INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Office

Regional Project RLA/06/901

TWENTY FIFTH WORKSHOP/MEETING OF THE SAM IMPLEMENTATION GROUP

(SAM/IG/25)

FINAL REPORT

Virtual Meeting, 2 to 4 November 2020

INDEX

ii-1 PLACE AND DURATION OF THE MEETING

The Twenty-Fifth Workshop/Meeting of the SAM Implementation Group (SAM/IG/25) was held by virtual means (Zoom), Peru, from 2 to 4 November 2020, under the auspices of Regional Project RLA/06/901.

ii-2 OPENING CEREMONY AND OTHER MATTERS

Mr. Oscar Quesada, ICAO South American Office Regional Deputy Director, greeted attending civil aviation authorities and representatives of State and private organizations of the SAM Region. Furthermore, he reiterated his thanks for the continuous support given to the activities of the SAM Regional Office, especially those related to the SAM Implementation Group (SAM/IG).

ii-3 SCHEDULE, ORGANIZATION, WORKING METHODS, OFFICERS AND SECRETARIAT

The Workshop/Meeting agreed to hold its sessions from 08:00 to 13:30 hours, with appropriate breaks.

The sessions of the first and second days were dedicated to the analysis of the activities and deliverables of the GESEA and GT Interop Groups, as well as the current priorities of air navigation. At the third day session, a Plenary meeting was formed to validate and/or endorse the deliverables of the above-mentioned Technical Groups, as well as to approve the conclusions of the Meeting.

Mr. Fernando Hermoza, ATM/SAR Regional Officer and Mr. Francisco Almeida, ICAO Regional Officer CNS, served as the Secretariat, and were assisted by Mr. Roberto Sosa, Regional Officer ANS/SAFETY, Mr. Fabio Salvatierra, Regional Officer of Airfields, as well as Mr. Javier Vittor Administrator of REDDIG.

Likewise, Support was provided by the coordinators and rapporteurs of the GESEA and GT Interop groups and subgroups for the preparation and analysis of documentation.

ii-4 WORKING LANGUAGES

The working languages of the Meeting were English and Spanish.

ii-5 AGENDA

The following agenda was adopted:

Agenda Item 1: ANS context (ATM/CNS) Global and Regional level. Status review of conclusions.

Agenda Item 2: Report of activities of the GESEA and Subgroups

a) Review of air navigation priorities in the ATM field
b) Deliverables and progress of SG1/SG2 working groups
c) Formulation of conclusions
d) Analysis of the 2021 Work Plan

Agenda
Item 3: Report of activities and deliverables of the GT - Interop and Subgroups

a) Review of air navigation priorities in the CNS field
b) Implementation
c) Proposed Conclusions
d) Formulation of the 2021 Work Plan

Agenda
Item 4: SAM/IG Conclusions and Next Actions - Plenary

a) Summary of Sessions
b) Review and approval of Conclusions
c) Approval of the 2021 Work Plan.

Agenda
Item 5: Other Business

ii-6 ATTENDANCE

The virtual Meeting was attended by 131 participants of 13 States of the SAM Region (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela); a State observer from the North American and Caribbean Region (United States), an International Organization (IATA), an Airline (LATAM) and four companies from the aviation industry (AIREON, FREQUENTIS, INDRA and THALES). The list of participants is shown in page iii-1.

ii-7 LIST OF CONCLUSIONS [1]

[1] The Conclusions are presented in the format requested by the Air Navigation Commission (ANC) through Study Note 8993 (6/11/2015) Progress report of the ad hoc working group in the PIRG and RASG reports (item No. 20036).

LISTA DE PARTICIPANTES / LIST OF PARTICIPANTS

ARGENTINA

1. Manuel Alvarez
2. Moria Callegare
3. Sergio Vallone
4. Verónica Villarruel
5. Ana Toloza
6. Andrés Espina
7. Diego Agüero
8. Diego Frigerio
9. Héctor Cancinos
10. Jose Luis Saucedo
11. Laura Zelarayán
12. Mauricio Nogara
13. Walter Silva
14. Débora Kuc
15. Omar Wasilewski
16. Adrián Malizia
17. Claudia Lebán
18. Diego Gamboa
19. Hernán Aguirre
20. Lucas Fernández
21. Maria Reinoso
22. Mónica Pozzuto
23. Paola López
24. Rodrigo Devesa
25. Silvia García

BOLIVIA

26. Jaime Yuri Alvarez
27. Andrea Rubin de Celis
28. Aníbal Castro
29. Luis Rojas
30. Reynaldo Cusi

BRASIL / BRAZIL

31. Clóvis Fernandes Júnior
32. André Santos da Rocha
33. Bruno Ramos
34. Hebert dos Santos
35. José Izidro
36. Wallace Gutemberg
37. Alexandre Alves
38. Lucio Cavalcantes
39. Marcio André Da Silva

CHILE

40. Francisco Uzieda
41. Alfonso De la Vega
42. Christian Vergara
43. Héctor Ibarra
44. Lucio López
45. Patricio Zelada
46. Rodrigo Fajardo

COLOMBIA

47. Rolando Aros
48. Andrés Ruiz
49. Carlos Mayorga
50. Joaquín Penagos
51. Emma Ramírez
52. Fredy Hernán Celis
53. Mauricio Corredor
54. Norbey Rada
55. Harlen Mejía
56. Luis Díaz
57. Luis Peña
58. Medardo Figueroa
59. Oscar García

ECUADOR

60. Christian Ramos
61. Marcelo Valencia
62. Patricio Alvarez
63. Jimmy Sandoval
64. Jorge Zúñiga
65. Luis León
66. Marcelo Valencia
67. Rosaura Reyes

ESTADOS UNIDOS / UNITED STATES

68. Al O´Neill
69. Raúl Chong
70. Will Turner

GUYANA

71. Rickford Samaroo
72. Sewchan Hemchan

PANAMA

73. Gabriel Bernard
74. Agustín Zúñiga
75. Ana Montenegro
76. Carlos Aparicio
77. Daniel de Ávila
78. Lynda González
79. Raymundo Ledezma

PARAGUAY

80. Victor Morán
81. David Torres
82. Eleno Centurión

PERÚ

83. Paulo Vila
84. José Mondragón
85. Brenda Céspedes
86. Christian Núñez
87. Dante Samaniego
88. Diana Montoya
89. Ever Ponte
90. Gabriela López
91. Giuliano Guzmán
92. Joel Cordero
93. John Camacho
94. Johnny Ávila
95. Jorge García
96. Jorge Merino
97. José Díaz
98. Juan Carranza
99. Juan Pablo Portilla
100. Libio Benites
101. Luis Luna
102. Luis Perales
103. Marco Vargas
104. Oscar Saavedra
105. Paul Pillaca
106. Raúl Anastacio Granda

SURINAM / SURINAME

107. Jürgen Cicilson
108. Orlando Köfi
109. Radha Atwaroe
110. Radjan Phalai

URUGUAY

111. Inmer Borba
112. Andrés Barboza
113. Rosanna Barú
114. Andrés Braida
115. Bruno Gómez
116. Gabriel Fernández
117. Henry Díaz

VENEZUELA

118. Jarumy Castillo
119. Maricel Berroterán
120. Orlando Sánchez
121. Sonia Berroterán
122. Wilfredo Gil

AIREON

123. Demetrius Zuidema
124. Athayde Frauche
125. Ana Persiani

FREQUENTIS

126. Guillermo B. Galarza

IATA

127. Julio de Souza Pereira
128. Marco Vidal
129. Raymundo Hurtado (LATAM)

INDRA

130. Raúl Moranchel

THALES

131. Pablo Fernández

OACI / ICAO

132. Fernando Hermoza
133. Francisco Almeida
134. Fabio Salvatierra
135. Roberto Sosa
136. Javier Vittor

Agenda Item 1: ANS Context (ATM/CNS) Global and Regional level. Status Review of Conclusions

1.1 Under this Agenda Item, the following papers were analyzed:

a) WP/1.1 – *Status Review of the Conclusions adopted by SAM/IG Meetings* (presented by the Secretariat)
b) WP/1.2 - *Activities on the implementation of Global Air Navigation Plan sixth edition and formulation of ANP CAR/SAM Vol III* (presented by the Secretariat)
c) IP/1.1 – *Activities related to air navigation services (ANS) in the context of the COVID-19 contingency and the restoration of air operations in the CAR/SAM States* (presented by the Secretariat)

Conclusions and Decisions adopted by SAM/IG meetings

1.2 The Meeting proceeded to review the conclusions and valid decisions, as well as the pending activities of the workshops/meetings of the SAM Implementation Group (SAM/IG), presented updated as **Appendix A** of this Agenda item The list of conclusions and activities includes:

a) the tasks to be carried out and/or the corresponding conclusion in the areas under analysis;
b) the specific tasks that will lead to the fulfillment of the main task;
c) expected results in each task;
d) completion dates;
e) those responsible for its execution;
f) members of support for the task; and
g) the execution status of the same and, when necessary for a better understanding, includes some explanatory comment on the execution status.

1.3 The need and justification to *finalize* Conclusion SAM/IG/14-9 *Database on PBN Capacity of aircraft and operators* was reported. According to the evidence, the situation of PBN implementation and certification of aircraft and operators has evolved a lot since the first stages of the Regional implementation tasks, given the current availability of information on aircraft and operators approved in the CAAs, as well as the scope of surveillance by said authorities over PBN operations. There is also new ICAO documentation that stipulates all the requirements to carry out PBN operations; Flight Plan Format of Doc. 4444, Circular letter 353, Annex 6, etc.

1.4 Due to the above, Conclusion SAM/IG/14-9 *Aircraft and operator PBN capacity database* was finalized, as reflected in **Appendix A.**

1.5 In the same way, the Meeting proceeded to complete the table that appears in **Appendix B** of this Agenda item, which lists the tasks in charge of the States in order to follow up on their implementation.

Activities on the implementation of the sixth edition of the Global Air Navigation Plan and formulation of Vol III of the CAR/SAM ANP

1.6 Taking into account the Decision of CRPP/5 - GREPECAS to prepare Vol. III of the CAR/SAM ANP to be approved by CRPP/6, workshops were planned to be carried out at the end of 2019 to support States in the use of the Vol. III template, which was being developed by headquarters.

1.7 In view of the pandemic, the planning was reformulated and it was agreed to hold 4 virtual workshops for the States of the SAM Region, which were carried out with the following schedule:

- Colombia, Brazil, Chile, 10 to 11 August, 2020.
- Argentina, Bolivia, Ecuador, Peru, Venezuela, 17 to 18 August, 2020.
- Panama, Paraguay and Uruguay, 24 to 16 August, 2020.
- Guyana and Suriname, 15 to 17 September, 2020.

1.8 During the Workshops, important feedback was obtained on the organization, understanding and filling of the Vol. III of the ANP CAR SAM template, and the domain of the participants regarding the methodology of the six steps of Doc. 9883 and of the use of the GANP/6, could be expanded, understanding this as a "toolbox" available on the web.

1.9 However, it was observed that the attendance to the SAMIG workshops ATM and CNS specialists, representing their states, was minority, which was noted by the Meeting.

1.10 As a next step, tentatively for the end of November 2020, a Workshop will be held in the SAM Region on the use of the Air Navigation System Performance Assessment Tool (AN-SPA), which allows to guide the user in the application of the six-step method at the local level and works considering the ASBU modules and their relationship with the key performance indicators (KPI) contained in the KPI Catalog of the GANP Portal.

1.11 The Regional Offices of Mexico and Lima have been coordinating the activities of the year 2021 regarding the preparation of Vol III ANP, estimating that these tasks require the strong participation of air navigation specialists from the CAR and SAM States.

1.12 In turn, Colombia informed the Meeting about the availability of the ICAO GATS AD3M (Aviation data driven decision making) distance course. It was estimated that this course can help to train the staff who will be responsible for data governance and meta-data management that will help manage the KPI indicators of Vol III ANP-CAR/SAM based on GANP/6, in addition to their National Air Navigation Plans. The Secretariat was in charge of coordinating the feasibility of supplying this course to the RLA/06/901 member States in 2021.

Activities related to air navigation services (ANS) in the context of the COVID-19 contingency and the reestablishment of air operations in the CAR/SAM States

1.13 It was reported that the first Virtual Meeting of Directors General of Civil Aviation (RVDGAC) of the SAM Region concluded that a strategic working group was established on the guidelines for a regional recovery strategy, which included the collaborative effort between States, industry, regional organizations, SRVSOP, in close coordination with CAPSCA and other international organizations.

1.14 These and other activities were carried out in conjunction with representatives of the Strategic Group and the results of the same are available on the following website:

https://www.icao.int/SAM/SECURITY-FACILITATION/COVID-19/Pages/COVID19-SFProjects.aspx

1.15 As part of the SAM Strategic Plan against COVID-19, several of the regional activities were aligned to support the adoption of the CART Recommendations and the Public Health Measures included in the document *El Despegue*, annexed to the CART. This allowed that in the SAM Region 100%

of the States to report the adoption of the CART measures, achieving a very close alignment of the SAM Strategic Plan with the CART recommendations and the measures of the annexed document *El Despegue*.

1.16 With regard to public health risk measures, work has been done through the SRVSOP on the development of a regional health protocol that is 100% aligned with the document *El Despegue* (Take-off document), harmonization in the adoption of public health risk measures has allowed the restart of international and domestic air transport in 85% of the States of the South American Region in October.

Information presented

1.17 IATA presented information prepared by the Chief Economist of the Organization reflecting the impact that the global COVID-19 scenario has been producing on airlines, showing the cost components, and urging that these can be reduced through the efficiency of services , in order to promote the rapid recovery of the industry. The IATA presentation can be found on the Meeting website.

APPENDIX A

STATUS OF IMPLEMENTATION OF CONCLUSIONS AND/OR TASKS EMANATING FROM SAM/IG MEETINGS
(Updated SAM/IG/25, November 2020)

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
1. Implementation of performance-based navigation (PBN) in the SAM Region							
1-1	**Conclusion SAM/IG/14-6: Projects and/or action plans for PBN redesign of the main South American TMAs** That SAM States: a) send the Project and/or Action Plans for PBN redesign of the main TMA(s) selected by their Administration, in order to complete the SAM PBN Project that is contained in Appendix J to this part of the Report, to the SAM Regional Office by 31 December 2014; b) send the corresponding updates to the aforementioned Project and/or Plans to the SAM Regional Office as soon as possible, so as to ensure harmonisation of activities under the SAM PBN Project.	Determination of the selected air spaces to be optimized with the implementation of PBN	Indicate the selected airspace for redesign or optimisation Report updates	SAMI/IG/25	STATES	RO/ATM	**VALID** NOTE: SAM/IG/24 considered to transfer the activities of this conclusion to GESEA. It is deemed necessary to develop SAM Airspace Concept. SAMIG25; Argentina reports in progress
1-2	**Conclusion SAM/IG/21-01: Objectives of PBN implementation harmonized at regional and interregional level** That SAM States, organisations, users, and stakeholders double efforts to meet regional and interregional performance-based air navigation implementation goals, based on GREPECAS projects, and contemplating the strengthening of national PBN implementation plans so that they include performance indicators and the use of recognised project management tools and methods.	Updating of regional PBN action plans and State action plans. Follow-up to PBN implementation and specific assistance to States.	PBN implementation plans implemented	SAMI/IG/26	STATES	RO/ATM	**VALID** NOTE: SAM/IG/24 considered to transfer the activities of this conclusion to GESEA. It is deemed necessary to develop SAM Airspace Concept. SAMIG25; Argentina reports in progress

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
1-3	**Conclusion SAM/IG/25-04 Adoption of the Regional guide on the implementation of PBN visual runway procedures** SAM States adopt the Regional guide on the implementation of PBN visual runway procedures developed by GESEA and, on this basis, approve national regulations on the implementation of these procedures.	Adopt the Regional Guidance on PBN procedures for visual runway implementation	Deliver the national regulation on implementation of PBN procedures for visual runway	As soon as possible	STATES	RO/ATM	**NEW FROM SAMIG/25**
1-4	**Conclusion SAM/IG/25-05 Studies on RNAV visual flight procedures - RVFP** The GESEA SG2 conduct studies on the implementation of RNAV visual flight procedures (RVFP), in order to have available a harmonised regional guide aligned with ICAO provisions	Deliver studies	Studies on RNAV Visual flight procedures - RVFP	No later than October 2022	GESEA	RO/ATM	**NEW FROM SAMIG/25**
2. Contingency plans and air space efficiency							

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
2-1	**Conclusion SAM/IG/23-04: Procedure to be applied in case of radioactive clouds or accidental release of radioactive material** That the civil aviation authority and/or ATS authorities, in coordination with meteorological authorities and/or meteorological watch offices, implement procedures related to the production of SIGMETs in order to: a) Ensure that their ATS/MET cooperation agreements include the exchange of information on radioactive material in messages exchanged between ATS and MET units; b) Foresee training for ATS staff on procedures related to receiving information from the London VAAC concerning radioactive material; c) Coordinate the inclusion of the accidental release of radioactive material or the presence of radioactive clouds in their contingency plans.	Develop and sign ATS MET cooperation agreements, including information related to radioactive material in exchange messages	ATS MET cooperation agreements signed.	SAM/IG/26	States	RO/ATM RO/MET	**VALID** SAMIG/25: Chile has implemented Information comes from VAAC Buenos Aires. Bolivia has implemented, see IP 5.1 Argentina; Implemented.
2-2	**Conclusion SAM/IG/21-02: Consolidation of the implementation of 40NM longitudinal separation minima between adjacent FIRs in the SAM Region and promotion of the Action Plan for the implementation of a 20NM separation** That SAM States take action and apply procedures in the ACCs to consolidate the implementation of 40NM longitudinal separation minima and give priority to the execution of the action plan for the implementation of standard 20NM separation minima between adjacent FIRs in SAM continental airspace.	Follow-up to the implementation of the 40NM separation, follow-up to the Action Plan for the implementation of 40 NM separation, follow-up to the Action Plan for the implementation of 20NM minima, and specific assistance to States.	Implementation of 20NM longitudinal separation minima in continental airspace.	SAM/IG/25	STATES	RO/ATM	**VALID** NOTE: SAM/IG/24 considered to transfer the activities of this conclusion to GESEA. It is deemed necessary to develop SAM Airspace Concept. *NOTE.- The conclusion was relocated as part of Item 2, airspace efficiency* SAMIG/25 Argentina reports in progress

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
2-3	**CONCLUSION SAM/IG/25-01 Implementation of strategic direct routing - EDE** SAM States analyse the guidance material prepared by the GESEA SG1 on the strategic direct routing (EDE) concept, which has been made available to the administrations, and coordinate with IATA and international airlines, as well as with adjacent States, for its implementation.	Follow up EDE implementation Fuel savings analysis, supported by airlines.	Delivery of AIC and/or SUP AIP by the states, on EDE	As soon as possible	States Airlines IATA	RO/ATM GESEA	**NEW FROM SAMIG/25**
2-4	**CONCLUSION SAM/IG/25-02 Adoption of the guidelines of the SAM ATS contingency framework plan (MCATS/SAM) and alignment of national plans** States adopt the guidelines of the SAM ATS Contingency Framework Plan developed by GESEA and start harmonising their national ATS contingency plans, so that the documentation required for regional activities on contingency plans and letters of ATS agreement, tentatively scheduled for 2021, may be available on a timely manner.	Follow up ATS contingency planning harmonization	Delivery of National ATS Contingency Plans harmonized to MCATS	No later than 15 April 2021	States Airlines IATA	RO/ATM GESEA	**NEW FROM SAMIG/25**
2-5	**CONCLUSION SAM/IG/25-03 Activities for the development of the SAM ATM/CNS contingency framework** States support GESEA activities towards a second stage of the MCATS, with a view to developing guidance material for a "SAM ATM/CNS Contingency Framework Plan".	Prepare document for a harmonized implementation of ATM/CNS National Contingency Plans, with interfaces to AIM, MET, Airports, etc. services duly in line with neighbouring States, even if applicable, with CAR states.	ATM/CNS contingency Plan Framework Plan for SAM	No later than October 2023	GESEA	RO/ATM	**NEW FROM SAMIG/25**

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
			3. **Standards and procedures for performance-based navigation operations approval**				
~~3-1~~	~~**Conclusion SAM/IG/14-9: Aircraft and operator PBN capacity database**~~ ~~That the ICAO SAM Office send to SAM States information on the use of the aircraft and operator PBN capacity database, requesting that the aforementioned database be completed by 15 March 2015.~~	~~Complete the implementation of the Database on aircraft and operator PBN capacity; and circulate a letter to States requesting to complete the data.~~	~~a) Web-based application~~ ~~b) Updated database~~	~~SAM/IG/24~~	~~RO/TC~~	~~RO/ FLS~~	~~**VALID**~~ ~~Application development started.~~ ~~Currently under review by ICAO Montreal HQ in order to include it in iSTARS.~~ **FINALIZED** Note. – SAMIG/ 25 was informed by the Secretary via NE/1.1 on the status of the request. The Meeting agreed to end the Conclusion, in accordance with the reasoning set out. It was highlighted that CARSAMMA did not stop maintaining the database linked to aircraft RVSM capabilities and their monitoring functions
			4. ATFM implementation				
4-1	**Conclusion SAM/IG/24-01:** ATFM services implemented in the SAM States provide for the development of the Daily Plan - PDA and coordinated the means and procedures for distribution or publication in repositories or websites on a regular basis, designating its focal points responsible for implementing this initiative. In addition, an agile procedure for developing ATFM Regional Teleconferences is studied and defined, with the goal of progressively achieving a daily periodicity.	Develop PDA, coordinating its dissemination with SAM regional ATFM dependencies and CAR if applicable. Sign or update ATFM agreement letters to formalize the exchange and its processes. Study media for ATFM teleconferences	PDA exchanged between SAM region dependencies and CAR if applicable	SAM/IG/ 26	States / ATFM Focal Points	RO/ATM	**VALID** SAMIG/25, Chile executing in progress. Argentina has implemented.

