAF 24h
1	2	3	4	5	6	7	8
SALVADOR/Deputado Luis Eduardo Magalhaes	SBSV	RS	RECIFE/CINDACTA IIIGuararapes	SBRESBRF			X
SANTAREM/Santarém Intl	SBSN	AS	MANAUS/CINDACTA IV, AMBELEM/Val de Caes	SBAZSBBE			X
SAO LUÍS/Marechal Cunha Machado	SBSL	AS	MANAUS/CINDACTA IV, AMBELEM-Val de Caes	SBAZSBBE			X
SAO PAULO/Guarulhos Intl	SBGR	RS	SAO PAULO/Guarulhos Intl	SBGR			X
TABATINGA/Tabatinga Intl	SBTT	RS	MANAUS/CINDACTA IV, AMEduardo Gomes	SBAZSBEG			X
URUGUAIANA/Rubem Berta	SBUG	RS	PORTO ALEGRE/Salgado Filho	SBPA			X
…							
CHILE							
ANTOFAGASTA/Cerro Moreno	SCFA	AS	ANTOFAGASTA/Cerro Moreno	SCFA	X		X
ARICA/Chacalluta	SCAR	RS	ANTOFAGASTA/Cerro Moreno	SCARSCFA			X
CONCEPCION/Carriel Sur	SCIE	RS	SANTIAGO/Arturo Merino Benítez	SCIESCEL			X
IQUIQUE/Gral Diego Aracena Intl.	SCDA	RS	ANTOFAGASTA/Cerro Moreno	SCDASCFA			X
PUERTO MONTT/El Tepual	SCTE	RS	PUERTO MONTT/El Tepual	SCTE	X		X
PUNTA ARENAS/Pdte. C. Ibañez del Campo	SCCI	AS	PUNTA ARENAS/Pdte. C. Ibañez del Campo	SCCI	X		X
SANTIAGO/Arturo Merino Benitez	SCEL	RS	SANTIAGO/Arturo Merino Benitez	SCEL	X		X
COLOMBIA							
BOGOTA/Eldorado	SKBO	RS	BOGOTA/Eldorado	SKBO	X		X
BARRANQUILLA/Ernesto Cortissoz	SKBQ	RS	BARRANQUILLA/Ernesto Cortissoz	SKBQ	X		X
CALI/Alfonso Bonilla Aragón	SKCL	RS	CALI/Alfonso Bonilla Aragón	SKCL	X		X
CARTAGENA/Rafael Núñez	SKCG	RS	CARTAGENA/Rafael Núñez	SKCG			X
CUCUTA/Camilo Daza	SKCC	RNS&AS	CUCUTA/Camilo Daza	SKCC			X
LETICIA/Alfredo Vásquez Cobo	SKLT	RNS&AS	SANTA FE DE BOGOTA/Eldorado	SKBO			X
RIONEGRO/José María Córdoba	SKRG	RS	RIONEGRO/José María Córdoba	SKRG	X		X
SAN ANDRES I./Sesquicentenario	SKSP	RS	SAN ANDRES I./Sesquicentenario	SKSP			X
…							

Table MET 1B — Tabla MET 1B

METEOROLOGICAL WATCH OFFICES
OFICINAS DE VIGILANCIA METEOROLÓGICA

MWO location Emplacement du MWO Lugar de la MWO	ICAO loc.ind. Ind. d'empl. OACI Ind. lugar OACI	Area served/Région desservie/Zona atendida		Remarks Remarques Observaciones
		Name Nom Nombre	ICAO loc. ind. Ind. d'empl. OACI Ind. lugar OACI	
1	2	3	4	5
.....				
CHILE				
ANTOFAGASTA/Cerro Moreno	SCFA	Antofagasta FIR/SRR	SCFZ	During the night SCEL assumes functions of Meteorological Watch Office for the FIR / En horario nocturne SCEL assume las funciones de oficina de vigilancia meteorological para la FIR.
SANTIAGO/Arturo Merino Benítez	SCEL			
PUERTO MONTT/El Tepual	SCTE	Puerto Montt FIR/SRR	SCTZ	
PUNTA ARENAS/Pdte. C. Ibañez del Campo	SCCI	Punta Arenas FIR/SRR	SCCZ	
SANTIAGO/Arturo Merino Benitez	SCEL	Santiago FIR/SRR	SCEZ	Assumes functions of Meteorological watch in absence of another WMO / Asume funciones dee vigilancia en ausencia de otra MWO.
.....				
UNITED STATES				
Kansas City Aviation Weather Center	KKCI	Houston Oceanic FIR Miami Oceanic FIR/SRR ~~Nassau FIR~~ San Juan FIR/SRR	KZHU KZMA ~~MYNA~~ TJZS	
.....				