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
4-2	**Conclusion SAM/IG/23-01: Implementation of ATFM measures in accordance with Doc 9971, and coordination in case of ATS contingencies** **That,** SAM States prioritise the provision of the following for their ATS and ATFM services: a) Strengthen the functions of the flow management positions (FMPs) or units (FMUs), providing them with the prerogatives for coordinating and supporting ATS services; b) Define the profile and skills of the ATFM staff, and provide programmes for initial and recurrent training for the Staff; c) Mandate that ATFM measures are strictly based on the Doc. 9971 to face situations generating capacity/demand imbalance, especially in cases of ATS capacity degradation caused by unforeseen events; d) Establish instructions and supervision H24, ensuring that ATFM measures has the less impact for international flights, and all ATFM measures are agreed with adjacent ATFM or ACC dependencies; e) Mandate the correct application of the ATFM process, from the ATM planning phase to the phase of operations analysis and performance control; and f) Exclude the use of NOTAM of Flow Control to deal with situations of demand/capacity unbalance, with the only exception of the initial response that an ACC may require in the first 12 hours of ATS contingency.	To meet the provisions of ICAO Doc 9971 and the SARPs contained in Annex 11	Support to ATFM and ATC	SAM/IG/25	States	RO/ATM	**VALID** SAMIG/25, Argentina executing in progress. Chile, executing in progress. Coming soon, publication of National ATFM manual. Chile has excluded the use of Flow Control NOTAM, indicated in item f)
5. Operational implementation of new ATM automated systems and integration of the existing systems							
~~5-3~~	~~**Conclusion SAM/IG/19-2: Implementation of procedures to mitigate the duplication/ multiplicity of scheduled commercial flight plans**~~ ~~In order to implement procedures to mitigate the duplication/multiplicity of scheduled commercial~~	~~a) establish AFTN address XXXXZPZX as the only address for receiving flight plans~~ ~~b) develop AIC~~	~~Singe address Implemented~~ ~~AIC developed~~	~~SAM/IG/26~~	~~States~~	~~RO/CNS y RO/ATM~~	~~**VALID**~~ ~~To date, Uruguay and Peru have implemented the procedure. Brazil, Ecuador and Venezuela have begun the procedure~~

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
	~~flight plans, States:~~ ~~a) should establish AFTN address XXXXZPZX, corresponding to the ARO/AIS Offices, as the only address for receiving flight plans.~~ ~~b) could use as a reference the AIC model developed by Peru, shown in Appendix G to this agenda item, when filing the flight plan directly to the ACC FDP.~~						**SUPERSEDED** **It was superseded by conclusion SAM/IG/25-06**
5-1	**Conclusion SAM/IG/25-06 Approval of the ATM/FPL Roadmap and of the format for acknowledgment (ACK) and rejection (REJ) of flight plans and associated messages** That States: a) Approve the ATM/FPL Roadmap and the format for acknowledgment (ACK) and rejection (REJ) of flight plans and associated messages; and b) Adopt the guidelines and procedures of the ATM/FPL Roadmap.	Adoption of the ATM/FPL roadmap by states	- Roadmap implemented - Mitigate the occurrence of errors and duplication /multiplicity of flight plans, also providing feedback to the originators of FPLs and associated messages.	SAMIG/27	States	RO/CNS RO/ATM GT Interop	**NEW FROM SAMIG/25** Replaced Conclusion SAM/IG/19-2

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
5-2	**Conclusion SAM/IG/21-03: Activities required in the AIDC pre-operational phase to reduce migration times to the operational phase** That SAM States currently in the AIDC pre operational phase, in order to reduce time in this phase and migrate to the operational phase: a) operate AIDC for a period of time to obtain the skills required for use thereof; b) monitor AIDC operation, recording errors made during the reporting, coordination and transfer stages; c) conduct statistical measurements based on the results of b), in order to identify the most frequent errors; d) based on the results of c), take the necessary action to mitigate errors; and **e)** report the results obtained in c) and d) and disseminate the lessons learned at events, teleconferences and AIDC implementation meetings of the SAM Region, so that they may serve as a reference for other AIDC implementations.	Follow-up and coordination via teleconferences and meetings	AIDC operational connection completed	December 2019	States	RO/CNS and RO/ATM	**VALID** On 18 August 2018, operational AIDC was established between Lima ACC - Guayaquil ACC and also between Iquique ACC–Lima ACC SAMIG/25, Chile has implemented. Argentina executing in progress.
5-3	**Conclusion SAM/IG/23-03: Adaptation of AMHS terminals of aeronautical meteorology users** That, pursuant to the standard requiring the implementation of the exchange of OPMET messages in IWXXM GML format by 5 November, States should: a. Adjust AMHS terminals of aeronautical meteorology users so that they may transmit and receive OPMET messages in IWXXM GML format b. Implement the necessary AMHS interconnections in order to facilitate the transmission and reception of OPMET messages in IWXXM GML format **c.** States in a position to do so should conduct OPMET message exchange trials in IWXXM GML format	To meet the provisions of amendment 78 to ICAO Annex 3	Perform the tests and submit results	SAM/IG/26	SAM Region States	ICAO SAM Office	**VALID** SAMIG/25 Argentina executing in progress.

No.	Task to be developed	Specific tasks	Deliverables	Completion date	Responsible party	Members supporting the task	Status of implementation
5-4	**Conclusion SAM/IG/25-07 Implementation of Space-based ADS-B under a regional technical cooperation project** That the Secretariat: a) Consult Trinidad and Tobago on their interest in participating in a potential regional implementation of Space-based ADS-B, together with Chile and Panama, initially; b) Initiate the procedures, together with the Technical Cooperation Bureau (TCB), to enable the contracting of the service through Regional Project RLA/03/901; and c) Organise an ad-hoc group under Regional Project RLA/03/901, with those States interested in participating in the regional implementation of Space-based ADS-B, for the drafting of the necessary documents for a potential contracting of the service.	Provide States that expressed interest in the implementation of ADS-B Satellite support necessary for the procurement of the service.	Support concerned states and coordination with TCB ICAO	No later than SAMIG/26	RO/CNS	Panama, Chile, Trinidad and Tobago and other interested states.	**NEW FROM SAMIG/25**

Updated FH November 2020

APPENDIX B

FOLLOW-UP TO THE CONCLUSIONS AND PENDING TASKS OF SAM/IG MEETINGS
(Updated SAM/IG/25 – November 2020)

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Conclusion SAM/IG/13-9 - IATA safety event indicators for SAM States Encourage States to develop, jointly with operators, Secretariat and other ATM community stakeholders deemed relevant, the methodology allowing the use of the data on safety events and indicators registered by airlines through IATA, in order to identify and mitigate any potential risk to operations, setting goals, priority areas and action plan.	YES	O/G	YES	YES		YES	YES		NO	NO	O/G	NO	O/G	YES	Bolivia: First contact made with IATA SAM/IG/23. IATA provided data with FDX tool. Person in contact is Mr. Julio Pereira. From this meeting Colombia will contact M. Pereira to access the information on safety events and indicators registered by airlines trough IATA. Paraguay expressed interest. Guyana will contact Mr. Pereira for information. Peru: teleconference will be schedule with IATA to get information.
Conclusion SAM IG/14-18 - Exception in the insertion of alternate aerodromes That: a) Airlines operating to the United States that will apply exceptions to the insertion of the alternate aerodrome, insert "ZZZZ" in box 16 of the FPL and specify ALTN//NIL in box18. **b)** States include such procedures in the respective AIPs.	b) YES	b) NO	YES	b)NO	b)O/G	b)O/G	b)O/G	b)O/G	b)N/A	b)O/G	b) YES	b)O/G	b)O/G	b)NO	The recommendation of the NAM/CAR/SAM AIDC/4 meeting of April 2018 also promotes the implementation of the exception. SRVSOP LAR 121.2585 and ICAO Annex 6 provide for the exception when filling the ALTN DEST Bolivia will not apply LAR 121.2585.

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
															ICAO will be notified through correct channels. Argentina is publishing the application in its AIP, as reported at the SAMIG/21. SAM/IG/23 informed; Panama does not apply the procedure. SAMIG/25 Argentina has implemented.
Conclusion SAM/IG/16-01: Model amendment to the letter of operational agreement on AIDC between two centres That SAM States, when implementing AIDC between adjacent ATS units, make the corresponding amendments to the letters of operational agreement using as a model the amendment to the letter of operational agreement between the Lima ACC and the Guayaquil ACC for the operation of AIDC, shown in Appendix A to this agenda item.	O/G	N/A	O/G	O/G	YES	YES	O/G	O/G	YES	O/G	YES	N/A	O/G	O/G	At present, the model amendment to the letter of operational agreement on AIDC is being used by Colombia, Ecuador, Panama and Peru. The remaining States will use it when their operational letters of agreement are amended to include AIDC. Panama and Colombia are making arrangements to sing an agreement. Guyana has capability and has started arrangements with Piarco and proposes begin conversation with Brazil.
Conclusion SAM/IG/18-01: PANS-OPS recommendations for harmonising instrument procedures in the SAM Region That SAM States implement and apply, as soon as possible, the recommendations of the PANS-OPS group, shown in Appendix B* to this part of the report, with a view to harmonising instrument procedures and the	O/G	O/G	O/G	O/G		YES			O/G	YES	YES		O/G	YES	*See information in PANS-OPS workshop States to report on implementation of conclusions at SAM/IG/19 The objectives of the conclusion are being met.

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
associated processes, and enhance safety.															Follow-up being conducted in SAM/IG/19 table. Table was updated at SAMIG/21. Colombia proposes the conclusion be assumed by tasks of GESEA SG2. Send conclusion to GESEA for asses feasibility of migrating task to GESEA PTA.
~~**Conclusion SAMIG/19-02: Implementation of procedures to mitigate duplication/multiplicity of scheduled commercial flight plans**~~ ~~In order to implement procedures to mitigate the duplication/multiplicity of scheduled commercial flight plans, States:~~ ~~a) should establish AFTN address XXXXZPZX, corresponding to ARO/AIS Offices, as the only address for receiving flight plans.~~ ~~b) could use as a reference the AIC model developed by Peru, shown in Appendix G to this agenda item, when filing the flight plan directly to the ACC FDP.~~	~~a) O/G~~ ~~b) O/G~~	~~NO~~	~~a) O/G~~ ~~b) O/G~~	~~a) YES~~ ~~b) YES~~	~~a) O/G~~ ~~b) O/G~~	~~a)YES~~ ~~b) O/G~~	~~NO~~	~~a) O/G~~ ~~b) O/G~~	~~a) YES~~ ~~b) O/G~~	~~a) O/G~~ ~~b) O/G~~	~~a) YES~~ ~~b) YES~~	~~NO~~	~~a) O/G~~ ~~b) NO~~	~~a)YES~~ ~~b) O/G~~	~~SAMIG/23 informed:~~ ~~Panama has stablished a single address, and is deploying trials with COPA.~~ ~~Ecuador delegates responsibility of FLP presentation to air operators.~~ ~~Venezuela is working with the single address SVMIZPZX~~ ~~Bolivia is under the automation process and do not generate duplicity/multiplicity of flight plans~~ ~~Guyana está analizando la capacidad de su sistema ATM automatizado.~~ **SUPERSEDED** **It was replaced by Conclusion SAM/IG/25-06. See below.**

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Conclusion SAM/IG/21-01: Regional and interregional harmonised PBN implementation goals That SAM States, organisations, users, and stakeholders double efforts to meet regional and interregional performance-based air navigation implementation goals, based on GREPECAS projects, and contemplating the strengthening of national PBN implementation plans so that they include performance indicators and the use of recognised project management tools and methods.	O/G	O/G	O/G	YES		O/G		O/G	O/G	YES	O/G		O/G	YES	Bolivia: implementation foreseen by June 2020 Peru: In 2018 eight (8) key performance indicators (KPI)has been implemented and applied to ATFM and A-CDM. It is foreseen to extend those indicators to PBN in 2019. Venezuela inserted indicators Send conclusion to GESEA for asses feasibility of migrating task to GESEA' PTA.
Conclusion SAM/IG/21-02: Consolidation of the implementation of 40nm longitudinal separation minima between adjacent FIRs in the SAM Region and promotion of the action plan for the implementation of a 20NM separation That SAM States take action and apply procedures in the ACCs to consolidate the implementation of 40NM longitudinal separation minima and give priority to the execution of the action plan for the implementation of standard 20NM separation minima between adjacent FIRs in SAM continental airspace.	O/G	YES		O/G		YES		YES	YES	YES	O/G		YES	YES	Bolivia cannot implement 20nm separation minima with its current communications system. Improvement to the VHF network foreseen for 2019. Brazil: has implemented CNS requirements that allow 20NM to be applied with adjacent continental FIRs. However, it is not possible to apply 20NM in all cases because there are adyacent States that do not accept transfer with 20 NM. Peru: For operational restrictions of the Amazon ACC with other adjacent ACC it is not possible to apply 20 NM. Date of

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
															implementation subject to confirmation from Brazil. Tests with Ecuador at VAKUD point of 20 NM proposed for second half 2020 Ecuador will fix date on ATSRO/10 meeting, for testing with Peru in VAKUD 20NM Colombia: during ATSRO/10 meeting (Bogota) will analyse the implementation of 20NM separation. Guyana has implemented 40 NM with all its adjacent ACC and proposes coordination to implement 20 NM.

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Conclusion SAM/IG/21-03: **Activities required in the AIDC pre-operational phase to reduce migration times to the operational phase** That SAM States currently in the pre-operational phase of AIDC, in order to reduce time in this phase and migrate to the operational phase: a) operate AIDC for a period of time to obtain the skills required for the use thereof; b) monitor AIDC operation, recording errors made during the reporting, coordination and transfer stages; c) conduct statistical measurements based on the results of b), in order to identify the most frequent errors; d) based on the results of c), take the necessary action to mitigate errors; and **e)** report the results obtained in c) and d) and disseminate the lessons learned at events, teleconferences and AIDC implementation meetings of the SAM Region, so that they may serve as a reference for other AIDC implementations.	N/A	N/A	 O/G O/G O/G O/G	 YES YES YES O/G	 O/G O/G O/G O/G	 YES YES YES O/G O/G	N/A	 O/G O/G O/G O/G	 YES YES YES O/G	O/G	 YES YES YES O/G	N/A	N/A	O/G	Brazil, Chile, Colombia, Ecuador, Panama and Peru have activities to sign operational letters of agreement SAM/IG/23: Venezuela has foreseen tests for August or September 2019 and for October 2019 to subscribe an agreement at least with Colombia Guyana will begin tests between local ATS and will propose tests with Brazil.

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Conclusion SAM/IG/23-04: Procedure to be applied in case of radioactive clouds or accidental release of radioactive material That the civil aviation authority and/or ATS authorities, in coordination with meteorological authorities and/or meteorological watch offices, implement procedures related to the production of SIGMETs in order to: a) Ensure that their ATS/MET cooperation agreements include the exchange of information on radioactive material in messages exchanged between ATS and MET units; b) Foresee training for ATS staff on procedures related to receiving information from the London VAAC concerning radioactive material; Coordinate the inclusion of the accidental release of radioactive material or the presence of radioactive clouds in their contingency plans.	YES	YES		YES											SAMIG/25: Chile has implemented Information comes from VAAC Buenos Aires. Bolivia has implemented, see IP 5.1 Argentina; Implemented.
Conclusion SAM/IG/25-01 Implementation of strategic direct routing - EDE SAM States analyse the guidance material prepared by the GESEA SG1 on the strategic direct routing (EDE) concept, which has been made available to the administrations, and coordinate with IATA and international airlines, as well as with adjacent States, for its implementation.															**NEW FROM SAMIG/25**

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Conclusion SAM/IG/25-02 Adoption of the guidelines of the SAM ATS contingency framework plan (MCATS/SAM) and alignment of national plans States adopt the guidelines of the SAM ATS Contingency Framework Plan developed by GESEA and start harmonising their national ATS contingency plans, so that the documentation required for regional activities on contingency plans and letters of ATS agreement, tentatively scheduled for 2021, may be available on a timely manner.															**NEW FROM SAMIG/25**
Conclusion SAM/IG/25-04 Adoption of the Regional guide on the implementation of PBN visual runway procedures SAM States adopt the Regional guide on the implementation of PBN visual runway procedures developed by GESEA and, on this basis, approve national regulations on the implementation of these procedures.															**NEW FROM SAMIG/25**

Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	REMARKS
Conclusion SAM/IG/25-06 Approval of the ATM/FPL Roadmap and of the format for acknowledgment (ACK) and rejection (REJ) of flight plans and associated messages That States: a) Approve the ATM/FPL Roadmap and the format for acknowledgment (ACK) and rejection (REJ) of flight plans and associated messages; and b) Adopt the guidelines and procedures of the ATM/FPL Roadmap.															**NEW FROM SAMIG/25** Replaced Conclusion SAM/IG/19-2

FH Updated Nov 2020

Agenda Item 2: Report on activities of GESEA and its Subgroups

a) Review of air navigation priorities in the ATM field
b) Deliverables and progress made by SG1/SG2 working groups
c) Formulation of conclusions
d) Analysis of the 2021 work plan

2.1 Under this agenda item, the following papers were discussed:

a) WP/2.1 – *Harmonised implementation of strategic direct routing (EDE)* (presented by GESEA)
b) WP/2.2 – *ATS contingency framework plan for the SAM Region (MCATS)* (presented by GESEA)
c) WP/2.3 – *Regional guide on the implementation of PBN visual runway procedures* (presented by GESEA)
d) IP/2.1 – *Tasks on the operational concept for the efficiency and capacity of airspace* (presented by the Secretariat)
e) IP/2.2 –*GESEA activities update by the Uruguayan State* (presented by Uruguay)
f) IP/2.3 – *Implementation of PBN flight procedures in Ecuador* (presented by Ecuador)
g) IP/2.4 – *PBN in Argentina – Progress* (presented by Argentina)
h) IP/2.5 – *Development and design of RNAV/RNP instrument flight procedures in collaboration with the industry* (presented by Bolivia)
i) IP/2.6 – *Implementation of direct routing (EDE) in the SKED and SKEC FIRs within Colombian airspace* - (presented by Colombia)

Harmonised implementation of strategic direct routing (EDE)

2.2 The GESEA SG1 reported on the progress made in the implementation of strategic direct routing (EDE). It was noted that the studies conducted by the task force had been circulated among the States in both languages. No comments were received on the deliverable, shown in **Appendix A** to this part of the report. It was noted that the GESEA SG1 had recommended implementation starting on 5 November 2020, if feasible for the administrations.

2.3 The Meeting noted that Chile and Colombia had recently issued their AICs on EDE implementation in their airspace, and that other States, such as Guyana and Venezuela, had already issued their aeronautical publications and/or were applying EDE early on. Uruguay also informed about its participation in the activities of the task force, but acknowledged that EDE was not providing any advantages in the Montevideo FIR due to the characteristics of that airspace.

2.4 Peru and LATAM informed the Meeting about tests carried out in October with a real flight operating between Lima - Miami, which had shown the feasibility of processing flight plans in CORPAC's INDRA system, without affecting ATS prediction and automation tools. LATAM was still processing fuel savings results, and would share them in due course.

2.5 IATA acknowledged the support of SAM States and ANSPs, and mentioned that these initiatives were also being implemented in the neighbouring CAR Region. It was noted that comprehensive regional and inter-regional implementation was required for the flight plan to operate "seamlessly" and

without modifications, as filed at the departure airport. The aim was to move towards early implementation of the GANP/6 FRTO element.

2.6 In view of the above, draft conclusion SAM/IG/25-01 *Implementation of strategic direct routing (EDE)* was formulated and adopted by the plenary, as set out in the report on agenda item 4.

ATS contingency framework plan for the SAM Region (MCATS /SAM)

2.7 The "ATS contingency framework plan for the SAM Region", shown in **Appendix B** to this part of the report, was presented. This study had already been circulated among States/territories in both languages. No objections to the framework plan were raised.

2.8 In this regard, it was recognised that the Plan met the main objectives set out by the GESEA SG1 and that activities were required in each State for its alignment with national ATS contingency plans as soon as possible, in order to:

a) provide a contingency response framework based on which SAM States could ensure the controlled continuation of aircraft operations in the UIRs/FIRs affected by contingencies, including the flow between FIRs not involved therein;
b) ensure timely, harmonised, and appropriate response to all events which could result in the disruption of ATS, or in which the ATS is involved, thus disrupting the normal movement of aircraft;
c) provide a higher level of certainty to airspace users and aerodromes during contingency operations; and
d) facilitate the harmonisation of plans between States/territories/organisations located in the common boundary between the CAR/SAM Regions.

2.9 During its work, the Task Force on Contingency Plans noted that, in order to strengthen regional resilience, it was advisable for each State to have in place ATM/CNS contingency plans, integrating the response plans of all services, including ATFM, thus including MET, AIM, etc.

2.10 It was noted that two face-to-face meetings on ATS contingency plans (scheduled for 2020 but postponed due to the pandemic) were still pending. GESEA tentatively proposed May and June 2021 for holding the SAM SOUTH and SAM NORTH meetings, which required that all fourteen States/territories develop and agree on the documentation through electronic means and teleconferences.

2.11 Argentina informed that, based on elements of the MCATS, arrangements were being made to reflect ATS contingency plan requirements in an appendix to RAAC Part 211. Uruguay and other States took note of this initiative and requested that a copy of the project be sent to them by mail, as a reference.

2.12 Uruguay requested coordination actions with SRVSOP, in order to link and harmonize MCATS with the provisions of LAR 211 on ATS Contingency. The Meeting requested support from Secretariat to carry out the appropriate coordination and necessary actions.

2.13 In view of the above, the Meeting formulated draft conclusion SAM/IG/25-02, *Adoption of guidelines of the SAM ATS contingency framework plan* (MCATS/SAM) *and alignment of national plans*, and draft conclusion SAM/IG/25-03, *Activities for the formulation of the SAM ATM/CNS contingency framework plan*, which were adopted by the plenary.

Regional guide on the implementation of PBN visual runway procedures

2.14 The GESEA SG2 noted that the use of PBN in the design of instrument approach procedures (IAPs) provided greater flexibility to airspace planners/designers for an efficient use of airspace and facilitated airport access through the improvement of operational minima, which enhanced air connectivity that, in turn, fostered socio-economic development.

2.15 PBN procedures support stabilised approaches and prescribe initial-intermediate-final approach segments duly protected from obstacles, and contribute to safety as they help reduce controlled flight into terrain/loss of control in-flight (CFIT/ LOC-I) events.

2.16 **Appendix C** to this part of the report contains the deliverable "Regional Guide on the Implementation of PBN visual runway procedures", which gives ample details for PANS OPS designers and authorities concerned.

2.17 The Meeting welcomed the implementation of PBN visual runway procedures, and agreed that the guide was most appropriate for a first stage involving only PBN approaches with minima of not less than 500 ft / 3000 metres.

2.18 In this regard, it was recommended that SAM States adopt the aforementioned guide (customized as needed), so as to generate national regulations on the implementation of PBN visual runway procedures.

2.19 The second stage proposed by GESEA was the study of the RVFP (RNAV visual flight procedures) concept.

2.20 In view of the above, draft conclusion SAM/IG/25-04, *Adoption of the Regional guide on the implementation of PBN visual runway procedures*, as well as draft conclusion SAM/IG/25-05, *Studies on RNAV visual flight procedures*, were formulated and approved by the Plenary.

SAM airspace efficiency and capacity concept of operations (CONOPS)

2.21 The Meeting was informed that, as part of the GESEA SG1 2020 work plan, the SAM airspace concept of operations document (now PBN CONOPS) had been updated. A new CONOPS approach was proposed to enhance the previous document, based on the implementation of PBN and navigation specifications.

2.22 The CONOPS TF held five virtual meetings. However, it encountered difficulties when performing its work since several members were simultaneously included in the task forces of the two subgroups, which had conflicting meeting dates.

2.23 Another noteworthy aspect was that between August and September 2020, four workshops had been held on ANP Vol III and GANP/6 (see WP/1.2). Some GESEA delegates had been designated to participate on behalf of their States and had been able to obtain better knowledge of the planning tools.

2.24 The draft SAM CONOPS was still in its initial phase and it was deemed advisable to pause the work of the TF until after the workshop on the AN-SPA tool was held, which was tentatively scheduled for the end of November 2020.

2.25 A very important aspect was that, in 2021, a training course for airspace planners and on airspace regulation would be carried out in parallel with CONOPS tasks, under programmes being prepared by Brazil and in coordination with GESEA.

2021 Work Plan

2.26 Accordingly, the GESEA Coordination and the Secretariat informed the Meeting about the 2021 work plan scheme to be submitted to the consideration of the Plenary (third day of the session) in a working paper, which had been distributed *via* e-mail to the delegates and posted on the Meeting's website. The approved 2021 work plan is shown under agenda item 4.

Information submitted

2.27 Uruguay reported on its successful participation in GESEA and subgroup activities.

2.28 Argentina, Bolivia, and Ecuador presented papers on the status of PBN implementation. Colombia presented information on EDE implementation, which was also the subject matter of a verbal presentation by Chile.

2.29 The Meeting considered this information to be an excellent step forward, and highlighted the efforts of the administrations and ATM staff, taking into account work limitations imposed by the pandemic. The information papers are available on the Meeting website.

APPENDIX A

VIRTUAL MEETING OF THE GESEA SUBGROUP 1 DCT-FRA AD HOC GROUP

SUMMARY OF STUDIES

APPENDIX A

VIRTUAL MEETING OF THE GESEA SUBGROUP 1 DCT-FRA AD HOC GROUP

SUMMARY OF STUDIES

Sessions:

1. Wednesday, 17 June 2020
2. Thursday, 2 July 2020
3. Wednesday, 15 July 2020
4. Wednesday, 29 July 2020
5. Wednesday, 12 August 2020

Participants: Delegates of RLA/06/901States

- ✓ Material, presentations and session recordings: available at the following GESEA cloud link (OneDrive):

https://onedrive.live.com/?authkey=%21AvxOvPHYpEPdtzU&id=4B2F65A2BBF9F10F%21182601&cid=4B2F65A2BBF9F10F

The meeting of the Ad hoc Group on strategic direct routing – EDE (in Spanish: Enrutamiento Directo Estratégico) and free route airspace (FRA) was held through 5 virtual meetings, as shown in the box above.

1. JOB CARD

On this matter, the rapporteur presented the proposed JOB CARD, which shall be used to guide the work of the group. The meeting approved the final version of the JOB CARD, shown in **Appendix A**, which will be submitted to the approval of GESEA. The meeting underlined that the JOB CARD was a living document that could be modified, subject to the approval of GESEA.

2. Status of implementation of strategic direct routing (EDE) in the South American Region

In this regard, the States that had already implemented EDE informed about the strategy adopted for such implementation. IATA showed a map summarising the status of implementation in the SAM Region, which is shown in **Appendix B**. References to aeronautical publications associated to EDE implementation in each State are available in the table shown in Appendix B.

3. Review of FRTO – B0/1 – (Global Air Navigation Plan - Version 6)

In this regard, the Meeting reviewed the content of the Global Air Navigation Plan in relation to FRTO B0/1. In general terms, the following aspects were highlighted:

1) Objectives

   a. Provide airspace users with additional flight planning, with route options on a larger scale across FIRs, so that planned distances can be generally reduced compared to the fixed route network.
   b. Strategic direct routing (EDE) will be established at national and regional level, and is made available for **flight planning** (with published terms of use). The EDE shall be considered as a **transition to the implementation of the free route airspace (FRA) concept**. EDE operations enable airspace users to optimise flight and fuel planning.

2) The EDE could be implemented in a limited manner, for example:
   a. Time restriction (fixed or subject to traffic/availability);
   b. Traffic restriction (based on traffic flow and/or level);
   c. Flight level;
   d. Lateral restrictions;
   e. Entry/exit points.

3) The following procedures and processes may need to be considered:
   a. Identify EDE airspace volume (lateral y vertical) and applicable time;
   b. Direct routes may coexist with the ATS route structure;
   c. Adapt airspace design to ensure horizontal and vertical connectivity with EDE.
   d. ATFM procedures for EDE;
   e. Review the LoAs with adjacent ATS units;
   f. Publish data relevant to EDE in the AIP;
   g. Airspace management procedure for the implementation of direct routes;
   h. ATC procedures for EDE coordination, including handover, path changes in direct routing, conflict detection.

4) Operational and dependent relationship with other ASBU elements

   a. NOPS-B0/1 Initial integration of collaborative airspace management with air traffic flow management

      The integration of airspace management and air traffic flow management is a desirable requirement, with a view to optimising EDE implementation in the SAM Region.

   b. FRTO-B0/2 - Airspace planning and Flexible Use of Airspace (FUA)

      The application of FUA could optimise EDE implementation, taking into account that DCT routes could enter special use airspace, in accordance with pre-established procedures.

   c. FRTO-B0/4 - Basic conflict detection and conformance monitoring

      Medium-Term Conflict Detection (MTCD) and Conformance Monitoring tools are considered as requirements to reduce the workload of air traffic controllers in high air traffic volume settings. Accordingly, they can be considered as desirable requirements and should be taken into account when upgrading ATM systems.

   d. FICE-B0/1 - Automated basic interfacility data exchange (AIDC)

Similarly, AIDC is considered a desirable tool for EDE implementation, with a view to reducing ATCO workload, especially in high air traffic volume operational environments, particularly when there is handover of EDE flights in both FIRs.

5) Enablers
Regarding enablers, the Global Air Navigation Plan, in FRTO BO/1, lists a series of EUROCONTROL documents that could be used as guidance material. However, EDE implementation in the SAM Region must take into account airspace characteristics and air traffic demand, which is significantly less than in Europe.

6) KPI – Key performance indicators

INTENDED PERFORMANCE IMPACT ON SPECIFIC KPAS AND KPIS

KPA	Focus Areas	Most specific performance objective(s) supported	KPI Impact	KPI
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route network design	++	KPI04: Filed flight plan en-route extension

4. Products and activities by the Group

The Meeting defined the products to be developed by the DCT-FRA and by SAM States, with the corresponding dates and responsible parties. The aim is that the products to be developed by the group itself be delivered to GESEA's SG 1 at the next plenary meeting, to be held on 27 and 28 August, via videoconference.

1) Recovery phase

a) Review the status of implementation of strategic direct routing in the CAR/SAM Regions
   i) Responsible: Julio Pereira
   ii) Target date: 17 June 2020

b) Review the content of FRTO B0/1 of the Global Air Navigation Plan
   i) Responsible: Julio Pereira
   ii) Target date: 17 June 2020

c) Implement strategic direct routing in low air traffic volume airspaces, as a function of COVID-19, based on the experience gained in its implementation in some South American States. The EDE has already been implemented in Brazil, Colombia, Ecuador, Guyana, Panama, and Venezuela. This initiative could be applied in the remaining States, in accordance with their operational characteristics, provided there is adequate VHF coverage and ATS surveillance.

   i) Responsible: States.

ii) Target date: 5 November 2020

d) Develop an aeronautical publication model for the implementation of FRTO B0/1.
AIP supplements with a NOTAM trigger should be used for provisional implementation during COVID-19. The definitive implementation should be incorporated into AIP ENR 1.10.
Develop an AIP Supplement model.

i) Responsible: Julio Pereira/Fernando Hermoza.
ii) Target date: 29 July 2020

e) Develop a model/guide for safety assessment related to the implementation of FRTO B0/1. Simple assessment based on the model developed by the SRVSOP.

i) Responsible for the model: Fernando Hermoza.
ii) Target date: 12 August 2020

f) Develop an educational brochure to disseminate the EDE concept among ATCOs and pilots, ARO officers.
i) Responsible: Rosanna Baru
ii) Target date: 12 August 2020 (DCT-FRA 5)

2) Normal phase

a) Update the letters of operational agreement for the implementation of EDE

Example: Assess the need to publish waypoints in FIR boundaries to promote direct routes that involve more than one FIR.

i) Responsible: States
ii) Target date: TBD

b) Develop a training guide for ATCOs involved in the implementation of FRTO B0/1. Specific meetings will be held to develop the guide, as needed.

i) Responsible: Rosanna Baru
ii) Target date: 12 August 2020

c) Establish FRTO B0/1 implementation requirements (ATS surveillance coverage, VHF coverage, MTCD, path monitoring)
Radar coverage and VHF coverage are essential requirements for EDE implementation.
MTCD and path monitoring are desirable requirements for reducing ATCO workload.

Verify ATC surveillance coverage, VHF coverage, MTCD availability, and path monitoring

i) Responsible: States
ii) Target date: 12 August 2020 (DCT-FRA 5)

d) Verify the impact on AIDC implementation
AIDC is not a requirement for the application of EDE. In certain cases, when applying EDE, the FPL must provide a LAT/LONG waypoint prior to the transfer point between ATC units, in order for the AIDC to function properly. Verify ATECH, INDRA, and THALES systems.

i) Responsible: Fernando Hermoza/Luis Perales, with the support of State focal points.
ii) Target date: 12 August 2020 (DCT-FRA 5)

e) Establish the key performance indicators
Develop KPI 4 of the Global Air Navigation Plan. Efficiency is already being measured by ADS-B, with the application of the SIMS system. Seek airline support for KPI sampling.

i) Responsible: Julio Pereira
ii) Target date: 12 August 2020 (DCT-FRA 5)

f) Definitively implement strategic direct routing

i) Responsible: States.
ii) Target date: 5 November 2020 (States that have already implemented it on a provisional basis)
TBD (States that implement it on a provisional basis on 5 November 2020)

5. Completion of activities for EDE implementation at the end of the 5 virtual sessions of the DCT-FRA/1 meeting

Recovery phase

a) Review the status of implementation of strategic direct routing in the CAR/SAM Regions
Status: Completed

b) Review the content of FRTO B0/1 of the Global Air Navigation Plan
Status: Completed

c) Implement strategic direct routing in low air traffic volume airspaces, as a function of COVID-19, based on the experience gained in its implementation in some South American States. The EDE has already been implemented in Brazil, Colombia, Ecuador, Guyana, Panama, and Venezuela. This initiative could be applied in the remaining States, in accordance with their operational characteristics, provided there is adequate VHF coverage and ATS surveillance.

Comments by the DCT-FRA/1 meeting: The meeting noted that EDE implementation in the recovery phase should be simple, based on the published reporting points/waypoints/radio aids. States may use, according to the characteristics of each airspace, the AIP supplement models developed by the DCT-FRA group, which are shown in Appendix C and D. In addition to providing fuel savings to users, the implementation of EDE in this phase will be used as a way to gain experience in the application of the concept, at a time of low air traffic demand resulting from COVID-19.

Status: In progress

d) Develop an aeronautical publication model for the implementation of FRTO B0/1
AIP supplements with a NOTAM trigger should be used for the provisional implementation during COVID-19. Final implementation should be incorporated into AIP ENR 1.10.

Comments by the DCT-FRA-1 meeting: The two AIP Supplement models approved by the DCT-FRA/1 meeting are attached as **Appendix C** and **D.** These AIP Supplement models include some options that could be considered by States for the implementation of EDE according to their operational characteristics. One model should be used by States intending to make a full implementation, including departures and take-offs from the FIR concerned, while the other model should be applied by States seeking initial implementation only for overflights.

Status: Completed

e) Develop a safety assessment model/guide for FRTO B0/1 implementation. Simple assessment based on the model developed by the SRVSOP.

Comments by the DCT-FRA-1 meeting: The meeting reviewed and approved the safety assessment template submitted by the ICAO Secretariat, which is attached as **Appendix E**. This template should be used by States to conduct their own safety assessments.

Status: Completed

f) Develop an educational brochure to disseminate the EDE concept among ATCOs and pilots, ARO officers.

Comments by the DCT-FRA-1 meeting: The meeting reviewed the video provided by the delegation of Uruguay, which should be used by SAM States to raise awareness among professionals involved in the implementation and operation of EDE, mainly air traffic controllers and pilots, about the importance of this concept for the recovery of the aviation industry post-COVID.

The video (EDE SAM SG1) is available in the GESEA cloud, at:

https://onedrive.live.com/?authkey=%21AvxOvPHYpEPdtzU&id=4B2F65A2BBF9F10F%21182601&cid=4B2F65A2BBF9F10F

Status: Completed

2) Normal phase

a) Update the letters of operational agreement for the implementation of EDE

Example: Assess the need for publishing waypoints at FIR boundaries to encourage direct routes involving more than one FIR.

Status: In progress

b) Develop a guide for training ATCOs involved in the implementation of FRTO B0/1. Specific meetings will be held to develop the guide, as needed.

Comments by the DCT-FRA-1 meeting: The draft training guide was assessed by the meeting, including the requirements for the implementation of ATC simulators for air traffic controller training in the definitive EDE implementation phase. These drafts are attached as **Appendix F.**

Status: In progress

c) Establish the requirements for implementation of FRTO B0/1 (ATS surveillance coverage, VHF coverage, MTCD, path monitoring)
Radar coverage and VHF coverage are essential requirements for DCT implementation.
MTCD and path monitoring are desirable requirements for reducing ATCO workload.

Verify ATC surveillance coverage, VHF coverage, MTCD availability and path monitoring.

Comments by the DCT-FRA-1 meeting: The meeting felt that a basic requirement for EDE implementation in the recovery phase would be the existence of VHF coverage and ATS surveillance. During this phase, MTCD and path compliance requirements should be considered only if they were required as part of a mitigation measure established in a safety assessment process. In this sense, the meeting requested that the members of the working group coordinate with CNS experts the analysis of VHF coverage/ATS surveillance, as well as the characteristics of the MTCD and path compliance tools existing in ATC systems; for example, if the available MTCD tool is capable of issuing alarms for flights conducted under EDE. The delegation of Ecuador provided a video on path formation, based on their experience with the INDRA tool. This video is available in the GESEA cloud (GESEA\4 SUBGRUPO 1 - PLAN E_A\GRUPOS DE TRABAJO x TF\DCT-FRA\DCT-FRA-1-5).

Status: In progress

d) Verify the impact on AIDC implementation
AIDC is not a requirement for EDE implementation. In some cases, when applying EDE, the FPL must provide a LAT/LONG waypoint prior to the transfer point between ATC units, in order for the AIDC to function properly. Check the ATECH, INDRA, and THALES systems.

Comments by the DCT-FRA-1 meeting: Although AIDC is not a requirement for EDE, the meeting considered that an assessment was needed so as not to affect the implementation of AIDC in the SAM Region, taking into account that this is a safety-related initiative aimed at reducing LHDs. Thus, the meeting requested that members coordinate with appropriate experts the assessment of the impact of EDE implementation on AIDC, as well as, if necessary, appropriate mitigation measures. The meeting also concluded that the AIP Supplement should not make reference to the AIDC, but that each State should consider specific FPL requirements to avoid a negative impact on the proper functioning of AIDC.

Status: In progress

e) Establish key performance indicators
Develop KPI 4 of the Global Air Navigation Plan. Efficiency is already being measured by ADS-B, with the application of the SIMS system. Seek airline support for KPI sampling.

Comments by the DCT-FRA-1 meeting: The secretary made a presentation about the ICAO SIMS system, where information about GANP KPI 4 could be obtained. However, information from all FIRs is not yet available. IATA presented a template to be completed with fuel, flight time and flight distance data by the Brazilian airlines to support the implementation of DCT routes in Brazil. This template may be used as a basis for collecting data from other airlines to support

implementation in other States. This Excel spreadsheet is attached as Appendix G. The sample template is available in the GESEA cloud (GESEA\4 SUBGRUPO 1 - PLAN E_A\GRUPOS DE TRABAJO x TF\DCT-FRA\Informe).

Status: In progress

f) Definitively implement strategic direct routing
States that have already implemented EDE on a provisional basis could implement it definitively on **5 November 2020**. States that have not yet done so could gain experience initially by implementing it provisionally on **5 November 2020.**

Status: In progress

6. Other matters

Under this agenda item, IATA made a presentation on Brazil's fuel savings as a result of the implementation of direct routes at a tactical and strategic level, as shown in Appendix H. A summary of the results can be seen in the table below, showing the importance of EDE implementation as part of the industry's recovery process.

FUEL SAVINGS (KG)				
	Optimised preferred routes	EDE	Tactical routes (ATCO)	TOTAL
APRIL	127485	4005	301560	433050
MAY	150994	3878	261901	416772
JUNE	209813	5359	325248	540419
JULY	329156	11610	504997	845763

Appendix A

FINAL VERSION
DCT-FRA JOB CARD

JOB CARD **STRATEGIC DIRECT ROUTING (FRTO-B0/1)**

PART I

Strategic Objective(s)	**Phase 1 – Strategic direct routing (EDE - FRTO-B0/1)** Recovery scenario Continue implementing strategic direct routing, based on the reduction of air traffic demand, with a view to providing early gains for airspace users and gaining experience in air traffic management with strategic direct routing. Normal scenario Maintain the strategic direct routing already implemented in the recovery scenario, in order to provide airspace users with additional flight planning, with route options on a larger scale across FIRs, so that planned distances can be reduced overall, compared to the fixed route network. Strategic direct routing (EDE) will be established at national and regional level and made available for flight planning (with published conditions of use). EDE is to be considered as a transition to the implementation of the free route airspace (FRA) concept. EDE operations allow airspace users to optimise flight and fuel planning.	Reference: Global Air Navigation Plan – FRTO – B0/1
Macro-activity	Regulation - Implementation	
Activity	Implementation of strategic direct routing in the South American Region	
Proposed by	GESEA – SG1	
Definition of the problem	The implementation of the SAM ATS route network version concept was approved at the SAM/IG/3 meeting (Lima, Peru, 20-24 April 2009) through Conclusion SAM/IG/3-1. The objective was to implement an integrated development concept, including a more comprehensive analysis of the route network, based on air traffic flow statistical data and the navigation capacity of the fleet, aiming at the elimination of unused routes and the exclusion or reduction of "conventional" routes.	