Table MET 2A — Tabla MET 2A

~~Availability of~~ OPMET information (METAR, SPECI and TAF) required in ISCS and SADIS

~~www.icao.int/anb/sadisopsg/sug/sug_annex1.pdf~~

Note: FASID Table MET 2A is a global table showing the current requirements for OPMET information (METAR/SPECI and TAF) from all ICAO Regions necessary for the international air navigation. FASID Table MET2A is available on: www.icao.int/anb/sadisopsg/sug/sug_annex1.pdf and is regularly updated through the ICAO Regional Offices based on identified user agreements and in consultation with the States concerned.

~~Disponibilidad de i~~Información OPMET (METAR, SPECI Y TAF) requerida en el ISCS y en el SADIS

Nota: La Tabla MET 2A del FASID es una tabla global que muestra los requerimientos actuales de información OPMET (METAR/SPECI y TAF) de todas las Regiones de la OACI necesarios para la navegación aérea internacional. La Tabla MET 2A del FASID está disponible en: www.icao.int/anb/sadisopsg/sug/sug_annex1.pdf y es actualizada regularmente a través de las Oficinas Regionales de la OACI basadas en acuerdos de los usuarios identificados y en consulta con los Estados concernientes.

Table MET 2A — Tabla MET 2A

Aerodrome where service is to be provided			OPMET to be provided			
Listed in AOP Tables	Not Listed in AOP Tables	ICAO Location	SA/SP	FC	FT	Remark
1	2	3	4	5	6	7
.....						
Bolivia						
	COBIJA	SLCO	Y		Y	Only in the daytime
COCHABAMA		SLCB	Y		Y	
	EL TROMPILLO	SLET	Y		Y	Only in the daytime
LA PAZ		SLLP	Y		Y	
	POTOSI	SLPO	Y			Only in the daytime
	PUERTO SUAREZ	SLPS	Y		Y	Only in the daytime
	SUCRE	SLSU	Y		Y	Only in the daytime
TARIJA		SLTJ	Y		Y	Only in the daytime
TRINIDAD		SLTR	Y		Y	Only in the daytime
VIRU VIRU		SLVR	Y		Y	~~Only in the daytime~~
Peru						
	ANDAHUAYLAS	SPHY	Y		Y	
AREQUIPA		SPQU	Y		Y	
	AYACUCHO/CORONEL FAP ALFREDO MENDIVIL DUARTE	SPHO	Y		Y	
	CAJAMARCA/MAYOR GENERAL FAP ARMANDO REVOREDO IGLEXIAS	SPJR	Y		Y	
	~~*CELENDIN*~~	~~SPLD~~	~~Y~~		~~Y~~	
CHICLAYO/CAP. JOSE ABELARDO QUIÑONES GONZALES		SPHI	Y		Y	
CUSCO/VELAZCO ASTETE		SPZO	Y		Y	
	ILO	SPLO	Y		Y	
IQUITOS/CORONEL FAP FRANCISCO SECADA VIGNETTA		SPQT	Y		Y	
	JUANJUI	SPJI	Y	~~Y~~		
	JULIACA	SPJL	Y		Y	
LIMA-CALLAO/INTL JORGE CHAVEZ		SPIM	Y		Y	
PISCO		SPSO	Y		Y	
	PTO. MALDONADO/PADRE ALDAMIZ	SPTU	Y			
	PUCALLPA/DAVID ABENSUR R.	SPCL	Y		Y	
TACNA/CORONEL FAP CARLOS CIRIANI SANTA ROSA		SPTN	Y		Y	
	TALARA/CAPITAN MONTES	SPYL	Y		Y	
	TARAPOTO/CDTE. GUILLERMO DEL CASTILLO PAREDES	SPST	Y		Y	
	TINGO MARIA	SPGM	Y	~~Y~~		
TRUJILLO/CAPITAN CARLOS MARTINEZ DE PINILOS		SPRU	Y		Y	
	TUMBES/PEDRO CANGA	SPME	Y			
	YURIMAGUAS/MOISES BENZAQUEN RENGIFO	SPMS	Y	~~Y~~		
.....						