	Building on the concept of route network versions over the past 10 years, the SAM/IG and ATSRO meetings were responsible for the complete restructuring of the SAM ATS route network, which involved the implementation, realignment and elimination of hundreds of ATS routes. The next step in the natural evolution of airspace optimisation is the use of free route airspace (FRA), as set out in the Global Air Navigation Plan, considering strategic direct routing as a transition for the implementation of FRA. The use of fixed ATS routes can no longer provide the efficiency required for airspace users to obtain fuel savings and the reduction of greenhouse gas emissions. In this sense, a change was made in the airspace optimisation strategy in South America through the implementation of ASBU FRTO B0/B1. It is important to note that, according to the GANP, the necessary documents and the guidance material for the implementation of ASBU B0 are already available, and those corresponding to ASBU B1 will be published by 2020.			
<<<<<<<Detail **PART II**	Recovery phase a) Review the status of implementation of strategic direct routing in the CAR/SAM Regions b) Review the content of FRTO B0/1 of the Global Air Navigation Plan c) Implement strategic direct routing in airspaces with low air traffic volume, as a function of COVID-19, based on the experience gained in its implementation in some South American States. d) Develop an aeronautical publication model for FRTO B0/1 implementation e) Develop a safety assessment model/guide for FRTO B0/1 implementation f) Develop an educational brochure to disseminate the EDE concept among ATCOs and pilots, ARO officers. Normal phase a) Develop model letters of operational agreement for the implementation of FRTO B0/1 b) Establish the requirements for the implementation of FRTO B0/1 (radar surveillance coverage, VHF coverage, MTCD, path monitoring) c) Develop a training guide for ATCOs involved in FRTO B0/1 implementation d) Establish key performance indicators e) Definitively implement strategic direct routing.			
Priority	**High X**	Medium	Low	
Justification for acceptance/rejection	N A			
Routing of the issue	SG1		Creation of the GADHOC: ☒ Yes ☐ No	
Ongoing actions	NIL			

References	Global Air Navigation Plan – FRTO B0/1
Interactions with GANP elements	NOPS-B0/1 - Initial integration of collaborative airspace management with air traffic flow management FRTO-B0/2 - Airspace planning and Flexible Use of Airspace (FUA) FRTO-B0/4 - Basic conflict detection and conformance monitoring FICE-B0/1 - Automated basic inter facility data exchange (AIDC) FRTO-B1/1 - FRA
Other interactions	South American airspace CONOPS e-ANP Volume III

Appendix B

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1)

17-Jun

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Argentina	SACF, SAEF, SARR, SAVF, SAMF		In analysis - To be Confirmed				
Brazil	SBAZ / Amazonica	N0022/20	Available now	FL according to ICAO ANNEX 2(APPENDIX 3) and ICA 100-12 - ANNEX E	Distance between waypoints must not exceed 200NM	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	
Brazil	SBRE / Recife	N0022/20	Available now	FL according to ICAO ANNEX 2(APPENDIX 3) and ICA 100-12 - ANNEX E	Distance between waypoints must not exceed 200NM	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	ARRIVALS: to SBBS and SBCW should join the ATS routes

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1)

17-Jun

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Central America	MHTG / CENAMER	AIC A 4/20	Available now	At or above FL200	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	DEPARTURES: the DCT must start at the last waypoint on the SID	ARRIVALS: DCT route must end at the STAR initial waypoint of WPY before leaving the CENAMER FIR
Colombia	SKEC / Barranquilla	AIP ENR 1.3-1	Availability now	From FL210 and Above	Avoid Restricted, Dangerous and Prohibited areas	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	
Colombia	SKED / Bogota	AIP ENR 1.3-1	Available now	From FL210 and Above	Avoid Restricted, Dangerous and Prohibited areas	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1)

17-Jun

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Curacao	TNCF / Curacao	AIC05/20 A0217/20	Available from May 20th	EN-ROUTE: Use published waypoints for entry, inside and exit of FIR and aobove FL280	DEPARTURES: Follow SID to waypoint of your SID name and free route to exit waypoint of FIR	ARRIVALS: From entry waypoint of FIR, use free route to ingress point for STAR.	
Dominican Republic	MDCS / Santo Domingo	A0151/20	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	Avoid Restricted, Dangerous and Prohibited areas	DEPARTURES: the DCT could start from the last waypoint on the SID	ARRIVALS: the DCT could end at the waypoint where the STAR begins
Ecuador	SEFG / Guayaquil	ENR 1.10	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	Avoid Restricted, Dangerous and Prohibited areas		

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1)

17-Jun

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Guyana	SYGC / Georgetown	AIP ENR 1.10-1	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries			
Jamaica	MKJK / Kingston	AIC A27/20 A0252/20	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	ARRIVALS: the DCTs could end at the STAR initial WPT or The WPT previous the descend below the minimum safe altitude	DEPARTURES: at The end of the SID (last waypoint in the SID), or The waypoint after crossing the minimum safe altitude	

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1)

17-Jun

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Mexico	MMFR / Mexico	A2617/20	Available from May 16th	ALL: -At and Above FL200 -distances between lat/long and/or waypoints in FPL item 15 not exceeding 200NM as per ICAO doc4444 appendix 2 -Avoid dangerous, prohibited and restricted areas	EN-ROUTE: Mandatory use of published waypoints at the MMFR FIR boundaries and when crossing the CTAs: MMID, MMZT, MMEX AND/OR MMTY	ARRIVALS: the DCT must end at the STAR initial WPT or within the STAR before leaving the ATS surveillance service	DEPARTURES: at the last SID WPT or as instructed by ATC
Panama	MPZL / Panama	ENR 1.10	Availability now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	ARRIVALS and DEPARTURES: the end/start of the DCT routing should be at the TMA boundary waypoint		

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1)

17-Jun

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Peru	SPIM / Lima		In analysis - To be Confirmed				
Trinidad & Tobago	TTZP / Piarco		Confirmed - Publication expected				
Venezuela	SVZM / Maiquetia		Availability now				

Updated **15-May**

Preferred routes (DCT) implementation in the LATAM-CAR region

State	FIR	Doc./ reference	DCT Routing Status	Route description / Comments
Cuba	MUFH / Habana	approval letter 15/May/2020	Available now	CANOA DCT ULARI – ULARI DCT CANOA CANOA DCT LENUK – LENUK DCT CANOA CANOA DCT NOSAT CANOA DCT EMOSA – EMOSA DCT CANOA MAXIM DCT NUKAN – NUKAN DCT MAXIM ALURU DCT ATUVI – ATUVI DCT ALURU PABEL DCT IKBIX SELEK DCT IKBIX FUNDI DCT LEPON URSUS DCT GAXER GAXER DCT ZEUSS URSUS DCT NIBEO EPSIM DCT ZEUSS BORDO DCT GELOG – GELOG DCT BORDO EMABU DCT ENAMO – ENAMO DCT EMABU VIKRO DCT ENAMO – ENAMO DCT VIKRO GHANN DCT ULDAR – ULDAR DCT GHANN GHANN DCT VIKRO – VIKRO DCT GHANN
Brazil	SBBS / Brasilia	NOTAM J0282/20	Available now	Use of Opticional Routes listed in https://www.aisweb.aer.mil.br/?i=espaco-aereo&p=playbook
Brazil	SBCW / Curitiba	NOTAM K0516/20	Available now	Use of Opticional Routes listed in https://www.aisweb.aer.mil.br/?i=espaco-aereo&p=playbook
USA	Continental NAS	NAS AC90-91K	Available now	
		7210.3BB	Available now	
		HAR	Available now	

Appendix C

SAMPLE AIP SUPPLEMENT

ONLY OVERFLIGHTS

Phone:
Fax:
E-mail:
Sitatex:
Telex:

S T A T E

AERONAUTICAL INFORMATION SERVICE

AMDT AIP/Supplement N°
XX / XX
XX XX , 2020

IMPLEMENTATION OF STRATEGIC DIRECT ROUTING IN THE UPPER AIRSPACE OF THE XXX FIR

1. PURPOSE

1.1 The purpose of this AIP Supplement is to report on [or establish processes for] the implementation of strategic direct routing in the upper airspace of the XXXX FIR, following the procedures described below.

2. INTRODUCTION

2.1. In South America, the SAM ATS route network was completely restructured over the past 10 years, involving the implementation, realignment and elimination of hundreds of ATS routes, leading to a more direct and efficient fixed route structure.

2.2. The use of fixed ATS routes no longer provides the efficiency required for airspace users to achieve fuel savings and the reduction of greenhouse gas emissions. The next step in the natural evolution of airspace optimisation is the use of free route airspace (FRA), as set out in the Global Air Navigation Plan, considering strategic direct routing (EDE) as a transition to the implementation of FRA.

3. DEFINITIONS AND ABBREVIATIONS

3.1. For the purposes of this AIP Supplement, the following definition applies:

3.1.1. Strategic direct routing (EDE) – Direct route inserted in the flight plans, using the published significant points (waypoints) and radio aids, with the purpose of planning more efficient routes, based on the procedures established below.

Note: Significant points (waypoints) based on LAT/LONG could be applied, depending on available ATC systems and airspace characteristics. A LAT/LONG waypoint may be required to meet specific requirements of the automated ATC system.

4. OPERATIONAL PROCEDURES FOR EDE IMPLEMENTATION

4.1. Adequate ATS surveillance and VHF communication coverage is an essential requirement for the use of EDE in continental airspace.

4.2. The implementation of ADS-C/CPDLC is an essential requirement for EDE operations in oceanic airspaces.

4.3. EDE will not be applied in partial or total ATS contingency situations.

4.4. Flight plans

4.4.1. The cruise level table of Appendix 3 to (ICAO) Annex 2 shall be applied.

4.4.2. The flight plan shall be based on the published significant points (waypoints) or radio navigation aids.

4.4.3. The flight plan shall contain a significant point (waypoint) at FIR boundaries.

4.4.4. The distance between published significant points (waypoints) inserted in the flight plan shall not be greater than xxx NM (or xxx minutes of flight).

Note: Doc. 4444:
The track of flights operating predominantly in an east-west direction between 70°N and 70°S, by reference to significant points formed by the intersections of half or whole degrees of latitude with meridians spaced at intervals of 10 degrees of longitude. For flights operating in areas outside those latitudes the tracks shall be defined by significant points formed by the intersection of parallels of latitude with meridians normally spaced at 20 degrees of longitude. The distance between significant points shall, as far as possible, not exceed one hour's flight time. Additional significant points shall be established as deemed necessary.

4.4.5. FPLs should contain a reporting point (LAT/LONG) at a maximum distance of XX NM or equivalent to XX minutes before the FIR boundary.

Note: Each State shall establish specific FPL filling requirements to meet ATS system specifications, with a view to avoiding rejection or delay in FPL processing. The attachment to this AIC presents models for filling the FPL form applying the EDE concept, and addresses several cases applicable within the FIR and for international departures/arrivals.

5 ADDITIONAL INFORMATION

Additional information can be obtained through the following contacts:

- Dirección General de Aeronáutica Civil/Directorate General of Civil Aeronautics
  - Nnnnnnn email
- ICAO Lima
  Mr. xxx xxxxx (email: xxxxxx@icao.lima.int)

ATTACHMENT

[The State includes in this attachment, in accordance with the specific requirements of its automated systems, messaging and/or ATS procedures, models for filling in box 12 of the flight plan, as guidance for the staff of ARO AIS services, AFS communications, ATC and air operators.]

Appendix D

MODEL AIP SUPPLEMENT

ALL FLIGHTS, INCLUDING ARRIVALS AND DEPARTURES

Phone: Fax: E-mail: Sitatex: Telex:	**S T A T E** **AERONAUTICAL INFORMATION** **SERVICE**	AMDT AIP/Supplement N° XX / XX XX XX , 2020

IMPLEMENTATION OF STRATEGIC DIRECT ROUTING IN THE UPPER AIRSPACE OF THE XXXX FIR

1. PURPOSE

1.1 The purpose of this AIP Supplement is to report on [or establish processes for] the implementation of strategic direct routing in the upper airspace of the XXXX FIR, following the procedures described below.

2. INTRODUCTION

2.1. In South America, the SAM ATS route network was completely restructured over the past 10 years, involving the implementation, realignment and elimination of hundreds of ATS routes, leading to a more direct and efficient fixed route structure.

2.2. The use of fixed ATS routes no longer provides the efficiency required for airspace users to achieve fuel savings and the reduction of greenhouse gas emissions. The next step in the natural evolution of airspace optimisation is the use of free route airspace (FRA), as set out in the Global Air Navigation Plan, considering strategic direct routing (EDE) as a transition to the implementation of FRA.

3. DEFINITIONS AND ABBREVIATIONS

3.1. For the purposes of this AIP Supplement, the following definition applies:

3.1.1. Strategic direct routing (EDE) – Direct route inserted in the flight plans, using the published significant points (waypoints) and radio aids, with the purpose of planning more efficient routes, based on the procedures established below.

Note: Significant points (waypoints) based on LAT/LONG could be applied, depending on available ATC systems and airspace characteristics. A LAT/LONG waypoint may be required to meet specific requirements of the automated ATC system.

4. OPERATIONAL PROCEDURES FOR EDE IMPLEMENTATION

4.1. Adequate ATS surveillance and VHF communication coverage is an essential requirement for the use of EDE in continental airspace.

4.2. The implementation of ADS-C/CPDLC is an essential requirement for EDE operations in oceanic airspace.

4.3. EDE will not be applied in partial or total ATS contingency situations.

4.4. Flight plans

4.4.1. The cruise level table of Appendix 3 to (ICAO) Annex 2 shall be applied;

4.4.2. The flight plan shall be based on the published significant points (waypoints) or radio navigation aids;

4.4.3. The flight plan shall contain a significant point (waypoint) at FIR boundaries.

4.4.4. The distance between published significant points (waypoints) inserted in the flight plan shall not be greater than xxx NM (or xxx minutes of flight).

Note: Doc 4444:
The track of flights operating predominantly in an east-west direction between 70°N and 70°S, by reference to significant points formed by the intersections of half or whole degrees of latitude with meridians spaced at intervals of 10 degrees of longitude. For flights operating in areas outside those latitudes the tracks shall be defined by significant points formed by the intersection of parallels of latitude with meridians normally spaced at 20 degrees of longitude. The distance between significant points shall, as far as possible, not exceed one hour's flight time. Additional significant points shall be established as deemed necessary.

4.4.5. FPLs should contain a reporting point (LAT/LONG) at a maximum distance of XX NM or equivalent to XX minutes before the FIR boundary.

Note: Each State shall establish specific FPL filling requirements to meet ATS system specifications, with a view to avoiding rejection or delay in FPL processing. The attachment to this AIC presents models for filling the FPL form applying the EDE concept, and addresses several applicable cases within the FIR and for international departures/arrivals.

4.4.6. Flight plans involving departures from airports located in the XXXX FIR shall/may include the last point of the corresponding SID, which will be considered to be the start of the EDE.

Note: Alternatives to this paragraph

- *Flight plans involving departures from airports located in the XXXX FIR shall follow the published routes up to points XXXX, YYYY, ZZZZ, and VVVV; or*

- *Flight plans involving departures from airports located in the XXXX FIR shall follow the published routes up to a radius of XXX NM from the ZZZ VOR.*

4.4.7. Flight plans involving arrivals at airports located in the XXXX FIR shall/may include the first point of the corresponding STAR, which will be considered to be the end of the DTS.

Note: Alternatives to this paragraph.

- *Flight plans involving arrivals at airports located in the XXXX FIR shall follow the published routes from points XXXX, YYYY, ZZZZ and VVVV; or*

- *Flight plans involving arrivals at airports located in the XXXX FIR must follow the published route from a radius of XXX NM of the ZZZ VOR; or*

- *For non-STAR airports, it should be indicated that FPLs could be planned as direct flights to the IAF or include significant points (waypoints) of the route that should be inserted in the FPL.*

5 ADDITIONAL INFORMATION

Additional information can be obtained through the following contacts:

- Dirección General de Aeronáutica Civil/Directorate General of Civil Aeronautics
  - Nnnnnnnn email

- ICAO Lima
  Mr. xxx xxxxx (email: xxxxxx@icao.lima.int)

ATTACHMENT

[The State includes in this attachment, in accordance with the specific requirements of its automated systems, messaging and/or ATS procedures, models for filling in box 12 of the flight plan, as guidance for the staff of ARO AIS services, AFS communications, ATC and air operators.]

Appendix E

SAFETY ASSESSMENT MODEL

EXAMPLE OF RISK ANALYSIS AND MANAGEMENT MATRIX APPLICABLE TO STRATEGIC DIRECT ROUTING (EDE)

Note: The following example of a matrix is considered valid for the period July - December 2020, with flight/overflight flow reduced to 10% - 40% of the operations recorded in December 2019, for the respective ACC.

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
• **Oceanic** upper airspace • Aircraft transferred and under control and responsibility of the (sector) ACC	Data link failure affects CPDLC and simultaneous HF failure (or HF not available) of the aircraft prevents position reporting to ATC. Absence of aircraft position reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. Flight plan management. Updated flight plan. ATS message. Doc 4444 Appendix 2. 2. ATS surveillance (ADS-C) available. 3. Procedures and methods on aircraft radio transmitter failure. Doc 4444, Ch 8 and Ch 15. 4. Procedures (and/or SUPPS) applicable to oceanic airspace, in case of communications failure. 5. Table of levels, Annex 2, Appendix 3. 6. ACAS/TCAS on board 7. Automated ATC systems with MTCD (medium-term conflict detection) and/or STCA (short-term conflict alert) 8. Communication via satellite phone.	**2D Aceptable** **Improbable: 2** **Minor: D**	The operational requirements for the application of EDE are shown in the AIP SUP xx/20 of [State]
• **Continental** upper airspace • Aircraft transferred and under control and responsibility of the (sector) ACC	Aircraft radio transmitter failure prevents position reporting to ATC. Absence of aircraft position reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. Flight plan management. Updated flight plan. ATS message. Doc 4444 Appendix 2. 2. ATS surveillance (radar or ADS-B) available. 3. Procedures and methods on aircraft radio transmitter failure. Doc 4444, Ch 8 and Ch 15. 4. Transponder code 7600 5. Table of levels, Annex 2, Appendix 3. 6. ACAS/TCAS on board	**2D Acceptable** **Improbable: 2** **Minor: D**	The operational requirements for the application of EDE are shown in the AIP SUP xx/20 of [State].

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
				7. Automated ATC systems with MTCD (medium-term conflict detection) and/or STCA (short-term conflict alert) 8. The ACARS (aircraft communications addressing and reporting system) would allow the position to be received through the aircraft operator.		
• **Oceanic or continental** upper airspace. • Aircraft transferred and under control and responsibility of the (sector) ACC	Severe communication failure in the responsible ACC prevents ATCO from receiving aircraft position reports. The absence of reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. The State ATS Contingency Plan provides for the temporary suspension of EDE during a contingency.	**1E Acceptable** **Extremely Improbable: 1** **Negligible: E**	The operational requirements for the application of EDE are shown in the AIP SUP xx/20 of [State].
• **Oceanic or continental** upper airspace. • Aircraft transferred and under control and responsibility of the (sector) ACC	Presence of bad weather conditions that require the pilot to ask to deviate from the planned route (path). The deviation authorised by ATC causes a path overlap with another aircraft.	This results in a loss of separation between aircraft.	**1C Acceptable** **Extremely Improbable: 1** **Major: C**	N/A	N/A	

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes

<<<<<<<<<<<<<<<<<<<<<<<<

Appendix

Examples of tables and matrices for the analysis of risks and mitigations

Figure 1: Example of risk likelihood table

Likelihood	Meaning	Value
Frequent	— Likely to occur many times (has occurred frequently)	5
Occasional	— Likely to occur sometimes (has occurred infrequently)	4
Remote	— Unlikely to occur, but possible (has occurred rarely)	3
Improbable	— Very unlikely to occur (not known to have occurred)	2
Extremely improbable	— Almost inconceivable that the event will occur	1

Figure 2: Example of severity table

Severity	Meaning	Value
Catastrophic	— Aircraft or equipment destroyed — Several fatalities	A
Hazardous	— Greatly reduced safety margins, physical stress or a workload such that operations personnel can no longer be relied upon to perform their tasks accurately or completely — Severe injuries — Significant damage to equipment	B
Major	— Significant reduction in safety margins, reduced ability of operations personnel to tolerate adverse operating conditions, as a result of increased workload or as a result of conditions affecting their efficiency — Serious incident — Injuries to people	C
Minor	— Operational limitations — Use of emergency procedures — Minor incident	D
Negligible	— Few consequences	E

Figure 3: Examples of risk assessment matrices

Probability of risk	Severity of risk				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E

Risk index range	Description of risk	Recommended action
5A, 5B, 5C, 4A, 4B, 3A	Intolerable	Take immediate action to mitigate risk or suspend the activity. Perform priority safety risk mitigation to ensure that preventive or additional or enhanced controls are in place to reduce the risk index to the tolerable range.
5D, 5E, 4C, 4D 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Tolerable	May be tolerated based on safety risk mitigation. May require a management decision to accept the risk.
3E, 2D, 2E, 1B, 1C, 1D, 1E	Acceptable	Acceptable as is. No further risk mitigation required.

Appendix F

ATC TRAINING GUIDE

GUIDANCE FOR STRATEGIC DIRECT ROUTING TRAINING

SUBJECT: QUALIFICATION AND TRAINING OF PILOTS, ATCOs AND ARO STAFF WITH RESPECT TO THE IMPLEMENTATION OF STRATEGIC DIRECT ROUTING IN THE SOUTH AMERICAN REGION

SECTION A - PURPOSE

This Training Guide seeks to standardise training to facilitate early implementation of STRATEGIC DIRECT ROUTING (EDE) in the South American Region during the pandemic. Likewise, it provides information for the correct interpretation of the standard practices and procedures of the Global Air Navigation Plan, 6th edition, and the SAM CONOPS.

Recovery phase

a) Implement strategic direct routing in low air traffic volume airspaces, as a function of COVID-19, based on the experience gained in its implementations in some South American States.

SECTION B – SCOPE

The scope is aimed at providing:

a) Airspace users with additional flight planning route options on a larger scale in FIRs, so that planned leg distances can be reduced overall, compared to the **fixed** route network**.**

b) Assistance to organisations for the implementation of the STRATEGIC DIRECT ROUTING Basic Training Package in the South American Region.

This training guide provides acceptable, but not the only, alternatives for States to manage EDE training of aviation personnel.

SECTION C – INFORMATION

a) DEFINITIONS

Qualification: Minimum basic knowledge, usually acquired through education programmes, required to practise a profession.

Qualify: To give someone specialised training to perform a professional activity or a specific job.

Competency. Knowledge, skills and attitudes required to perform the specific tasks that a work activity demands.