TO BE AVAILABLE IN/ESTARÁN DISPONIBLES EN

FROM/DE	ICAO Loc. Ind./Ind. Lugar OACI	Anguilla I. (U.K.)	Antigua and Barbuda	Argentina	Aruba (Netherlands)	Bahamas	Barbados	Belize	Bolivia	Brazil	Cayman Is. (U.K.)	Chile	Colombia	Costa Rica	Cuba	Dominica	Dominican Republic	Ecuador	El Salvador	French Antilles (France)	French Guiana (France)	Grenada	Guatemala	Guyana	Haití	Honduras	Jamaica	Mexico	Montserrat I. (U.K.)	Netherland Antilles (Netherlands)	Nicaragua	Panama	Paraguay	Peru	Puerto Rico (U.S.)	Saint Kitts and Nevis	Saint Lucia	S. Vincent and the Grenadines	Suriname	Trinidad and Tobago	Turks and Caicos Islands (U.K.)	Uruguay	Venezuela	Virgin Islands (U.K.)	Virgin Islands (U.S.)	Brasilia/Washington OPMET Data Banks	SADIS and ISCS Uplink Stations/ Estaciones de Enlace Ascendente ISCS y SADIS
CAR																																															
…..																																															
CUBA																																															
Camaguey/Ignacio Agramonte Intl	MUCM			T			T							F										T			F	T						T												F	F
Caryo Coco ~~Intl.~~/Jardines del Rey Intl	*MUCC*																																													*F*	*F*
Cayo Largo del Sur/Vilo Acuña Intl	MUCL																																													F	F
Ciego de Avila	MUCA			T			T							F										T			F	T						T												F	F
~~Guantánamo US Naval Base~~	*~~MUGT~~*																																													*~~F~~*	*~~F~~*
La Habana/José Martí Intl	MUHA			T		F	T		F	T		T	T	F			F	T						T			F	T		F	F	F		T	F								F			F	F
Holguin/Frank País Intl	MUHG			T		F	T		F	T		T	T	F			F	T						T			F	T		F	F	F		T	F								F			F	F
Santiago de Cuba/Antonio Maceo Intl	MUCU												T				F										F																			F	F
Varadero/Juan Gualberto Gómez Intl	MUVR			T									T				F															F		T									F			F	F
…..																																															
MEXICO																																															
Acapulco	MMAA			T		T				T			T	F	F			T	F				F			T						F		T												F	F
Aguascalientes	*MMAS*																																													*F*	*F*
Bahias de Huatulco	MMBT																																													F	F
Campeche	MMCP			T																																										F	F
Cancun	MMUN					F							T		F		F									F	T					F		T												F	F
Chetumal	MMCM																																													F	F
Chihuahua	MMCU																																													F	F
Ciudad Acuña	MMMC																																													F	F
Ciudad Del Carmen	*MMCE*																																													*F*	*F*
Ciudad Juarez	MMCS																																													F	F
Ciudad Obregón	*MMCN*																																													*F*	*F*
Ciudad Victoria	*MMCV*																																													*F*	*F*
Colima	*MMIA*																																													*F*	*F*
Cozumel	MMCZ					F	T	F			F			F	F				F				F			T					F	F		T	T											F	F
Culiacan	MMCL																	T																												F	F
Cuernavaca	*MMCB*																																													*F*	
Durango	MMDO																																													F	F
Guadalajara	MMGL			T		F				T			T		F			T																T												F	F
Guaymas	MMGM																																													F	F
Hermosillo	MMHO																																													F	F
Ixtapa-Zihuatanejo	MMZH																																													F	F
Jalapa	*MMJA*																																													*F*	
La Paz	MMLP																		F																											F	F