NOTE: Competencies are generally acquired and assessed through the performance of the work activity or through various training opportunities**.**

b) ACRONYMS

ASBU	AVIATION SYSTEM BLOCK UPGRADE METHODOLOGY
ATCO	AIR TRAFFIC CONTROLLER
EDE	STRATEGIC DIRECT ROUTING (SPANISH; ENRUTAMIENTO DIRECTO ESTRATÉGICO)
FRA	FREE ROUTE AIRSPACE CONCEPT
GANP	GLOBAL AIR NAVIGATION PLAN
GESEA	SAM AIRSPACE STUDY AND IMPLEMENTATION GROUP
KPI	KEY PERFORMANCE INDICATOR

SECTION D – TEACHING AND TRAINING

1) 2020 OPERATIONAL CONCEPT

A. AIRSPACE CONCEPT

B. THEORETICAL ASSUMPTIONS OF THE OPERATIONAL CONCEPT

2) **GANP GLOBAL AIR NAVIGATION PLAN**

A. INTRODUCTION AND ICAO STRATEGIC OBJECTIVES

B. ASBU

C. FRTO B0/1, HIGHLIGHTING THE FOLLOWING ASPECTS:

- EDE, IMPLEMENTATION AND LIMITATIONS:

A. TIME RESTRICTION (FIXED OR DEPENDING ON TRAFFIC/AVAILABILITY);

B. TRAFFIC RESTRICTION (BASED ON TRAFFIC FLOW AND/OR LEVEL);

C. FLIGHT LEVEL;

D. LATERAL RESTRICTIONS;

E. ENTRY/EXIT POINTS.

PROCEDURES AND PROCESSES TO CONSIDER:

A. IDENTIFY THE EDE (LATERAL AND VERTICAL) AIRSPACE VOLUME AND APPLICABLE TIME;

B. COEXISTENCE OF DIRECT ROUTES WITH THE ATS ROUTE STRUCTURE;

C. ADAPT AIRSPACE DESIGN TO ENSURE HORIZONTAL AND VERTICAL CONNECTIVITY WITH EDE.

D. ATFM PROCEDURES FOR EDE;

E. REVISION OF LOAS WITH ADJACENT ATS UNITS;

F. PUBLICATION OF DATA RELEVANT TO EDE (IN THE AIP SEE APP.1 MODEL AMDT AIP SUP EDE);

G. AIRSPACE MANAGEMENT PROCEDURES FOR THE IMPLEMENTATION OF DIRECT ROUTES;

H. ATC PROCEDURES FOR EDE COORDINATION, INCLUDING HANDOVER, PATH CHANGES IN DIRECT ROUTING; CONFLICT DETECTION.

4) OPERATIONAL AND DEPENDENT RELATIONSHIP WITH OTHER ASBU ELEMENTS

5) GANP (6TH EDITION) MODULES/ELEMENTS

A. NOPS-B0/1 INITIAL INTEGRATION OF COLLABORATIVE AIRSPACE MANAGEMENT WITH AIR TRAFFIC FLOW MANAGEMENT

THE INTEGRATION OF AIRSPACE MANAGEMENT AND AIR TRAFFIC FLOW MANAGEMENT IS A DESIRABLE REQUIREMENT, WITH A VIEW TO OPTIMISING EDE IMPLEMENTATION IN THE SAM REGION.

B. FRTO-B0/2 - AIRSPACE PLANNING AND FLEXIBLE USE OF AIRSPACE (FUA)

THE APPLICATION OF FUA COULD OPTIMISE EDE IMPLEMENTATION, TAKING INTO ACCOUNT THAT EDE ROUTES COULD ENTER SPECIAL USE AIRSPACE, IN ACCORDANCE WITH PRE-ESTABLISHED PROCEDURES.

C. FRTO-B0/4 - BASIC CONFLICT DETECTION AND CONFORMANCE MONITORING

MEDIUM-TERM CONFLICT DETECTION (MTCD) AND CONFORMANCE MONITORING TOOLS ARE CONSIDERED AS REQUIREMENTS TO REDUCE THE WORKLOAD OF AIR TRAFFIC CONTROLLERS IN HIGH AIR TRAFFIC VOLUME ENVIRONMENTS. ACCORDINGLY, THEY CAN BE CONSIDERED AS DESIRABLE REQUIREMENTS AND SHOULD BE TAKEN INTO ACCOUNT WHEN UPGRADING ATM SYSTEMS.

D. FICE-B0/1 - AUTOMATED BASIC INTER FACILITY DATA EXCHANGE (AIDC)

SIMILARLY, AIDC IS CONSIDERED A DESIRABLE TOOL FOR EDE IMPLEMENTATION, WITH A VIEW TO REDUCING ATCO WORKLOAD, ESPECIALLY IN HIGH AIR TRAFFIC VOLUME OPERATIONAL ENVIRONMENTS, PARTICULARLY WHEN THERE IS HANDOVER OF EDE FLIGHTS IN BOTH FIRS.

6) ENABLERS

REGARDING ENABLERS, THE GLOBAL AIR NAVIGATION PLAN, IN FRTO BO/1, LISTS A SERIES OF EUROCONTROL DOCUMENTS THAT COULD BE USED AS GUIDANCE MATERIAL. HOWEVER, EDE IMPLEMENTATION IN THE SAM REGION MUST TAKE INTO ACCOUNT AIRSPACE CHARACTERISTICS AND AIR TRAFFIC DEMAND, WHICH IS SIGNIFICANTLY LESS THAN IN EUROPE.

7) KEY PERFORMANCE INDICATORS (KPIS)

STRATEGIC DIRECT ROUTING (EDE) WILL BE ESTABLISHED AT NATIONAL AND REGIONAL LEVEL AND MADE AVAILABLE FOR FLIGHT PLANNING (WITH PUBLISHED CONDITIONS OF USE).

EDE SHALL BE CONSIDERED AS A TRANSITION TO THE IMPLEMENTATION OF THE FREE ROUTE AIRSPACE (FRA) CONCEPT. EDE OPERATIONS ALLOW AIRSPACE USERS TO OPTIMISE FLIGHT AND FUEL PLANNING.

THE NEXT STEP IN THE NATURAL EVOLUTION OF AIRSPACE OPTIMISATION IS THE USE OF FREE ROUTE AIRSPACE (FRA), AS SET OUT IN THE GLOBAL AIR NAVIGATION PLAN, CONSIDERING STRATEGIC DIRECT ROUTING AS A TRANSITION FOR THE IMPLEMENTATION OF FRA. THE USE OF FIXED ATS ROUTES CAN NO LONGER PROVIDE THE EFFICIENCY REQUIRED FOR AIRSPACE USERS TO OBTAIN FUEL SAVINGS AND THE REDUCTION OF GREENHOUSE GAS EMISSIONS.

IN THIS SENSE, A CHANGE WAS MADE IN THE AIRSPACE OPTIMISATION STRATEGY IN SOUTH AMERICA, THROUGH THE IMPLEMENTATION OF ASBU FRTO B0/B1. IT IS IMPORTANT TO NOTE THAT, ACCORDING TO THE GANP, THE NECESSARY DOCUMENTS AND THE GUIDANCE MATERIAL FOR THE IMPLEMENTATION OF ASBU B0 ARE ALREADY AVAILABLE, AND THOSE CORRESPONDING TO ASBU B1 WILL BE PUBLISHED BY 2020.

3) ASSESSMENT OF IMPACT ON PERFORMANCE

[SEE APPENDIX 2, EXAMPLE OF MATRIX FOR ANALYSING AND MANAGING RISKS APPLICABLE TO STRATEGIC DIRECT ROUTING (EDE)]

4) PRACTICE ON A SIMULATOR

A. IMPLEMENTATION CHECKLIST

Appendix 1 – PUBLICATION OF DATA RELEVANT TO EDE IN THE AIP

Appendix 2 – EXAMPLE OF MATRIX FOR ANALYSING AND MANAGING RISKS APPLICABLE TO STRATEGIC DIRECT ROUTING (EDE)

Appendix G

FUEL SAVINGS template

INFORMAÇÕES GERAIS						PLANEJAMENTO												REAL											
						PRE COVID				POS COVID				∆ Avg por voo				FEV 2020				MÊS CORRENTE				∆ Avg por voo			
Empresa Aérea	ORIGEM	ESTIN	TIPO DE ACFT	Tipo de Rota Utilizada	NR OPR	STD plan fuel	STD plan Flight Time	STD plan Flight Dista	STDplan CO2	STD plan fuel	STD plan Flight Time	STD plan Flight Dista	STDplan CO2	∆ avg plan fuel	∆ avg plan flight time	∆ avg plan flight distan	∆ plan CO2	Avg actual fuel	Avg actual Flight Time	Avg actual Flight Dista	Avg actual CO2	Avg actual fuel	Avg actual Flight Time	Avg actual Flight Dista	Avg actual CO2	∆ avg actual fuel	∆ avg actual flight time	∆ avg actual flight distan	∆ CO2
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0

PLANEJAMENTO				REAL				ANEJAMEN	REAL
Avg TOTAL por PAR DE CIDA				Avg TOTAL por PAR DE CIDA					
∆ avg plan fuel	∆ avg plan flight time	∆ avg plan flight distan	∆ CO2	∆ avg actual fuel	∆ avg actual flight time	∆ avg actual flight distan	∆ CO2	VARIAÇÃO % avg plan fuel	VARIAÇÃO % avg real fuel
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!

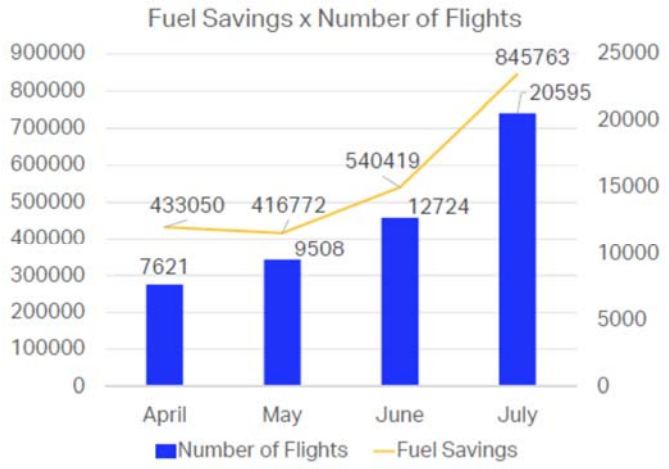
Appendix H

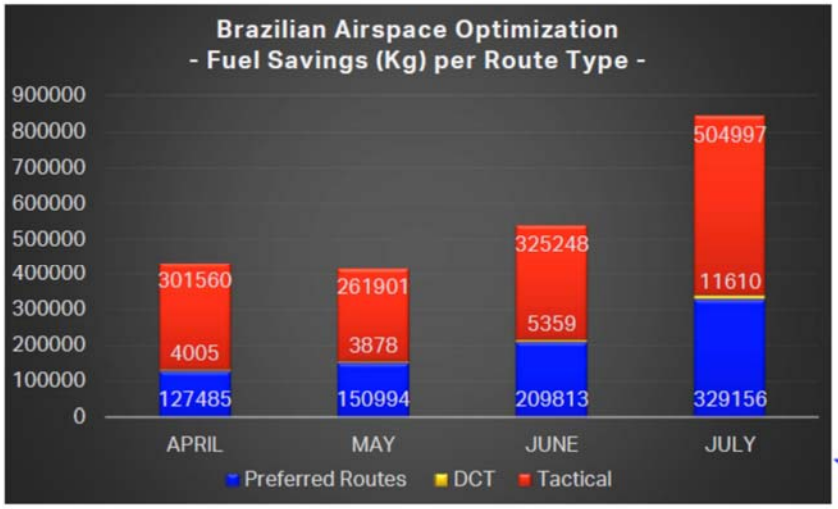
FUEL SAVINGS - BRAZIL

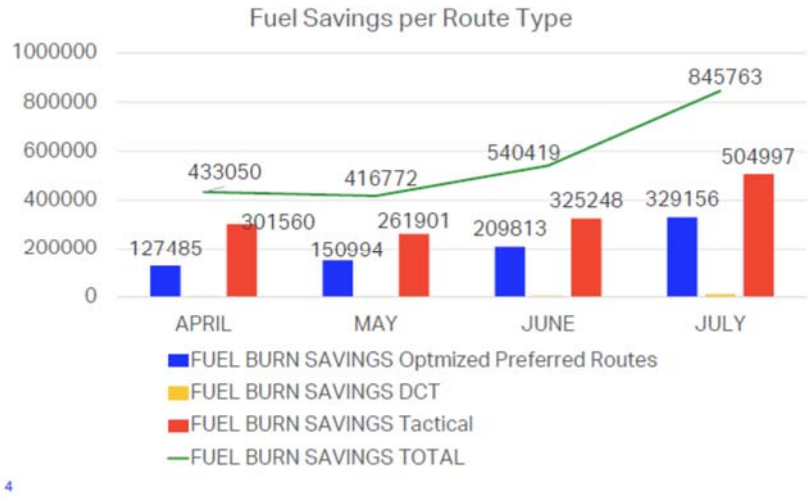
Fuel Savings

DECEA´s Restart Plan

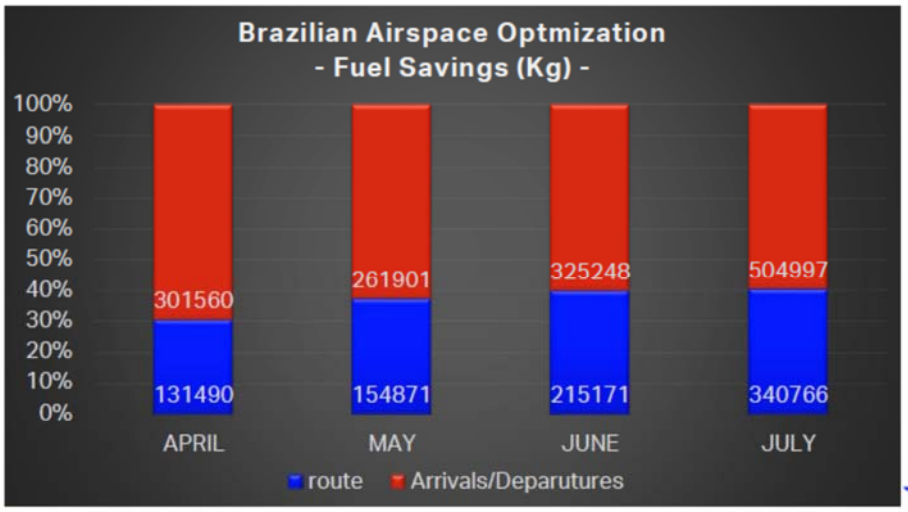
1 16 July 2020




Brazilian Airspace Optimization
- Fuel Savings (Kg) per Route Type -
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
301560
4005
127485
261901
3878
150994
325248
5359
209813
504997
11610
329156
APRIL
MAY
JUNE
JULY
Preferred Routes
DCT
Tactical


Fuel Savings per Route Type
1000000
800000
600000
400000
200000
0
433050
416772
540419
845763
127485
301560
150994
261901
209813
325248
329156
504997
APRIL
MAY
JUNE
JULY
FUEL BURN SAVINGS Optmized Preferred Routes
FUEL BURN SAVINGS DCT
FUEL BURN SAVINGS Tactical
FUEL BURN SAVINGS TOTAL

4



5

IATA

Otimização

- Resultados -

Azul

GOL

LATAM

2.240.000kg

April to June

1.120

Air Shuttle – Rio/São Paulo

APPENDIX B

SAM REGION ATS CONTINGENCY FRAMEWORK PLAN (MCATS/SAM)

APPENDIX B

INTERNATIONAL CIVIL AVIATION ORGANIZATION

SAM REGION ATS CONTINGENCY FRAMEWORK PLAN (MCATS/SAM)

This Framework Plan was developed by the SG1/GESEA CONT PLAN Task Force to address the issue of air traffic service (ATS) contingencies.

It is expected that this Plan will go along with other activities of regional technical entities that have been implementing plans for other issues related to air navigation services (ANS).

The SAM Region should seek to develop harmonised guides for addressing contingencies through broader regional plans, covering all air traffic management (ATM) tasks and/or ANS as a whole.

Version: Original

4 November 2020

SAM REGION ATS CONTINGENCY FRAMEWORK PLAN
(MCATS/SAM)

CHANGE CONTROL

Version	Date	Change	Pages
Original	4 November 2020	Approved SAM/IG/25	

TABLE OF CONTENTS

1.- SCOPE AND STRUCTURE

1.1 The SAM ATS Contingency Framework Plan (hereinafter referred to as MCATS/SAM) falls within a hierarchy of planning documents defining global vision and strategy, and regional implementation action. See Figure 1.

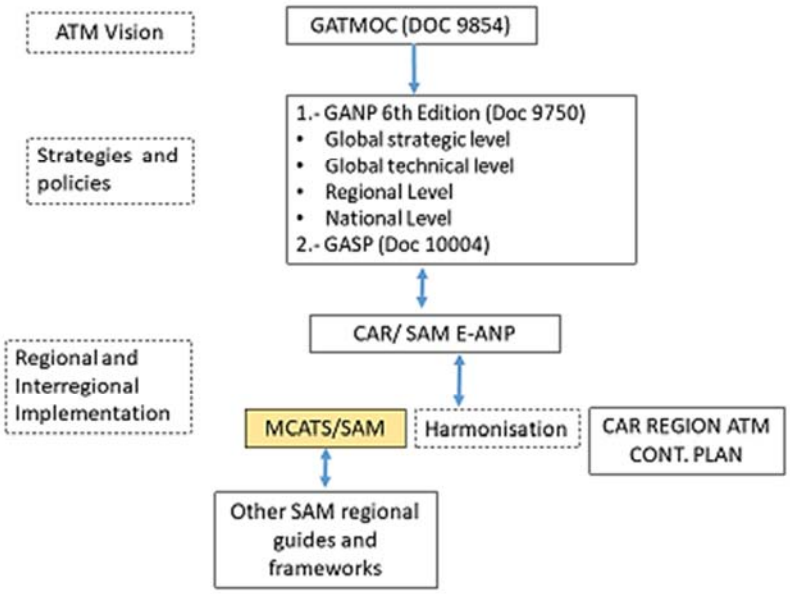


Figure 1: Regional planning, documents and linkages

1.2 The MCATS/SAM is structured to provide:

a) elements and guidelines for ATS contingency planning at regional level, so as to facilitate harmonisation of State plans;
b) regional ATFM planning elements;
c) performance improvements;
d) considerations for research and future development; and
e) milestones, timetables, priorities and actions.

1.3 The MCATS/SAM describes a hierarchy of contingency plans based on an ordered scale of impacts on adjacent States or at regional level. It also describes the types of contingencies with respect to the conditions of ATS provision and the availability of a given space, as detailed below:

a) Hierarchy of contingency plans:

i. **Level 1**, for domestic (internal State) plans dealing with non-regional

airspace and routes, and operations at domestic airports, having no effect on air navigation service providers or units in adjacent States;

ii. **Level 2**, for coordinated/harmonised (inter-State) contingency plans involving two or more States; and

iii. **Level 3,** detailing contingency arrangements designed to enable contingency (alternate) routes at regional and/or sub-regional level, which will allow aircraft operators to cross or avoid airspace within the relevant flight information regions (FIRs).

b) Types of contingencies:

i. **Type A – Airspace safe, but restricted or no ATS (ZERO ATS),** due to causal events such as industrial action/strike, pandemic, earthquake, calamity, nuclear emergency affecting the provision of ATS;

ii. **Type B – Airspace not safe,** due to causal events such as volcanic ash cloud, extreme weather events, nuclear emergency, military activity that is hazardous for civil aviation; and

ii. **Type C – Airspace not available,** due to events such as pandemic causing limited access to airports, national security reasons, and other causes resulting from a political decision by the State.

Note. - Type B and C events involve airlines diverting to avoid affected airspace, based on measures issued in collaboration by ATS and ATFM services.

1.4 MCATS/SAM refers to Level 1 and Level 2 contingency plans. Level 3 contingency plans, including contingency routes and flight level allocation schemes (FLAS), will be developed by the 14 States of the SAM Region through a specific regional agreement.

1.5 The appendices to the plan contain guidelines and guides which, if applicable, can be tailored to the needs of States, with regard to the following subjects:

Appendix A – Glossary of terms

Appendix B – ATS contingency planning principles

Appendix C – Basic plan elements

Appendix D – Contingency plan template

Appendix E – Terms of reference of the coordination and support team (CST)

Appendix F – Regional list of points of contact (Phone tree)

Appendix G – Volcanic ash contingency plan for the ICAO South American Region (VACP/SAM)

Appendix H – Extreme weather contingencies

Review of the MCATS/SAM

1.6 The MCATS/SAM requires periodic updating in March and November of each year to incorporate changes in contingency arrangements and details of the phone tree that lists the points of contact (name of the person and/or position or job title that assumes the function). Updating of the appendices to the plan is carried out by the ICAO SAM Regional Office on receipt of updated information from States, and is not dependent on re-versioning or approval by the regional technical groups (SAMIG meetings, etc.).

1.7 It is intended that SAMIG and/or its contributory bodies conduct a complete review of the MCATS/SAM every three years, or at shorter intervals as determined by SAMIG.

1.8 The ICAO SAM Regional Office shall establish and implement a systematic procedure for the request, publication and annual review of the ATS contingency plans of the States.

2.- OBJECTIVES

2.1 The objectives of the MCATS/SAM are to:

a) provide a contingency response framework for SAM States to ensure the controlled continuation of aircraft operations in affected UIRs/FIRs, including flow between unaffected FIRs, during contingency events;
b) ensure timely, harmonised and appropriate responses to all events resulting in the disruption to the provision of ATS, or in which ATS is involved, thereby disrupting the normal movement of aircraft;
c) provide a higher degree of certainty to airspace and aerodrome users during contingency operations; and
d) facilitate the harmonisation of plans among States/territories/organisations on the common boundary of the CAR/SAM Regions.

2.2 In order to meet these objectives, the MCATS/SAM:

a) provides uniform policy and guidance for responding to reasonably foreseeable operational constraints, including short-, medium- and long-term actions, prevention of contingency system overload and guidelines for implementation and reactivation;
b) reviews the status of ATS contingency plans and the level of contingency preparedness of SAM States;
c) identifies areas where ATS contingency planning requires improvement to comply with ICAO standards and recommended practices (SARPs) defined in Annex 11 - *Air Traffic Services*, and accepted best practices;
d) analyses contingency procedures applied in other ICAO Regions and harmonises, where applicable, with similar work in adjacent airspaces;
e) takes into account the different levels of contingency response necessary for a range of precipitating events;

f) provides principles for ATS contingency planning;
g) details recommended contingency responses to events such as extreme weather and geological phenomena, pandemics, national security and industrial relations issues;
h) provides States with templates for contingency planning; and
i) defines the terms of reference of the Coordination and Support Team (CST) in Appendix E.

3.- CONTINGENCY PLAN PROVISIONS

Requirement for contingency plans

3.1 Annex 11 to the Convention on International Civil Aviation requires that ATS authorities develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services.

3.2 Annex 11 contains standards (SARPs) and guidance material for ATS contingency measures, as follows:

2.32 Contingency arrangements

Air traffic services authorities shall develop and promulgate contingency plans for implementation in the event of the disruption, or possible disruption, of air traffic services and related support services in the airspace for which they are responsible for the provision of such services. Such contingency plans will be developed with the assistance of ICAO as necessary, in close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned.

3.3 In addition, Attachment C to Annex 11 contains guidelines on the development, promulgation and implementation of contingency plans.

3.4 Conclusion 13/68 of the Thirteenth Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/13, held in Santiago, Chile, on 14-18 November 2005) established an action plan for the development of ATS contingency plans in the CAR and SAM Regions.

The action plan was defined in the following phases:

Phase I – Development of ATS contingency plans;

Phase II – Harmonisation of ATS contingency plans with neighbouring States; and

Phase III – Submission of ATS contingency plans to ICAO Regional Offices.

3.5 The GREPECAS/13 meeting also formulated a thematic guide for ATS contingency plans, which is used as a reference for this Framework Plan.

Contingency planning principles

3.6 ATS contingency planning principles are the basis for the development of Level 1, Level 2 and Level 3 contingency plans in response to Type A, B and C contingency events, inter-state contingency agreements, contingency route structures, flight level allocation and aircraft longitudinal separation schemes, communication transfer arrangements, and for any delegation of ATC separation and ATS and SAR alerting services. See **Appendix B.**

Basic plan elements

3.7 The plan contains the basic elements of the plan, which define the minimum recommended considerations for inclusion in Level 1, Level 2 and Level 3 contingency plans. Basic plan elements cover administration, plan management, airspace, ATS procedures, pilot/operator procedures, communication facilities and procedures, aeronautical support services, including AIS (AIM), NOTAM and MET, and contact details. **Appendix C** lists the agreed basic elements.

3.8 Prior to their implementation, ATS contingency plans should be validated through an appropriate safety assessment in the context of the State safety management system.

Note. - ***Appendix D*** *contains a template for the development of* ***Level 2 contingency plans. States can adapt this template for the development of Level 1 plans.***

State contingency plan coordination and operation functions

3.9 Each State, in accordance with the air navigation service management model, should establish a central ATS contingency coordinating committee (CCC) for the drafting, maintenance, activation and implementation of contingency plans, and for the creation and convening of an ATS operational contingency group (AOCG).

3.10 The central coordinating committee should include relevant representation from the regulatory authority, the air navigation service provider - ANSP (including those responsible for the SMS), the competent military authority, other relevant national authorities, representatives of airspace users, the airport meteorological authority, the airport authority and other relevant authorities and agencies.

3.11 The ATS operational contingency group (AOCG) will be convened by the CCC with a primary responsibility to oversee day-to-day operations under the contingency arrangements, and coordinate ATS operational activities, 24 hours a day, throughout the contingency period. The terms of reference of the AOCG will be determined by the CCC. The AOCG should include any input required from experts in the following areas:

a) Air traffic services (ATS)
b) Air traffic flow management (ATFM) service
c) Search and rescue (SAR) service
d) Communication, navigation and surveillance (CNS)
e) Aeronautical meteorology (MET)
f) Aeronautical information management (AIM)
g) Airports and ground aids (AGA)
h) Safety management system (SMS)

3.12 AOCG functions shall include:

a) review and update the Contingency Plan as required;
b) keep up to date at all times of the contingency situation;
c) organise contingency teams in each of the specialised areas;
d) keep in contact with and update all airspace and system users, customers and other relevant stakeholders;
e) exchange up-to-date information with the adjacent ATS authorities concerned included in the coordination and support team (CST) to coordinate contingency activities;
f) notify the designated organisations of the contingency situation sufficiently in advance and/or as soon as possible after its occurrence;
g) take necessary action for issuing NOTAMs (ASHTAMs) in accordance with the contingency plan or as otherwise determined by the particular contingency situation. Where the contingency situation is sufficiently foreseeable, the relevant NOTAMs (ASHTAMs) should be issued 48 hours in advance of the contingency events, using templates; and
h) liaise with the ICAO SAM Regional Office, as required.

3.13 Terms of reference, and procedures for the activation of the ATS operational contingency group (AOCG) function should be developed.

Coordination and support team (CST)

3.15 The Coordination and Support Team - CST (see **Appendix E** for sample terms of reference of the team) brings together the States/ANSPs of the air traffic services adjacent to the State/Administration in a contingency situation. Upon receipt of information on possible activation, pre-activation or effective activation of an ATS contingency plan, the ICAO South American Regional Office organises, coordinates and convenes the CST. The Team is of temporary nature, and will be dissolved when the ATS contingency plan that gave rise to it is terminated.

The main responsibilities of the CST are to:

a) support coordination and exchange of information in case of contingencies affecting, or likely to affect, airspace, airports, communications and/or the provision of air navigation services in the SAM Region;
b) serve as the entity for support and coordination and for the exchange of reliable and up-to-date information. Monitor and exchange relevant up-to-date information with States directly involved, States that are potential participants in contingency arrangements, and other relevant stakeholders;
c) liaise with States and international organisations, users and entities involved (see **Appendix F**, Regional list of points of contact (Phone tree));
d) discuss with States and international organisations and communicate the contingency procedures initiated (*e.g.*, airspace closure, aerodrome closure, system redundancy, or new contingency routes established); and
e) ensure the flow of information to ICAO (Headquarters and Regional Office focal points) and IATA (Headquarters and Regional Office focal points).

Exercises/Drills of contingency plan implementation

3.16 Each SAM State will coordinate with the ICAO South American Regional Office to conduct, at least once a year, exercises/drills of the implementation of its Level 2 contingency plans. These activities will have an agile format and will include the participation of one or more adjacent (external) ATS units involved in the contingency plan, in order to:

a) verify the validity of the phone tree, verify the currency of focal point data, including IATA.
b) review the technical data of the plan, including ATS communications and frequencies, transfer points/airways, aircraft separation, NOTAM procedures, use of the TIBA procedure and auto-transfer, etc.
c) ascertain the efficiency and availability of communications between focal points.

The State is responsible for defining the participation of observers on behalf of entities, organisations, military institutions, users and stakeholders, as it deems appropriate.

Volcanic ash contingency planning

3.17 The ATM/MET/AIM Contingency Plan - Volcanic Ash meeting was held at the ICAO South American Regional Office in Lima, Peru, on 22-26 June 2015. The detailed documentation of the meeting, including the aforementioned guide, is available at:

http://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2015-ATMMETAIMVA

3.18 The meeting, through Conclusion ATM/MET/AIM-VA-01, approved the text of the "Volcanic Ash Contingency Plan for the ICAO South American Region (VACP/SAM)". Accordingly, States have a guide available (see **Appendix G**) for drafting their national volcanic ash contingency plans.

3.19 The text of the VACP/SAM considers the various aspects and actions that States should take into account when volcanic activity affects one or more of their flight information regions (FIRs). The objective of this plan is to offer a general scheme of action for these contingencies through recommendations, procedures, information, examples, etc., to assist in the safe and orderly flow of air traffic in the SAM Region.

Extreme weather contingency planning

3.20 The provisions for the development of Extreme Weather Contingency Procedures for the SAM Region are shown in **Appendix H** (in preparation).

4.- PERFORMANCE IMPROVEMENT

Level 1 contingency plans (see Appendix D)

4.1 Each State should establish an ATS contingency central coordinating committee (CCC) for the development, maintenance, activation and execution of contingency plans, and for the

establishment and convening of an ATS operational contingency group (AOCG).

4.2 Terms of reference and procedures for the activation of the ATS operational contingency group (AOCG) should be developed.

4.3 Level 1 contingency plans that include the basic elements of the regional ATS Contingency Plan should be developed, in accordance with the principles, and implemented at all ATS units.

4.4 Human performance-based training activities and procedures for response to ATS contingency operations for all staff providing ATS-related services, including ATC, flight information, aeronautical information, aeronautical telecommunications, and ATS equipment maintenance personnel should be developed and implemented.

4.5 Programmes for the conduction of regular, inter-unit coordinated desktop exercises of all Level 1 contingency plans should be implemented.

4.6 Processes should be implemented to ensure that the outcomes of any testing, pre-activation or activation of a contingency plan or any contingency drill are reviewed and analysed, and lessons learned incorporated in contingency procedures and training.

4.7 Details of contingency ATS routes and related flight level allocation schemes should be published in Section ENR 3.5 of the State flight information publication (AIP). In addition, this information should be made available on websites for easy access by airlines, operators and interested parties and, where applicable, for expediting the updating of data on contingency routes.

Level 2 contingency arrangements (see Appendix D)

4.8 Each State should establish an ATS contingency central coordinating committee (CCC) for the development, maintenance, activation and execution of contingency plans, and for the establishment and convening of an ATS operational contingency group (AOCG).

4.9 Terms of reference and procedures for the activation of the ATS operational contingency group (AOCG) should be developed.

4.10 Level 2 contingency arrangements should be established for all cases where the pre-activation or activation of a Level 2 contingency plan could impact upon ATS within the area of responsibility of a neighbouring State.

4.11 Level 2 contingency arrangements should include procedures for the tactical definition and promulgation by NOTAM of ATS contingency routes to avoid airspace affected by Type B and C contingency conditions.

4.12 Human performance-based training activities and procedures for response to ATS contingency operations for all staff providing ATS-related services, including ATC, flight information, aeronautical information, aeronautical telecommunications and ATS equipment maintenance personnel should be designed and implemented.

4.13 Programmes for the conduction of regular, inter-unit coordinated desktop exercises of all Level 2 contingency plans should be implemented.

4.14 Processes should be implemented to ensure that the outcomes of any testing, pre-activation or activation of a contingency plan or any contingency drill are reviewed and analysed, and lessons learned are incorporated in contingency procedures and training.

4.15 Details of ATS contingency routes and related flight level allocation schemes should be published in Section ENR 3.5 of the State flight information publication (AIP). In addition, this information should be made available on websites for easy access by airlines, operators and interested parties and, where applicable, for expediting the updating of data on contingency routes.

4.16 The relevant sections of the contingency plans that could have an impact on international flights should be made available on the internet public website of the ANSP, and the hyperlink provided to the ICAO SAM Regional Office for inclusion in the SAM ATS Contingency Plan.

Level 3 contingency plans (regional – sub-regional)

4.17 Level 3 contingency plans, including contingency routes and flight level scheme (FLAS) will be developed by the 14 SAM States through a specific regional agreement (not included in the MCATS/SAM). **Appendix B** contains some considerations for these Level 3 plans; however, it is envisaged that this regional matter will be addressed starting in 2022.

Volcanic ash contingencies

4.18 Volcanic contamination, the most severe of which is caused by volcanic ash, represents a hazard to the safety of air operations. Mitigation of volcanic ash hazards in the atmosphere and/or at the aerodrome cannot be done in isolation, but through collaborative decision-making (CDM), involving all stakeholders. During an eruption, volcanic contamination can reach and surpass cruising altitudes of turbine engine aircraft in a matter of minutes and cover vast geographical areas in a few days. Encounters with volcanic ash can cause a number of hazards, including one or more of the following:

a) Malfunction or failure of one or more engines, causing not only a reduction or total loss of thrust, but also failure of electrical, pneumatic and hydraulic systems;

b) Blockage of sensors feeding avionic systems, causing unreliable airspeed indications and wrong warnings;

c) Partial or total opaqueness of windshields;

d) Contamination of cabin air with smoke, dust and/or toxic chemicals that require the crew to wear oxygen masks, which affects voice communications; it may also affect electronic systems;

e) Erosion of external and internal components of the aircraft;

f) Less efficient electronic cooling, leading to a number of failures in aircraft systems;

g) The aircraft may have to be manoeuvred in a manner which conflicts with other aircraft; and

h) The deposition of volcanic ash on a runway can degrade the braking performance of aircraft, especially if volcanic ash is wet; and, in extreme cases, it can result in runway closure.

4.19 Regulatory authorities of the State of the Operator or State of Registry, as appropriate, should establish appropriate operational procedures to be followed by the flight crew in case of operations in or near airspace contaminated with volcanic ash.

4.20 Operators are required by ICAO Annex 6 - *Operation of Aircraft*, to conduct a risk assessment of operations in volcanic ash and implement appropriate mitigation measures in accordance with their safety management system (SMS), as approved by the State of the Operator or State of Registry, as applicable. The manual on Flight Safety and Volcanic Ash - Risk Management of Flight Operations with known or forecast volcanic ash contamination (ICAO Doc 9974) contains more detailed guidance on safety risk assessment of flight operations in relation to volcanic ash contamination.

4.21 Volcanic ash can also affect the operation of aircraft on aerodromes. Volcanic ash deposition at an aerodrome, even in small quantities, can result in closure of the aerodrome until all deposited ash has been removed. In extreme cases, aerodromes could become totally inoperative, with repercussions on air traffic management (ATS); *e.g.*, landings at alternate aerodromes, re-routing of traffic flow, etc.

4.22 Consequently, a volcanic ash contingency plan, harmonised with the VACP/SAM (see **Appendix G**) should be incorporated into the State ATS contingency plan, so as to include interfaces with supporting services such as aeronautical information (AIS) and meteorology services.

4.23 It is imperative that information on volcanic activity be disseminated as soon as possible. To assist staff in expediting the origination and delivery of relevant messages such as SIGMETs, NOTAMs and ASHTAMs, templates should be made available for each stage of volcanic activity. In the VACP/SAM formulated as regional guidance, you will find examples of SIGMETs, NOTAMs and ASHTAMs containing operational measures and the different stages of volcanic activity. A list of ICAO-registered volcanoes, including the name of the volcano, its number and nominal position, should be made available to staff at the international NOTAM office (see Doc 9691, Manual on volcanic ash, radioactive material and toxic chemical clouds).

4.24 The VACP/SAM has been developed in accordance with a proposal of amendment to the Procedures for Air Navigation Services - Air Traffic Management (PANS-ATM, Doc 4444), paragraph 15.8, Procedures for ATS units when a volcanic ash cloud is reported or forecast, which is already available.

Action by the ATFM service during the ATS contingency

4.25 [IN PREPARATION]

NOTE. - It is expected that ATFM capability for the SAM Region will be implemented in accordance with the guidelines of the ATFM Concept of Operations for the CAR/SAM Regions.

Promulgation and status reporting of State ATS contingency plans

4.26 National ATS contingency plans (Level 2) should be published in Spanish and English (Portuguese/English in the case of Brazil) in the ENR section of the corresponding AIP and/or on the website of the air navigation service provider.

4.27 States should report the status of their contingency planning to the ICAO SAM Regional Office, as follows:

1. Promulgation of the national ATS contingency plan, together with the hyperlink to the website of the plan, or a copy of the approved contingency plan;

2. State contingency points of contact; and

3. Establishment of contingency arrangements with each neighbouring State.

Note 1: Information of a confidential or sensitive nature, such as that relating to matters of national security, need not be included in published contingency plans.

Note 2: The regional list of points of contact (Phone Tree) is provided in ***Appendix F***.

4.28 States should notify the ICAO Regional Office and GREPECAS of the status of implementation of the performance expectations of their ATS contingency plan at least once a year, no later than 31 March each year.

5.- RESEARCH AND FUTURE DEVELOPMENT

5.1 To develop a Level 3 Plan for the SAM Region, estimated to start in 2022, consideration should be given to strategic implementation for the publication and activation of trajectory options through multilateral collaborative design, and publication in the AIP of contingency routes for avoidance of airspace affected by Type A contingency events or closed by Type C contingencies, using the required navigation performance specifications RNP 2 or RNP 4, or more efficient specifications that may become available.

Note: The decision to either cross or avoid airspace affected by Type A contingency events is up to the airspace user.

5.2 The capability to implement interconnected tactical ATFM measures should be developed to manage access to type A contingency airspaces and regulate traffic flows to avoid those airspaces affected by Type B or C contingency events.

>>>>>>>>>>>>

APPENDIX A: GLOSSARY OF TERMS

For the purpose of this document, the following terms are considered:

- ✓ ATS CONTINGENCY PLAN: document containing provisions and procedures to be adopted during a contingency in order to maintain safe and orderly air traffic flow and continuity in the provision of air traffic services.

- ✓ ATS CONTINGENCY: temporary and unexpected operational scenario caused by total or partial disruption or potential disruption of air traffic services.

- ✓ ATS DISRUPTION:

  - Total disruption (or ZERO ATS): operational scenario where no air traffic service can be provided.
  - Partial disruption: operational scenario where the routine provision of ATC service is not possible and/or where only flight information and/or alert services can be provided.

✓ TYPE OF CONTINGENCY: set of criteria by which an ATS contingency is classified and, by virtue of this, certain procedures and contingency measures are implemented to deal with said situation.

✓ FLIGHT LEVEL ALLOCATION SCHEME (FLAS): procedure by which, in an ATS contingency, specific flight levels are assigned to certain route segments within a simplified route network in order to maintain the necessary lateral and vertical separation between aircraft.

✓ CENTRAL COORDINATING COMMITTEE (CCC): a committee established in a State to draft, maintain, activate and implement ATS contingency plans.

✓ OPERATIONAL CONTINGENCY GROUP (AOCG): group established and convened by the CCC to oversee operations related to the contingency, for the duration of the latter.

>>>>>>>>>

APPENDIX B: ATS CONTINGENCY PLANNING PRINCIPLES

1. All ATS units, including ATC sectors, units, centres and flight information and reporting offices that support them, should have Level 1 and Level 2 contingency plans to ensure the safe flow of international traffic in the event of total or partial ATS disruption, or unsafe airspace conditions, such as volcanic ash cloud, nuclear emergency or national security responses.

2. The overriding principle is that safety takes precedence over efficiency and optimal levels and routes.

3. Contingency operations will require lower than normal airspace capacity to ensure safety.

4. System and ATC service redundancy is the most effective contingency capability.

5. All contingency plans should define the following, where applicable:

- a contingency route structure, supported by a flight level allocation scheme (FLAS) and minimum navigation and height-keeping capability (*e.g.*, RVSM or non-RVSM) for access;

  Note: Contingency Route Structures and/or FLAS need not be defined where the Contingency Plan states that all routes and/or levels remain available during contingency operations.

- provisions for tactical definition and coordination of additional routes/FLAS and priority of access to accommodate selected non-scheduled operations such as humanitarian, medical evacuation and flood and fire relief (FFR) flights;

- priority determination for routine scheduled and non-scheduled flights;

- flights excluded from operations in contingency airspace, and minimum navigation and height-keeping (RVSM) capability required for access to the contingency airspace;

- specified minimum longitudinal spacing between consecutive aircraft entering the contingency airspace or non-separated ATS contingency routes;

- contingency communication arrangements including means of communication within contingency airspace and communication transfer arrangements for aircraft entering and leaving the airspace;

- details of delegation of air traffic service arrangements (if any); and

- Contingency points of contact.

6. Level 2 contingency arrangements (arrangements between adjacent administrations) should be included in bilateral or multilateral agreements between States in all cases where activation of any Level 1 contingency plan will impact the ATS of a neighbouring State.

7. Level 1 Contingency Plans should include, either in detail or by reference, any relevant Level 2 contingency arrangements.

8. For the purpose of activating the contingency plans due to malfunction or failure of CNS and/or automation systems supporting the ATS unit, pre-activation processes should be provided for gradual establishment of technical degradation levels leading to the activation of the contingency plan.

> *Note. - By way of reference to the application of the concept of technical degradation, an extract from the 2018 Brazilian Air Force Directive is shown as an attachment at the end of this part, which, in its section 3, stipulates a degradation plan and phased implementation of measures in the case of ACCs.*

9. Close cooperation between neighbouring administrations, together with supporting mechanisms for the tactical definition and promulgation of contingency routes for the avoidance of Type B and C contingency airspace.

10. Collaborative air traffic flow management measures should be the first priority response to Type A contingency events, and for the management of deviating traffic during Type B and C events.

11. Contingency routes should be vertically separated whenever lateral route separation is less than the minimum specified by the State for contingency operations.

12. Contingency flight level allocation scheme planning should contemplate the allocation of optimum flight levels to routes used by long haul aircraft, depending on the traffic density on the route, wherever practicable.

13. Contingency ATS routes should provide minimum lateral separation of 100 NM between aircraft that are not vertically separated under a FLAS.

14. The longitudinal separation between aircraft during contingency periods shall be stipulated in the plans of each State, providing that the affected ATS may have the power to relax these limitations as it benefits safety and/or reduces the workload on the affected ATS unit and taking into account airspace volume and complexity, airspace sectors, service capacity limitations, staff availability, etc. The State should also assess the impact of such separations on air operations, and avoid the application of longitudinal separation at points of entry to the FIR "regardless of flight level", as this would mean disregarding the vertical aircraft separation method prescribed in Doc 4444 PANS ATM.

States will determine the minimum longitudinal separation between aircraft operating on the same path and/or contingency route and not vertically separated. This separation shall be expressed in terms of time or distance between aircraft, based on the following options/schemes applicable in oceanic and/or continental airspace:

a) 15 minutes or 120 NM. However, this may be reduced to 10 minutes or 80 NM in conjunction with application of the Mach number technique where authorised by the aeronautical authority and agreed in the corresponding letter of agreement (LoA) or other contingency arrangement;

b) 10 minutes or 80 NM (taking into account the performance of aircraft operating in the region, the vast majority of which are PBN-certified and are equipped with TCAS/ACAS systems). However, this separation may be extended to 15 min or 120 NM after coordination between the FIRs involved or as agreed in the corresponding letter of agreement (LoA) or other contingency arrangement;

15. Contingency ATS routes and FLAS, as well as contingency procedures, should be agreed between geographically grouped neighbouring States to generate sub-regional contingency plans.

16. Contingency ATS routes should be published in the State AIP to permit storage of route details in airspace users' navigation databases.

17. States making temporary changes in airspace classification during ATS contingencies should include in the corresponding regulations the operational, technical and/or legal criteria for the implementation of changes in airspace classification. Likewise, provisions on this matter should be included in the letters of operational agreement with adjacent States.

18. Define ground and airborne navigation requirements if necessary.

19. Alternate aerodromes should be specified where necessary in Level 1 contingency plans for airport control towers and terminal airspace.

20. Aircraft operators are required by ICAO Annex 6 – *Operation of Aircraft* to implement appropriate mitigation measures for volcanic ash in accordance with their safety management system (SMS), as approved by the State of the Operator/Registry.

21. Airspace affected by volcanic ash cloud should not be closed to international civil aviation.

22. Amended ATS routes, whether published or specifically promulgated, may be prescribed as part of the air traffic flow management (ATFM) response to expected demand and capacity imbalance caused by aircraft avoiding the volcanic ash cloud.