TO BE AVAILABLE IN/ESTARÁN DISPONIBLES EN

	ICAO Loc. Ind./Ind. Lugar OACI	Anguilla I. (U.K.)	Antigua and Barbuda	Argentina	Aruba (Netherlands)	Bahamas	Barbados	Belize	Bolivia	Brazil	Cayman Is. (U.K.)	Chile	Colombia	Costa Rica	Cuba	Dominica	Dominican Republic	Ecuador	El Salvador	French Antilles (France)	French Guiana (France)	Grenada	Guatemala	Guyana	Haití	Honduras	Jamaica	Mexico	Montserrat I. (U.K.)	Netherland Antilles (Netherlands)	Nicaragua	Panama	Paraguay	Peru	Puerto Rico (U.S.)	Saint Kitts and Nevis	Saint Lucia	S. Vincent and the Grenadines	Suriname	Trinidad and Tobago	Turks and Caicos Islands (U.K.)	Uruguay	Venezuela	Virgin Islands (U.K.)	Virgin Islands (U.S.)	Brasilia/Washington OPMET Data Banks	SADIS and ISCS Uplink Stations/ Estaciones de Enlace Ascendente ISCS y SADIS
Lázaro Cárdenas	*MMLC*																																													*F*	
Leon	MMLO																																													F	F
Loreto	MMLT																																													F	F
Los Mochis	*MMLM*																																													*F*	
Manzanillo	MMZO																																													F	F
Matamoros	MMMA														F			T														F														F	F
Mazatlan	MMMZ			T															F																											F	F
Merida	MMMD					F	T	F			F			F	F				F				F		F	T					F	F		T	F											F	F
Mexicali	MMML																																													F	F
Mexico	MMMX			T		T		F	F	T		T	T	F	F		F	T	F				F			F					F	F		T	T								F			F	F
Minatitlán	*MMMT*																																													*F*	
Monterrey/Del Norte Intl.	MMAN																	T														F											F			F	F
Monterrey/Gral.Mariano Escobedo	MMMY																	T														F														F	F
Morelia	MMMM																																													F	F
Nogales	MMNG																																													F	F
Nuevo Laredo	MMNL																																													F	F
Oaxaca	*MMOX*																																													*F*	*F*
Piedras Negras	MMPG																																													F	F
Poza Rica	*MMPA*																																													*F*	
Puebla	*MMPB*																																													*F*	
Puerto Escondido Intl	*MMPS*																																													*F*	*F*
Puerto Vallarta	MMPR			T		T		F	F	T		T	T	F	F		F	T	F				F			F					F	F		T	T											F	F
Queretaro	*MMQT*																																													*F*	
Reynosa	MMRX																																													F	F
Saltillo	*MMIO*																																													*F*	
San Felipe	MMSF																																													F	F
San Jose del Cabo	MMSD			T															F																											F	F
San Luis Potosi	*MMSP*																																													*F*	*F*
Tampico	MMTM			T		T		F	F	T		T	T	F	F		F	T	F				F			F					F	F		T	T											F	F
Tapachula	MMTP																		F																											F	F
Tepic	*MMEP*																																													*F*	
Tijuana	MMTJ																																													F	F
Toluca	MMTO																																													F	F
Torreón	MMTC																	T														F														F	F
Tuxtla Gutiérrez	*MMTG*																																													*F*	
Uruapán	*MMPN*																																													*F*	
Veracruz	MMVR			T		T		F	F	T		T	T	F	F		F	T	F				F			F					F	F		T	T											F	F
Villahermosa	MMVA																																													F	F
Zacatecas	MMZC																																													F	F
…..																																															