23. Aerodromes should only be closed by NOTAM for periods of observed volcanic ash contamination of the surface of the aerodrome movement area.

24. Closure of airports affected by volcanic ash deposition should be supported by a safety assessment conducted in collaboration between airport operator, aircraft operators and the air navigation service provider, in accordance with their respective safety management systems.

ATTACHMENT

Excerpt from Directive DCA 63-1 / free translation from Portuguese into English

DCA 63-1 (Air Force Command Directive) – Year: 2018
DEGRADATION PLAN, REGIONAL EMERGENCY PLAN
AND CONTINGENCY PLAN

1 PRELIMINARY PROVISIONS

1.1 PURPOSE

The purpose of this publication is to establish guidelines regarding the Degradation Plan, the Regional Emergency Plan and the National Contingency Plan, in order to ensure safety, the operation of air traffic

and aeronautical telecommunication services, as well as aircraft flow, in situations of degradation, crisis, social instability or disruption of various supporting services.

1.2 SCOPE
The provisions of this publication must be followed by all SISCEAB bodies.

1.3 RESPONSIBILITY
It is the responsibility of each body, as defined in this publication, to draw up, disseminate, update and activate/execute the Degradation Plan, Regional Emergency Plan and National Contingency Plan, with the aim of maintaining the safety, regularity and efficiency of the services provided by SISCEAB.

2 ABBREVIATIONS AND CONCEPTS

2.1 ABBREVIATIONS

ACAMS - Airport control and monitoring system
CCAM - Automatic message switching centre
CGNA - Air navigation management centre
CINDACTA - Integrated air defence and air traffic control centre
DCA - Air Force Command directive
DCL - Departure clearance (data link service)
DECEA - Airspace control department
DTCEA - Airspace control unit
MOP - Operational model
PAME - Aeronautical electronics equipment
RACAM - Administrative network for automatic message switching
SDAD - DECEA administration subdepartment
SDOP - DECEA operations subdepartment
SDTE - DECEA technical subdepartment
SISCEAB - Brazilian Airspace Control System
SGTC - Control tower management system
SRPV - Regional flight protection service
TARIS - Synthetic image radar display terminal
TATIC - Total air traffic information control

2.2 CONCEPTS

For the purpose of this publication, the following concepts are used:

DEGRADATION PLAN. - A document defining the procedures to be adopted in case of failure of the power, telecommunications and surveillance systems, as well as in consoles, air navigation procedures and others, in order to minimise the impact on the provision of air traffic services.

> NOTE: Aeronautical telecommunication systems comprise the following aeronautical services: radio navigation (*e.g.,* DME, VOR, etc.), mobile (VHF, DCL, etc.), fixed (AMHS / CCAM, RACAM, etc.) and broadcasting (ATIS, VOLMET, etc.).

3 DEGRADATION PLAN

3.1 OBJECTIVE

Define actions and procedures to minimise the operational impact on the provision of air traffic services by an ATS organization due to failures in its electrical, telecommunication and surveillance systems, as well as in consoles, air navigation procedures and others.

3.2 RESPONSIBILITY

3.2.1 It is the responsibility of the head of the ATS to propose the inclusion of the respective Degradation Plan in the MOP.

3.3 ACTIVATION

The Degradation Plan will define the circumstances and steps for activation to the responsible parties, as approved by the respective head of the ATS.

3.4 STRUCTURE

3.4.1 The Degradation Plan should include, where appropriate, at least the aspects described in the following sub-topics, regardless of the sequence of occurrence.

NOTE: To better understand and support the decision of service teams, the Degradation Plan should also provide a brief description of the mode of operation of the main systems available, in case of failure of primary, secondary and alternate systems.

3.4.1.1 In case of failure of primary (commercial) and/or secondary (batteries, generator, etc.) power, provide for:

a) immediate activation of relevant technical support;
b) assessment of the impact on agency services;
c) actions and alternative means to address the power outage;
d) the need to turn off equipment that is not being used;
e) information on the degradation to adjacent ATS units and CGNA; and
f) information on the end of degradation to local bodies, adjacent ATS units and CGNA.

3.4.1.2 In case of failure of the aeronautical mobile service, provide for:

a) immediate activation of relevant technical support;
b) assessment of the operation of secondary frequencies;
c) actions and alternative means to address communication failures in the main and secondary frequencies;
d) implementation of regulatory communications contingency procedures related to:
- total failure of ground radio equipment;
- blocked frequency; and
- false and misleading transmissions on frequencies.
e) determination of a reduction in ATS capacity;
f) tactical flow management procedures;
g) information to adjacent ATS units and CGNA; and
h) information on return to normal service to local agencies, adjacent ATS units and CGNA.

3.4.1.3 In case of failure of the aeronautical fixed service, provide for:

a) immediate activation of relevant technical support;
b) assessment of the operation of the secondary voice communication system;
c) actions and alternative means to address communication failures in primary and secondary voice communication systems;

d) actions and alternative means to address the discontinuity in the exchange of ATS messages (loss of AMHS, CCAM, etc.);
e) determination of a reduction in ATS capacity;
f) tactical flow management procedures;
g) information to adjacent ATS units and CGNA; and
h) information on the return to normal service to local agencies, adjacent ATS units and CGNA.

3.4.1.4 In case of failure of surveillance systems (radar, console, ADS, cameras, etc.), provide for:
a) activation of relevant technical support;
b) use of other available operational positions;
c) increased separation values, in cases of maintenance of the ATS surveillance service;
d) exceptional application of emergency separation;
e) procedures for transition to conventional control and circulation;
f) maximising conventional control capacity;
g) suspension of authorisation of certain local air operations (for example, special VFR, etc.);
h) cancellation of issuance of standard authorisations;
i) discontinuation of routes, procedures, airspace reservations and restrictions, for which the provision of ATS surveillance services is a necessary condition;
j) procedures for accepting traffic transfers from adjacent agencies;
k) procedures for requesting transfer of traffic to adjacent units;
l) procedures to improve the operational monitoring function;
m) information to aircraft about the loss of the surveillance service;
n) coordination with all the local bodies involved;
o) reduction of ATS capacity values;
p) tactical flow management procedures;
q) information to adjacent ATS units and CGNA;
r) prioritisation of flights in coordination with CGNA; and
s) information on the return to normal service to local agencies, adjacent ATS units and CGNA.

NOTE: Cameras can be essential for the provision of ATC in parts of the manoeuvring area where the TWR has no direct visual contact or even in the case of a remote tower (R-TWR).

3.4.1.5 In case of failure of ATS procedures, provide for:

a) information to aircraft on the suspension of procedures affected by degradation (for example, PBN, RVSM, etc.);
b) obtaining possible solutions from relevant professionals, mainly in case of damage due to technical or meteorological obstacles;
c) coordination with all local and adjacent bodies involved;
d) coordination for the dissemination of suspension of ATS aerodrome procedures through ATIS and/or NOTAM, if applicable;
e) reduction of ATS or aerodrome capacity values;
f) tactical flow management procedures;
g) information to adjacent ATS units and CGNA; and
h) information on return to normal service to local agencies, adjacent ATS units and CGNA.

3.4.1.6 In case of failure of air navigation aids, provide for:

a) information to aircraft on the suspension of procedures/routes affected by failure of air navigation aids;
b) coordination with all local bodies involved;

c) coordination for the dissemination of suspension of air navigation procedures through ATIS and/or NOTAM, if applicable;
d) reduction of ATS or aerodrome capacity values;
e) tactical flow management procedures;
f) information to adjacent ATS units and CGNA; and
g) information on return to normal service to local agencies, adjacent ATS units and CGNA.

3.4.1.7 In case of failure of other systems of the ATS unit (or their integration)

3.4.1.7.1 Where appropriate, provide for procedures for ATS personnel to address failures in information systems (MET, AIS, infrastructure, monitoring, database, etc.), flight progress management (SGTC, TATIC, ACAMS, etc.), surface surveillance, landing / take-off management, radar image repeater (TARIS, etc.)), data link (DCL, CPDLC, etc.), air conditioning and lighting of ATS bodies, as well as corporate networks and certain equipment such as the aerodrome rotating beacon, aeronautical lights and surface cameras.

3.4.1.7.2 If such failures can affect aircraft flow, the Degradation Plan must also include:

a) coordination with all the local bodies involved;
b) tactical flow management procedures;
c) information to adjacent ATS units and CGNA; and
d) after the system/equipment has been restored, information on the return to normal service to local agencies, adjacent ATS units and CGNA.

3.4.1.8 The degradation procedures that provide for the transfer, in whole or in part, of communications and/or control to another ATS unit must be previously established in a letter of operational agreement between the entities concerned. These procedures, if any, must be transcribed or at least mentioned in the ATS degradation plan.

3.4.2 In addition to the provisions set forth in 3.4.1, the degradation plan of area control centres must contain a set of gradual measures, established in 6 (six) phases, from 0 to 5. However, the implementation of any of the measures, except those of phase 2, may be immediate if the situation of degradation so requires.

3.4.2.1 Phases 1, 2, 3, 4 and 5 correspond to the incremental implementation of adjustments or restrictions to aircraft flow related to the worsening inoperability of technical systems and/or operational difficulties, resulting in a reduced capacity to provide ATC.

3.4.2.2 Phase 0 - Occurs when there is degradation of systems and procedures, offset by redundancies in other systems and procedures available in the unit, and no adjustment or restriction to aircraft flow is required.

3.4.2.3 Phase 1 - Includes measures with little impact on aircraft flow. It results, for example, in rerouting and speed control measures in order to make adjustments and allow traffic to flow.

3.4.2.4 Phase 2 - It is characterised by the adoption of restrictive measures, with the designation of specific flight levels to ensure vertical separation of traffic, even before entering the degraded sector. Phase 2 measurements will be used only after Phase 1.

3.4.2.5 Phase 3 - It is characterised by the progression of restrictive measures, increasing time/distance spacing of traffic and/or rerouting certain traffic.

3.4.2.6 Phase 4 - Involves implementation of additional restrictive measures to further reduce the volume of traffic in a control sector, for example, interrupting take-offs from certain feeder aerodromes and/or making large en-route deviations.

3.4.2.7 Phase 5 - The adoption of the most severe restrictive measures will occur when the degradation of material and/or human resources is such that the provision of the ATC service is practically impossible. This phase will guide the total or partial suspension of traffic flow, and the activation of the national contingency plan for the FIR concerned must be coordinated with CGNA.

NOTE: The total or partial suspension of vehicle flow due to a degradation condition is an extremely severe measure, and every effort should be made to solve the original problem in order to restore vehicle flow as soon as possible.

3.4.3 Any case of degradation should be described in the ATS ATL.

3.5 UPDATING

3.5.1 The degradation plans of ATS units, contained in the respective MOP, shall be reviewed and compulsorily republished, once every two years or in a shorter period, when necessary, especially when new concepts, services, systems, procedures, equipment and/or assistance that may affect the HTA are implemented.

NOTE: The two-year period mentioned in this item is from the date of approval of the current MOP.

3.6 DISSEMINATION

Degradation plans containing procedures to be carried out by adjacent ATS units must be mutually known and defined in an operational letter of agreement.

>>>>>>>>>

APPENDIX C: BASIC PLAN ELEMENTS

Element 1: Administration

a) Record of signatories, version control and record of amendments.

b) Definition of the objectives, applicable airspace and operations, and exclusions.

Element 2: Plan management

c) List of States and FIRs affected, and the agreed methods of notification in the event of pre-activation, activation and termination of the plan, as follows:

- Pre-activation phase: includes immediate or short-term actions aimed at ensuring the safety of aircraft affected by the contingency and safeguarding the physical integrity of ATC personnel who may be affected by the contingency;
- Activation phase: medium- and long-term actions to maintain a safe and orderly flow of air traffic compatible with contingency conditions;
- Termination phase: actions upon termination of the contingency with a view to restoring service levels and traffic order as soon as possible, without jeopardising the safety of operations.

Note 1.- Contingency events may arise without allowing sufficient time for pre-activation of contingency plans.

Note 2.- Termination of the contingency plan should provide for the issuance of a NOTAM and simultaneous communication by e-mail or telephone (ensuring acknowledgement of receipt) to stakeholders, including the CST, adjacent ACCs, national authorities, ICAO Regional Office, etc.

d) Details of the arrangements in place for management of the plan, including:

i. Provisions for the establishment of a central coordinating committee to authorise and oversee the activation of the plan and arrange for ATS restoration in case of an extended outage;

ii. ATS operational contingency group for 24-hour coordination of the operational and support activities under the plan; and

iii. The terms of reference, structure and contact details for each.

e) Details of testing, review and reporting actions:

i. Schedule of desktop and simulator testing;

ii. Post-activation review (PAR) requirements:

- Completion of a preliminary PAR report within 28 days of any

activation or testing of contingency plans, including any recommendations to address deficiencies and introduce improvements in contingency plans, arrangements, procedures and training.

- A more comprehensive PAR report should be prepared for major contingency events, or any contingency event involving a safety incident investigation.

  A full PAR analysis of major events could take several months to complete.

- Input to the PAR from all parties affected or involved in the response to the contingency is actively sought and considered;

- Bilateral or multilateral PARs for activation or testing of Level 2 contingency arrangements; and

iii. Timely reporting to ICAO and other affected States of anticipated or experienced disruptions requiring activation of contingency plans.

Note: Annex 11 states that: States anticipating or experiencing disruption of air traffic services or related supporting services should advise, as early as practicable, the ICAO Regional Office and other States whose services might be affected. Such advice should include information on associated contingency measures or a request for assistance in formulating contingency plans.

f) Inclusion of contingency plans/procedures in ATS training and refresher training courses.

Element 3: Airspace

g) Procedures and determinants for implementation and activation of special use airspace including, where necessary, restricted or prohibited areas in territorial airspace, or danger areas over the high seas.

Note.- The State could decide to suspend any activation or restriction of reserved areas during the contingency.

h) Criteria for making changes to airspace classification and the associated separation and CNS requirements.

i) Collaborative trajectory options for Type A, B and C events, and for large scale weather deviations (LSWD).

Element 4: ATS procedures

j) Details of rerouting to avoid the whole or part of the airspace concerned, normally involving establishment of:

i. strategic and tactical collaborative trajectory options providing additional routes or route segments with associated conditions for their use; and/or

ii. a simplified route network through the airspace concerned, together with a flight level allocation scheme, to ensure that a standard vertical separation minimum is applied where less than the specified lateral separation minimum exists between routes.

k) Details of how domestic traffic, departing and arriving flights, and SAR, humanitarian and State aircraft flights will be managed during the contingency period.

l) Procedures for transition from normal service levels to contingency services, and resumption of normal service.

m) Procedures for joining or departing a contingency route.

n) Details of reduced levels of service, if any, within the affected airspace.

o) Establishment of arrangements for controlled access to the contingency area to prevent overloading of the contingency system, using assigned airspace entry times or, where ATFM capability exists, tactical ATFM measures.

p) Procedures for adjacent service providers to establish longitudinal spacing at the point of entry, and issuance of coordinated measures to ensure such separation is maintained throughout the affected airspace.

q) Reassignment of responsibility for the provision of air traffic services, to the extent possible, in non-sovereign airspace and to international aircraft traversing sovereign airspace.

r) Coordination and communication transfer procedures for aircraft entering and leaving the affected airspace.

Element 5: Pilot/operator procedures

s) Requirements for flight plan submission during the contingency period, including contingency route planning requirements, and arrangements if airspace is restricted or not available and no contingency route is available.

t) Emergency procedures, including in-flight requirements for broadcasting position and other information, and for continuous listening watch, on specified pilot-pilot and watch very high frequencies.

u) Requirements for display of navigation and anti-collision lights.

v) Requirements for climbing and descending well to the right of the centreline of specifically identified routes.

w) Requirements for all operations to be conducted in accordance with IFR, including operating at IFR flight levels from the Table of Cruising Levels in Appendix 3 to

Annex 2 - *Rules of the Air*, except where modified by a flight level allocation scheme.

Element 6: Communication facilities and procedures

x) Provision and operation of appropriate air-ground communications, aeronautical fixed telecommunication network (AFTN) and ATS direct speech links.

y) Specification of radio frequencies to be used for particular contingency routes.

z) Access and connection management for aircraft equipped with controller-pilot data link communications (CPDLC), where appropriate.

aa) Use of automatic dependent surveillance - Contract (ADS-C) automatic position reporting instead of voice position reporting to ATS.

Element 7: Aeronautical support services, including AIS (AIM), NOTAM, and MET

bb) Information in the AIP regarding contingency planning, and notification by ASHTAM/NOTAM of anticipated or actual disruption of air traffic services and/or supporting services, including associated contingency arrangements, as early as practicable and, in the case of foreseeable disruption, not less than 48 hours in advance.

cc) Reassignment to adjacent States of the responsibility for providing meteorological information and information on status of navigation aids.

Element 8: Contact details

dd) Contact details of the RCC responsible for the affected FIR, and coordination arrangements.

ee) Contact details of ANSPs of adjacent States and other international organisations participating in the contingency plan.

ff) Prior notification requirements for activation of Level 2 contingency arrangements in adjacent FIRs.

Note: The first priority response to any short-notice contingency should be the immediate handling of the situation in the air, followed by the activation of the contingency plan.

APPENDIX D: CONTINGENCY PLAN TEMPLATE

ATS CONTINGENCY PLAN FOR THE [XXXX] CTA/UTA/FIR

OBJECTIVE

1. This contingency plan contains arrangements to ensure the continued safety of air navigation in the event of a partial or total disruption of air traffic services (ATS), and is related to ICAO Annex 11 - *Air Traffic Services*, Chapter 2, paragraph 2.28. The contingency plan should be designed to provide alternate routes, using mostly existing airways, which will allow aircraft operators to cross or avoid airspace within the (XXX) control area (CTA)/upper control area (UTA)/FIR.

AIR TRAFFIC MANAGEMENT

ATS Responsibilities

2. ATC tactical considerations during periods of overload may require reallocation of routes or route segments.

3. Alternate routes should be designed to maximise the use of existing ATS route structures and communication, navigation and surveillance services.

4. In the event that ATS cannot be provided in the (XXXX) CTA/UTA/FIR, the civil aviation authority (CAA) [or ANSP, as appropriate] shall publish the corresponding NOTAM/ASHTAM, indicating the following:

   a) time and date of the beginning of the contingency measures;
   b) airspace available for landing or overflying traffic, and airspace to be avoided;
   c) details of the facilities and services available or not available, and any limits on ATS provision (*e.g.,* ACC, APP, TWR and FIS), including an expected date of restoration of services if available;
   d) information on provisions made concerning alternative services;
   e) ATS contingency routes;
   f) procedures to be followed by adjacent ATS units;
   g) procedures to be followed by pilots; and
   h) any other details with respect to the disruption and actions being taken that aircraft operators may find useful.

5. In the event that the CAA [or ANSP, as applicable] is unable to issue the NOTAM, the (alternate) CTA/UTA/FIR will take action to issue the NOTAM, within the framework of the LoA or Memorandum of Understanding (MoU) with another State/ANSP or international organisation, advising of airspace and service limitations, upon receipt of notification from the relevant CAA [or ANSP, as applicable] or ICAO Regional Office.

Separation

6. Aircraft separation criteria applied will be in accordance with the *Procedures for Air Navigation Services-Air Traffic Management* (Doc 4444) and the *Regional Supplementary Procedures* (Doc 7030).

Level restrictions

7. Where possible, aircraft on long-haul international flights will be given priority for cruising levels.

Other measures

8. Other measures related to airspace closure and the implementation of the contingency scheme in the (XXX) CTA/UTA/FIR may be adopted as follows:

a) suspension of all VFR operations;
b) delay or suspension of IFR operations by general aviation; and
c) delay or suspension of IFR commercial operations.

TRANSITION TO THE CONTINGENCY SCHEME

9. During times of uncertainty, when airspace closures seem possible, aircraft operators should be prepared for possible rerouting while en-route, be familiar with the alternate routes outlined in the contingency scheme, as well as what may have been promulgated by a State via NOTAM, aeronautical information circular (AIC), supplement (SUP) or AIP.

10. In the event of airspace closure that has not been promulgated, ATC should, if possible, broadcast to all aircraft in their airspace, what airspace is being closed and to stand by for further instructions.

11. ATS providers should be aware that when airspace or airport closures are promulgated, individual airlines might have different company requirements as to their alternate routings. ATC should be alert to respond to any request by aircraft and react commensurate with safety.

TRANSFER OF CONTROL AND COORDINATION

12. Transfer of control and communication between ATS units should take place at the common FIR boundary, unless there is a mutual agreement between adjacent ATS units. ATS providers should also review existing coordination requirements in light of contingency operations or closure of airspace at short notice.

PILOT AND OPERATOR PROCEDURES

13. Pilots must be aware that, as a result of current international circumstances, a contingency routing requiring aircraft to operate off normal traffic flows may result in interception by military aircraft. Aircraft operators must therefore be familiar with international intercept procedures contained in ICAO Annex 2 –*Rules of the Air*, paragraph 3.8 and Appendix 2, Sections 2 and 3.

14. Pilots must continuously watch the VHF emergency frequency 121.5 MHz and should activate their transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where secondary surveillance radar (SSR) is used for ATS purposes. Transponders should be set on a discrete code assigned by ATC or select code 2000 if no code has been assigned.

15. If an aircraft is intercepted by another aircraft, the pilot shall immediately:

a) comply with instructions given by the intercepting aircraft, interpreting and

responding to visual signals, in accordance with international procedures;

b) if possible, notify the corresponding ATS unit;

c) attempt to establish radio communication with the intercepting aircraft by making a general call on the emergency frequency 121.5 MHz and 243 MHz, if equipped; and

d) set the transponder to code 7700, unless instructed otherwise by the corresponding ATS unit.

16. In case some of the instructions received by radio from any source are in contradiction with those given by the intercepting aircraft, the intercepted aircraft shall request immediate clarification while continuing to comply with the instructions given by the intercepting aircraft.