TO BE AVAILABLE IN/ESTARÁN DISPONIBLES EN																																															
	ICAO Loc. Ind./Ind. Lugar OACI	Anguilla I. (U.K.)	Antigua and Barbuda	Argentina	Aruba (Netherlands)	Bahamas	Barbados	Belize	Bolivia	Brazil	Cayman Is. (U.K.)	Chile	Colombia	Costa Rica	Cuba	Dominica	Dominican Republic	Ecuador	El Salvador	French Antilles (France)	French Guiana (France)	Grenada	Guatemala	Guyana	Haití	Honduras	Jamaica	Mexico	Montserrat I. (U.K.)	Netherland Antilles (Netherlands)	Nicaragua	Panama	Paraguay	Peru	Puerto Rico (U.S.)	Saint Kitts and Nevis	Saint Lucia	S. Vincent and the Grenadines	Suriname	Trinidad and Tobago	Turks and Caicos Islands (U.K.)	Uruguay	Venezuela	Virgin Islands (U.K.)	Virgin Islands (U.S.)	Brasilia/Washington OPMET Data Banks	SADIS and ISCS Uplink Stations/ Estaciones de Enlace Ascendente ISCS y SADIS
SAM																																															
…..																																															
BOLIVIA																																															
Cobija	*SLCO*																																													*F*	*F*
Cochabamba	SLCB			F						T																						T	F	F									T			F	F
El Trompillo	*SLET*																																													*F*	*F*
La Paz	SLLP			F	~~F~~					F		F	F					T										T				F	F	F								F	T			F	F
Potosi	*SLPO*																																													*F*	*F*
Puerto Suarez	*SLPS*																																													*F*	*F*
Santa Cruz	SLVR			F						F		F	F																			F	F	F								F	T			F	F
Sucre	*SLSU*																																													*F*	*F*
Tarija	SLTJ			F						T																							F	F									T			F	F
Trinidad	SLTR																																F													F	F
…..																																															
CHILE																																															
Antofagasta	SCFA			F					F	T			T																			F		F												F	F
Arica	SCAR			F					F				T																			F	F	F												F	F
Balmaceda	*SCBA*																																													*F*	*F*
Calama	*SCCF*									*T*																																				*F*	*F*
Concepción	SCIE			F						~~T~~								T															F	F								F	T			F	F
Iquique	SCDA								F																								F	T												F	F
La Serena	*SCSE*																																													*F*	*F*
Osorno	*SCJO*																																													*F*	*F*
Puerto Montt	SCTE			F					F																									T												F	F
Punta Arenas	SCCI			F					F																																					F	F
Santiago/Arturo Merino Benitez	SCEL			F					F	F			T					T														F	F	F								F	T			F	F
…..																																															
PANAMA																																															
Bocas del Toro	MPBO																																													~~F~~	~~F~~
Changuinola	MPCH																																													~~F~~	~~F~~
David	MPDA			T	F	F			F	F	F	T	F	F	F		F	F	T				F		T	F	F	F		F	F			F	F					F			F			F	F
Panamá/Marco A. Gelabert	MPMG			T	F	F			F	F	F	T	F	F	F		F	F	T				F		T	F	F	F		F	F			F	F					F			F			F	F
Panamá/Tocumen	MPTO			T	F	F			F	F	F	T	F	F	F		F	F	T				F		T	F	F	F		F	F			F	F					F			F			F	F
…..																																															
PERU																																															
Andahuaylas	*SPHY*																																													*F*	*F*
Arequipa	SPQU											F																																		F	F
Ayacucho	*SPHO*																																													*F*	*F*
Cajamarca	*SPJR*																																													*F*	*F*

TO BE AVAILABLE IN/ESTARÁN DISPONIBLES EN

	ICAO Loc. Ind./Ind. Lugar OACI	Anguilla I. (U.K.)	Antigua and Barbuda	Argentina	Aruba (Netherlands)	Bahamas	Barbados	Belize	Bolivia	Brazil	Cayman Is. (U.K.)	Chile	Colombia	Costa Rica	Cuba	Dominica	Dominican Republic	Ecuador	El Salvador	French Antilles (France)	French Guiana (France)	Grenada	Guatemala	Guyana	Haití	Honduras	Jamaica	Mexico	Montserrat I. (U.K.)	Netherland Antilles (Netherlands)	Nicaragua	Panama	Paraguay	Peru	Puerto Rico (U.S.)	Saint Kitts and Nevis	Saint Lucia	S. Vincent and the Grenadines	Suriname	Trinidad and Tobago	Turks and Caicos Islands (U.K.)	Uruguay	Venezuela	Virgin Islands (U.K.)	Virgin Islands (U.S.)	Brasilia/Washington OPMET Data Banks	SADIS and ISCS Uplink Stations/ Estaciones de Enlace Ascendente ISCS y SADIS
Chiclayo	SPHI			T	T				F	F	T	F	F	T	T			F										T		F		F	F		T								F			F	F
Cuzco	SPZO								F																																		T			F	F
Ilo	*SPLO*																																													*F*	*F*
Iquitos	SPQT									F	T		F																																	F	F
Juanjuí	*SPJI*																																													*F*	*F*
Juliaca	*SPJL*																																													*F*	*F*
Lima-Callao	SPIM			T	T				F	T	T	F	F	T	T			F										T		T		F	F										T			F	F
Pisco	SPSO			T					F	T	T	F	F	T	T			F														F	F										T			F	F
Pucallpa	*SPCL*																																													F	*F*
Puerto Maldonado	*SPTU*																																													*F*	*F*
Tacna	SPTN			T					F			F																																		F	F
Talara	*SPYL*																																													*F*	*F*
Tarapoto	*SPST*																																													*F*	*F*
Tingo María	*SPGM*																																													*F*	*F*
Trujillo	SPRU			T	T				F	T	T	F	F	T	T			F										T		T		F	F										T			F	F
Tumbes	*SPME*																																													*F*	*F*
Yurimaguas	*SPMS*																																													*F*	*F*
…..																																															
URUGUAY																																															
Colonia/Laguna de los Patos Intl.	SUCA			F																													~~F~~													F	F
Maldonado/Carlos Curbelo Intl.	SULS			F						F		F																					F	F												F	F
Montevideo/Angel S. Adami Intl.	SUAA			F						F																																				F	F
Montevideo/Carrasco Intl.	SUMU			F					F	F		F	T		T													T				F	F	F									T			F	F
Rivera/Presidente Gral. Oscar D. Gestido Intl.	SURV																																~~F~~													~~F~~T	~~F~~T
Salto/Nueva Hesperides Intl.	SUSO			F																													~~F~~													F	F
…..																																															

Table MET 3A — Tabla MET 3A

TROPICAL CYCLONE ADVISORY CENTRE
CENTRO DE AVISOS DE CICLONES TROPICALES

EXPLANATION OF THE TABLE

1	Location of the tropical cyclone advisory centre (TCAC).
2	ICAO location indicator of TCAC.
~~2~~3	Area of responsibility for the preparation of advisory information on tropical cyclones by the TCAC in Column 1.
~~3~~4	Period of operation of the TCAC.
~~4~~5	MWO to which the advisory information on tropical cyclones should be sent.
~~5~~6	Location indicator assigned to the MWO in Column 4.

EXPLICACIÓN DE LA TABLA

Columna	
1	Lugar del centro de avisos de ciclones tropicales (TCAC).
2	Indicador de lugar del TCAC
~~2~~3	Zona de responsabilidad para la preparación de la información de asesoramiento sobre ciclones tropicales por el TCAC en la Columna 1.
~~3~~4	Período de operación del TCAC.
~~4~~5	MWO a la que debe enviarse la información de asesoramiento sobre ciclones tropicales.
~~5~~6	Indicador de lugar de la OACI asignado a la MWO de la Columna 4.

Table MET 3A — Tabla MET 3A

Tropical cyclone advisory centre/Centro de avisos de ciclones tropicales	ICAO Loc. Ind / Ind. De Lugar OACI	Area of responsibility/ Zona de responsabilidad	Period of operation/ Período de operación	MWO to which advisory information is to be sent/ MWO a la que debe enviarse información de asesoramiento	
				Name/ Nombre	ICAO Loc. Ind./ Ind. de Lugar OACI
1	2	3	4	5	6
Miami (United States) (Estados Unidos)	KKCI	Tropical Atlantic, Caribbean Sea, Gulf of Mexico Relevant parts of the Pacific East of E148~~8~~0º Atlántico Tropical, Mar del Caribe, Golfo de México Partes pertinentes del Pacífico al este de los 148~~8~~0º E	1 June – 30 November 1 de junio – 30 noviembre	Bogotá Caracas Cayenne Timehri Habana Kingston México Kansas City Panama Port of Spain Port-au-Prince Recife Santo Domingo Tegucigalpa Willemstad Zandery	SKBO SVMI SOCA SYCJ MUHA MKJP MMMX KKCI MPTO TTPP MTPP SBRE~~F~~ MDSD MHTG TNCC SMJP

Table MET 3B — Tableau MET 3B — Tabla MET 3B

~~vaac~~Volcanic ash advisry centre/Centro de aviso de ceniza volcánica		Area of responsibility/ Zona de responsabilidad	ICAO Region/ Zona de la OACI	State/ Estado	MWO to which the information is to be sent/MWO a la que se enviará la información		ACC/FIC to which the information is to be sent/ACC/FIC a la que se enviará la información	
Name/ Nombre	ICAO Loc. Ind. Ind. de Lugar OACI				Name/ Nombre	ICAO Loc. Ind. Ind. de Lugar OACI	Name/ Nombre	ICAO Loc. Ind. Ind. de Lugar OACI
1	2	3	4	5	6	7	8	9
Buenos Aires (Argentina)	SABM	South of S10° between W10° and W90° Al sur de los 10°S entre 10°W y 90°W	SAM	ARGENTINA	Buenos Aires (Aeroparque)	SABE	Ezeiza	SAEF/ SAEU
					Comodoro Rivadavia	SAVC	Comodoro	SAVF/ SAVU
					Córdoba	SACO	Rivadavia	SACF/ SACU
					Mendoza	SAME	Mendoza	SAMF/ SAMV
					Resistencia	SARE	Resistencia	SARR/ SARU
				BOLIVIA	La Paz	SLLP	La Paz	SLLF
				BRAZIL	Amazónica	SBAZ~~SBEG~~	Amazónico	SBAZ
					Brasilia/Cindacta I	SBBS~~SBBR~~	Brasilia	SBBS
					Curitiba/Cindacta II	SBCW~~SBCT~~	Curitiba	SBCW
					Recife/Cindacta III	SBRE~~SBRF~~	Recife	SBRE
					Recife/Cindacta III	SBRE~~SBRF~~	Atlántico	SBAO
				CHILE	Antofagasta	SCFA	Antofagasta	SCFZ
					Puerto Montt	SCTE	Puerto Montt	SCTZ
					Punta Arenas	SCCI	Punta Arenas	SCCZ
					Santiago	SCEL	Santiago	SCEZ
				PARAGUAY	Asunción	SGAS	Asunción	SGFA
				PERU	Lima-Callao	SPIM	Lima	SPIM
				URUGUAY	Montevideo	SUMU	Montevideo	SUEO
Washington (United States)	KNES	North of S10° 140°W Al norte de los 10°S 140°W New York Oceanic* Oakland Oceanic* United States Continental FIRs*	SAM	BRAZIL	~~Amazonico~~Manaus/Cindacta IV	SBEG	Amazonico	SBAZ
					Recife	SBRF	Recife	SBRE
					Recife	SBRF	Atlantico	SBAO
			SAM	COLOMBIA	Santa Fe de Bogotá	SKBO	Barranquilla	SKEC
					Santa Fe de Bogotá	SKBO	Bogotá	SKED
			CAR	CUBA	Habana	MUHA	Habana	MUFH
			CAR	DOMINICAN REPUBLIC	Santo Domingo	MDSD	Santo Domingo	MDCS
			SAM	ECUADOR	Guayaquil	SEGU	Guayaquil	SEGU
			SAM	FRENCH GUIANA (France)	Cayenne	SOCA	Rochambeau	SOOO
			SAM	GUYANA	Timehri	SYCJ	Georgetown	SYGC
			CAR	HAITI	Port-au-Prince	MTPP	Port-au-Prince	MTEG
			CAR	HONDURAS	Tegucigalpa	MHTG	Central American	MHTG
			CAR	JAMAICA	Kingston	MKJP	Kingston	MKJK
			CAR	MEXICO	México	MMMX	Mazatlán	MMZT
					México	MMMX	México	MMEX
			CAR	NETHERLANDS ANTILLES (Netherlands)	Willemstad	TNCC	Curacao	TNCF
			SAM	PANAMA	Panamá	MPTO	Panamá	MPZL
			SAM	PERU	Lima - Callao	SPIM	Lima	SPIM
			SAM	SURINAME	Zandery	SMJP	Paramaribo	SMPM
			CAR	TRINIDAD AND TOBAGO	Port of Spain	TTPP	Piarco	TTZP
			NAM	UNITED STATES	Kansas City	KKCI	Houston Oceanic	KZHU
					Kansas City	KKCI	Miami Oceanic	KZMA
					~~Kansas City~~	~~KKCI~~	~~Nassau~~	~~MYNA~~
					Kansas City	KKCI	San Juan	TJZS
			SAM	VENEZUELA	Caracas	SVMI	Maiquetía	SVZM

Table MET 3C — Tabla MET 3C

Provider State of volcano observatory Estado Proveedor del observatorio de volcanes	Volcano observatory Observatorio de volcanes	VAAC to which the information is to be sent VAAC al cual se debe enviar la información	ACC to which the information is to be sent ACC a la cual se debe enviar la información		MWO to which information is to be sent MWO a la cual se debe enviar la información	
			Name Nombre	ICAO Loc Ind. Ind. de lugar OACI	Name Nombre	ICAO Loc Ind. Ind. De lugar OACI
1	2	3	4	5	6	7
….						
Costa Rica	Observatorio de volcanes y Sismológico de Costa Rica, (OVSICORI-UNA), Heredia ~~Obs. Sismológicao y vulcanológico de Arenal y Miravalles, San José~~	Washington	Central American	MHTG	Tegucigalpa	MHTG
….						
El Salvador	Servicio Nacional de Estudios Territoriales (SNET), Ministerio de Medio Ambiente y Recursos Naturales, (MARN), El Salvador					
….						
Trinidad ~~&~~y T~~a~~obago	Seismic Research Unit, University of Indies St. Augustine	Washington	Piarco	TTZP	Port of Spain	TTPP

Table MET 7 / Tabla MET 7

International Satellite Communication System (ISCS/1) provided by the United States Systeme de communications internationales par satellite (ISCS/1) fourni par les États-Unis Sistema Internacional de comunicaciones por satélite (ISCS/1) proporcionado por Estados Unidos			
State/Territory État/Territoire Estado/Territorio	User of satellite broadcast Utilisateur des diffusions par satellite Usuario de la radiodifusión por satélite	Location of VSAT Emplacement du VSAT Lugar del la VSAT	Equipment operational Équipement pérationnel Equipo operativo
1	2	3	4
… COLOMBIA …	NMS	Headquarters of the Hydrology and Met Institute, Bogotá Bogotá/Eldorado	2w 1W

APPENDIX F

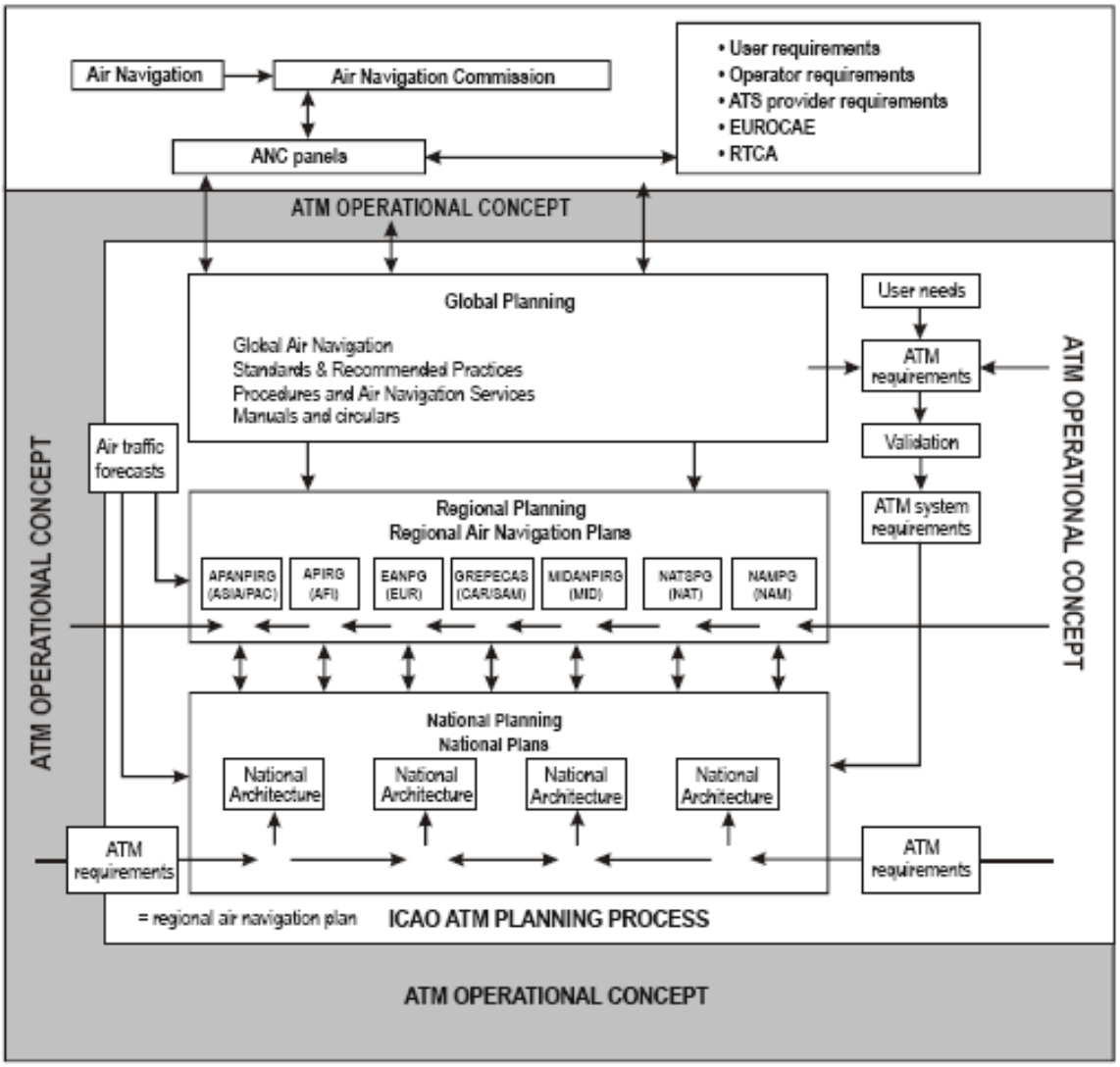

Figure A-1. Framework for achieving a global ATM system