OVERFLIGHT APPROVAL

17. If necessary, aircraft operators should obtain overflight approval from States for operating flights within their airspace jurisdiction. In a contingency situation, flights may be rerouted at short notice, and operators may not be able to give the required advance notice in a timely manner to obtain approval. States responsible for the airspace in which contingency routes are established should consider establishing special arrangements to facilitate the approval of flights under these contingency situations.

ATS OPERATIONAL CONTINGENCY GROUP (AOCG)

18. The AOCG that has been assigned responsibility for monitoring events and that can order the execution of the contingency plan and the coordination of contingency arrangements is:

Name of entity:
Contact person:
Cell/mobile phone:
E-mail:

19. During a contingency situation, the AOCG will liaise with adjacent ATS units through the ICAO Regional Office.

20. The ICAO Regional Office will:

a) monitor the situation closely and coordinate with all States concerned and the IATA Regional Office, in order to ensure the provision of air navigation services to international aircraft operations in the SAM Region;

b) take note of any incidents reported and take appropriate action;

c) provide the required assistance in relation to any problems with the civil aviation administrations involved in the contingency plan; and

d) keep the President of the ICAO Council, Secretary General, C/RAO, D/ANB and C/ATS constantly informed about events, including the activation of the

contingency plan.

CONTINGENCY ALTERNATE ROUTE SCHEME

21. Aircraft operators should submit their flight plans using the contingency alternate routes listed in the scheme below in order to operate in the airspace under the jurisdiction of (XXX).

Existing ATS route	**CONTINGENCY ALTERNATE ROUTES**	**FIR INVOLVED**
Instead of:	**(ATS unit)** provides ATC on the following routes: ***R1:*** ***R2:*** ***R3:***	**XXX**: In coordination with **XXX**
Instead of:	**(ATS unit)** provides ATC on the following route: ***R4:***	**XXX**: In coordination with **XXX**

Optionally, this table can be prepared based on the characteristics of existing flows between FIRs or between city pairs, according to the following model:

Existing ATS route	**CONTINGENCY ALTERNATE ROUTES**	**FIRs INVOLVED**
Flow from X FIR to Y FIR	**(ATS unit)** provides ATC on the following routes: ***R1:*** ***R2:*** ***R3:***	**XXX**: In coordination with **XXX**
Flow from CITY G to CITY W	**(ATS unit)** provides ATC on the following route: ***R4:***	**XXX**: In coordination with **XXX**

22. All aircraft should establish and maintain contact with the (XXX) (APP/ACC/FIC) ATS unit responsible for the airspace they are crossing, on the published VHF or HF frequencies.

List of points of contact of all States involved, IATA and ICAO Regional Office

State /International organisation	***Point of contact (name and/or position /designated job title)***	**Cell/mobile phone**	**E-mail**

IATA			
ICAO (Regional Office)			

<<<

23. The following is a NOTAM model for the ZERO ATS situation, presented in English according to the plain language standards set forth in Annex 15.

Note. - The ATS and AIS/AIM units issuing this NOTAM shall analyse the feasibility of transmitting a long message like the one shown in the model, given some limitations in the number of characters inherent in AFTN systems.

NOTAM MODEL FOR ZERO ATS

Debido a total interrupción de los servicios de tránsito aéreo, el Plan de Contingencia ha sido activado dentro de la FIR FANTASY (SFAN).

Due to total disruption of air traffic services, the contingency plan has been activated within the FANTASY FIR (SFAN).

A0087/20 NOTAMN

Q) SFAN/QCAAS/IV/B/AE/000/999

A) SFAN

B) 200401 1345

C) 200403 2359 EST

E) FOR MORE INFORMATION AND FLIGHT PLANNING, SEE THE SIMPLIFIED ROUTE NETWORK AND OPERATING PROCEDURES OF FANTASY FIR CONTINGENCY PLAN, PUBLISHED IN AIP FANTASY, PART ENR 6.6 AND ALSO IN THE FOLLOWING WEBSITE: WWW.FANTASYCAA.GOB.FAN

ATS ROUTES WITHIN FANTASY FIR ARE RECLASSIFIED AS CLASS G AIRSPACE, ONLY FIS AND ALR SERVICES AVBL. PILOTS MUST APPLY THE FOLLOWING:

1. INCLUDE IN THE LAST POSITION REPORT TO THE ADJACENT ACC THE ESTIMATED TIMES OVER ENTRY AND EXIT POINTS OF FANTASY FIR

2. THE AIRCRAFT MUST APPLY STRATEGIC LATERAL OFFSET PROCEDURES (SLOP) TO THE RIGHT OF THE CENTER LINE RELATIVE TO THE DIRECTION OF FLIGHT IN TENTHS OF A NAUTICAL MILE UP TO A MAXIMUM OF 0.5 NM.

3. KEEP THE NAVIGATION AND ANTI-COLLISION LIGHTS PERMANENTLY TURNED ON WHILE OPERATING IN THE FANTASY FIR;

4. KEEP THE TRANSPONDER ON AND SET ON CODE 2000, IF NO OTHER SSR CODE HAS BEEN ASSIGNED;

5. TRAFFIC INFORMATION BROADCASTS BY AIRCRAFT (TIBA) IN VHF FRECUENCY 121.5 MHZ.

5.1. WHEN THE AIRCRAFT HAS ONLY TWO SERVICEABLE VHF SETS, ONE SHOULD BE TUNED TO THE APPROPRIATE ATS FREQUENCY AND THE OTHER TO THE TIBA FREQUENCY 121.5 MHZ.

5.2. A LISTENING WATCH SHOULD BE MAINTAINED ON THE TIBA FREQUENCY 10 MINUTES BEFORE ENTERING THE FANTASY FIR UNTIL LEAVING THIS AIRSPACE. FOR AN AIRCRAFT TAKING OFF FROM AN AERODROME LOCATED WITHIN THE LATERAL LIMITS OF THE FANTASY FIR, LISTENING WATCH SHOULD START AS SOON AS APPROPRIATE AFTER TAKE-OFF AND BE MAINTAINED UNTIL LEAVING THE AIRSPACE.

5.3. A BROADCAST SHOULD BE MADE:

A. 10 MINUTES BEFORE ENTERING THE FANTASY FIR OR, FOR A PILOT TAKING OFF FROM AN AERODROME LOCATED WITHIN THE LATERAL LIMITS OF THE FANTASY FIR, AS SOON AS APPROPRIATE AFTER TAKE-OFF;
B. 10 MINUTES PRIOR TO CROSSING A REPORTING POINT;
C. 10 MINUTES PRIOR TO CROSSING OR JOINING AN ATS ROUTE;
D. AT 20-MINUTE INTERVALS BETWEEN DISTANT REPORTING POINTS;
E. 2 TO 5 MINUTES, WHERE POSSIBLE, BEFORE A CHANGE IN FLIGHT LEVEL;
F. AT THE TIME OF A CHANGE IN FLIGHT LEVEL; AND
G. AT ANY OTHER TIME CONSIDERED NECESSARY BY THE PILOT.

5.4. THE BROADCAST SHALL CONTAIN AIRCRAFT IDENTIFICATION, POSITION, ABANDONED LEVEL, CROSSING LEVEL AND ANY OTHER RELEVANT INFORMATION; THE BROADCASTS SHOULD NOT BE ACKNOWLEDGED UNLESS A POTENTIAL COLLISION RISK IS PERCEIVED.

5.5. RELATED OPERATING PROCEDURES:

CRUISING LEVEL CHANGES SHOULD NOT BE MADE, UNLESS CONSIDERED NECESSARY BY PILOTS TO AVOID TRAFFIC CONFLICTS, FOR WEATHER AVOIDANCE OR FOR OTHER VALID OPERATIONAL REASONS.

WHEN CRUISING LEVEL CHANGES ARE UNAVOIDABLE, ALL AVAILABLE AIRCRAFT LIGHTING WHICH WOULD IMPROVE THE VISUAL DETECTION OF THE AIRCRAFT SHOULD BE DISPLAYED WHILE CHANGING LEVELS.

IF, ON RECEIPT OF A TRAFFIC INFORMATION BROADCAST FROM ANOTHER AIRCRAFT, A PILOT DECIDES THAT IMMEDIATE ACTION IS NECESSARY TO AVOID AN IMMINENT COLLISION RISK, AND THIS CANNOT BE ACHIEVED IN ACCORDANCE WITH THE RIGHT-OF-WAY PROVISIONS OF ICAO ANNEX 2, THE PILOT SHOULD:

A. UNLESS AN ALTERNATIVE MANOEUVRE APPEARS MORE APPROPRIATE, IMMEDIATELY DESCEND 150 M (500 FT), OR 300 M (1 000 FT) IF ABOVE FL 290 IN AN AREA WHERE A VERTICAL SEPARATION MINIMUM OF 600 M (2 000 FT) IS APPLIED;

B. DISPLAY ALL AVAILABLE AIRCRAFT LIGHTING WHICH WOULD IMPROVE THE VISUAL DETECTION OF THE AIRCRAFT;

C. AS SOON AS POSSIBLE, REPLY TO THE BROADCAST ADVISING ACTION BEING TAKEN;

D. NOTIFY THE ACTION TAKEN ON THE APPROPRIATE ATS FREQUENCY; AND

E. AS SOON AS PRACTICABLE, RESUME NORMAL FLIGHT LEVEL, NOTIFYING THE ACTION ON THE APPROPRIATE ATS FREQUENCY.

6. AUTO-TRANSFER PROCEDURES

TAKING INTO CONSIDERATION THAT THE FANTASY ACC IS NOT ABLE TO COORDINATE AIR TRAFFIC DUE TO TOTAL INTERRUPTION OF THE ATS THE FOLLOWING AUTO TRANSFERRING PROCEDURES SHALL BE APPLICABLE BY THE PILOT:

A. TRY TO ESTABLISH CONTACT WITH THE ADJACENT ATS FACILITY AT LEAST FIVE (5) MINUTES BEFORE ETO ON THE EXIT REPORTING POINT OF THE FANTASY FIR TRANSFER;
B. INFORM THE ATS UNIT THAT IT IS PERFORMING AN AUTO-TRANSFER; AND
C. TRANSMIT THE FOLLOWING INFORMATION: AIRCRAFT IDENTIFICATION, ORIGIN, DESTINATION, ROUTE, FLIGHT LEVEL, TRANSPONDER CODE, RVSM APPROVAL STATUS AND ESTIMATED TO THE AUTO-TRANSFER REPORTING POINT.

INTENTIONALLY LEFT BLANK

APPENDIX E: TERMS OF REFERENCE OF THE COORDINATION AND SUPPORT TEAM (ECA)

- The Coordination and Support Team brings together States/ANSPs responsible for ATS services adjacent to the State/Administration facing a contingency situation.

- Upon receipt of information on the possible activation, pre-activation or effective activation of an ATS contingency plan, the ICAO South American Regional Office (SAM RO) organises, coordinates and convenes the ECA, through the designated Regional Officer.

- The call is made based on the current list of regional points of contact maintained by the SAM RO, which is validated and/or revised for each call. In general, it is expected that the ECA will consist of officials/heads who can coordinate tactical support by adjacent ATS services and promote collaborative decision-making when required. In addition, representatives of IATA, CANSO, airlines, users, authorities involved in the contingency, ICAO bodies, etc., can be incorporated.

- The concept behind the ECA is to gather reliable information at a single point of collection, coordinate with stakeholders, including ICAO headquarters in Montreal, and support contingency measures implemented by a State/Administration, facilitating the flow of aircraft and reinforcing safety.

- The call is made via official e-mail, and a Call Tree and, if agreed, a communication group in a social network are activated/approved. It is expected that the ECA so convened will operate H24, unless a different schedule is agreed.

- The Team is temporary, and will be dissolved via e-mail when the ATS contingency plan that originated it is terminated.

- The framework of activity of the ECA is the ATS contingency plan of the State/Administration concerned. Likewise, for flexible management of the plan, the ECA coordinates specific tactical actions that may be required for the provision of ATS and helps to mitigate as much as possible the impact of contingency measures on users.

- Furthermore, the ECA monitors the situation in order to keep the operational information concerning the activated plan updated and available.

>>>>>>>>>>>

APPENDIX F: REGIONAL LIST OF POINTS OF CONTACT (PHONE TREE)

Note: The list includes the cell/mobile number of the designated POC officer as a primary means of communication or, alternatively, the cell/mobile number corresponding to the position or designated job title.

(Revision, 4 november 2020)

Argentina Ana Toloza ANAC ARGENTINA + 54 11 6145 9307 atoloza@anac.gob.ar	
Bolivia Jaime Álvarez Director Navegación Aérea - DGAC +591 72043698 jalvarez@dgac.gob.bo	
Brazil Coronel Fabio CGNA BRASIL +55 21 99887-4416 fabiofss@cgna.gov.br	
Chile Juan Carlos Rojas P. Subdepartamento ATS -DGAC +569 8839 5869 jrojasp@dgac.gob.cl Osvaldo Alvarado O. Sección Servicios ATC - DGAC +569 9349 0014 olavaradoo@dgac.gob.cl	
Colombia Bogotá: Coordinador Operativo Centro de Control +57 317 5131694 Bogotá: Coordinador Aeronavegación Regional Cundinamarca +57 316 468 1714	Barranquilla: Coordinador Aeronavegación Regional Atlántico +57 3175171105

Ecuador

Marcelo Valencia
Responsable Gestión ATM
DGAC Ecuador
+593 9860 44550
marcelo_valencia@aviacioncivil.gob.ec

Jorge Zúñiga
Gestión ATM
DGAC Ecuador
+593 9930 67547
jorge.zuniga@avicioncivil.gob.ec

Responsable ACC Guayaquil
DGAC Ecuador
+593 2 2947400 ext 2187
atmacc@aviacioncivil.gob.ec

French Guiana

Guillaume ROBERT
Head of Air Traffic Services – Cayenne ACC
+594 694 916363
guillaume.robert@aviation-civile.gouv.fr

Guyana

Rickford Samaroo
Director Air Navigation Services
+ 592 613 6380 + 592 261 2217
rsamaroo@gcaa-gy.org

Trevor Daly
Unit Chief – Timehri (ACC/APP/TWR/FIC)
+ 592 608 3653 +592 261 2279
tdaly@gcaa-gy.org tl_daly@yahoo.com

Panama

Leydi Sánchez
Sub-Directora de DNA/CNV
Autoridad Aeronáutica Civil (AAC)
+507 3159805
leydi.sanchez@aeronautica.gob.pa

Iván De León Almengor
Jefe de Gestión
Dirección de Navegación Aérea
Autoridad Aeronáutica Civil (AAC)
+507 315 9813
ivan.deleon@aeronautica.gob.pa

Paraguay

Margarita Cabrera
DINAC PARAGUAY
+595981925435
gta-sdsa@dinac.gov.py margacaiba@gmail.com

Peru Paulo Vila Millones Coordinador técnico navegación aérea DGAC PERU + 51 965 990 567 pvila@mtc.gob.pe	 Dante Samaniego Bilbao Coordinador General Centro de Control de Área de Lima- CORPAC +51 961 108 222 dsamaniego@corpac.gob.pe
Suriname Mrs. Radha Atwaroe Head of ATS CADSUR +597 855 5025 radha_atwaroe@hotmail.com	 Quincy S. Cyrus ATS +597 7248980 +597 325176 qcyrus83@gmail.com
Uruguay Gustavo Turcatti Director de Tránsito Aéreo - ANSP - ATM +598 2604 0408 ext. 5105 & 5155 dta@dinacia.gub.uy	
Venezuela Carlos Armas Gerente ATM +584 243474208 carlos.armas@inac.gob.ve Carlos Castañeda Coordinación - planificación espacios aéreos +584 144546186 c.castaneda@inac.gob.ve cstd_crls@yahoo.com	 Wilfredo Gil Coordinador ATS +584 143475804 w.gil@inac.gob.ve

<<<

Sala de Situación, Oficina Regional Sudamericana OACI Lima – Perú
Situation Room, ICAO SAM Regional Office Lima – Peru

Phones; +511 611 8686 Ext. 136 - Ext. 301

Web: www.icao.int/sam | E-mail: icaosam@icao.int

Fabio Rabbani Regional Director frabbani@icao.int	Oscar Quesada Deputy Regional Director oquesada@icao.int

COORDINATORS

ATM

Fernando Hermoza
+51 980 321618
fhermoza@icao.int

Roberto Sosa
+51 924 239404
rsosa@icao.int

ALTERNATES

AIM/MET
Jorge Armoa
jarmoa@icao.int

CNS
Francisco Almeida
falmeida@icao.int

REDDIG network
Javier Vittor
+559 2984452593
jvittor@icao.int

<<<

ORGANIZATIONS	
IATA José Antonio Ruiz +1 305 326 3770 ruizjo@iata.org William Murphy +1 540 622 7381 murphyw@iata.org Marco Vidal +1 786 536 3476 vidalm@iata.org	**CANSO** Javier Vanegas +17862102568 javier.vanegas@CANSO.org

Julio Pereira +55 11 993800953 pereiraj@iata.org	

<<<<

INTER-REGIONAL COORDINATION ICAO CARIBBEAN REGION - CAR NACC Regional Office - Mexico + 52 55 5250 3211 | Web: www.icao.int/nacc | E-mail: icaonacc@icao.int	
Melvin Cintron Regional Director mcintron@icao.int	Julio Siu Deputy Regional Director jsiu@icao.int
COORDINATORS **ATM** Eddian Mendez +52 55 3643-9265 emendez@icao.int **AIM** Raul Martinez rmartinez@icao.int **CNS – MEVA network** Mayda Avila mavila@icao.int Dulce Roses dulce.roses@faa.gov **MET** Luis Sanchez lsanchez@icao.int	
COCESNA CENAMER Víctor Andrade Gerente de Operaciones	Fernando Soto Coordinador ATFM +504 9935-0027 fernando.soto@cocesna.org

+504 9762-0069 victor.andrade@cocesna.org	Supervisor Operativo Centro de Control CENAMER +504 2234-2507 +504 2283-4750 supervisoresats@cocesna.org
Curacao Jacques Lasten Deputy Director Dutch Caribbean ANSP +599 9 6703388 J.Lasten@dc-ansp.org	
Jamaica Courtney Malcolm Unit Manager - Kingston Air Traffic Control Centre +1 876 8161718 +1 876 9604640 courtney.malcolm@jcaa.gov.jm	
San Juan – Puerto Rico John Melecio FAA Office: 787-253-8790 john.melecio@faa.gov	
Trinidad and Tobago Ian R Gomez E/CAR ATM Rapporteur (868) 669-4806 Ext-2530; (868) 788-8284; igomez@caa.gov.tt ianr.gomez@gmail.com	

APPENDIX G: VOLCANIC ASH CONTINGENCY PLAN FOR THE
ICAO SOUTH AMERICAN REGION (VACP/SAM)

INTERNATIONAL CIVIL AVIATION ORGANIZATION

SOUTH AMERICAN REGIONAL OFFICE

VOLCANIC ASH CONTINGENCY PLAN FOR THE ICAO SOUTH AMERICAN REGION (VACP/SAM)

The full text of this Plan is part of the report of the 2015 ATM/MET/AIM/VA meeting and is posted on the website of the ICAO South American Regional Office at:

http://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2015-ATMMETAIMVA

APPENDIX H: EXTREME WEATHER CONTINGENCIES

[IN PREPARATION]

APPENDIX C

REGIONAL GUIDE ON THE IMPLEMENTATION OF PBN VISUAL RUNWAY PROCEDURES

APPENDIX C

INTERNATIONAL CIVIL AVIATION ORGANIZATION

SOUTH AMERICAN REGIONAL OFFICE

REGIONAL GUIDE ON THE IMPLEMENTATION OF PBN VISUAL RUNWAY PROCEDURES

This document has been prepared by the GESEA/SG2 PBN Visual Runway Working Group.

Version: Original

4 November 2020

REGIONAL GUIDE ON THE IMPLEMENTATION OF PBN VISUAL RUNWAY PROCEDURES

RECORD OF AMENDMENTS

Version	**Date**	**Amendment**	**Pages**
Original	4 November 2020	Approved SAMIG25	

TABLE OF CONTENTS

1 PURPOSE

1.1 The purpose of this Regional Guide is to provide a set of harmonised guidelines to guide States in the process of implementing PBN visual runway procedures, aimed at aircraft operators, PANS-OPS service providers, and ATS service providers.

2 JUSTIFICATION

2.1 The different quality assurance reports of air operations of different aircraft operators reveal the presence of some of the following inappropriate operating conditions or undesirable states when operating at airports with circling approach procedures (Doc 8168 Volume II), visual traffic pattern (downwind leg, base leg and final leg according to Doc 4444), or when operating at aerodromes without approach procedures, namely:

a) Descents during approach with excessive vertical speeds,
b) Inappropriate approach gradients,
c) Inadequate speeds and/or power settings,
d) Activation of unwanted terrain alerts,
e) Fuel consumption,
f) Reduced accessibility and number of operations

2.2 The use of PBN in the design of instrument approaches (IAPs) provides greater flexibility to airspace planners/designers for the efficient use of airspace and facilitates access to airports through the improvement of operational minima, which impacts on air connectivity that benefits socio-economic development.

2.3 The provision of PBN procedures supports stabilised approaches, prescribes initial-intermediate-final approach legs with due protection from obstacles, contributes to safety as it has an impact on the reduction of controlled flight into terrain/loss of control in flight (CFIT/ LOC-I) incidents.

2.4 ICAO Assembly Resolution A37-11: *Performance-based navigation global goals* promotes the implementation of approach procedures with vertical guidance (APV) (Baro VNAV and/or augmented GNSS), including LNAV-only minima, for all instrument runway ends.

2.5 Various industry players, including IATA and aircraft manufacturers, have expressed the need to extend PBN implementation to visual runway thresholds, precisely taking into account the aforementioned safety aspects.

3 SCOPE

3.1 The purpose of this guide is to provide, *inter alia*, design guidelines, navigation specifications, meteorological requirements and in-flight validation procedures for the development and safe application of PBN visual runway procedures.

3.2 This guide deals only with PBN flight procedures based on a straight-in approach to a visual runway.

3.3 The procedures developed based on the guidelines of this guide apply only to aircraft operators that have been approved by the CAA, in their operational specifications, to perform approach operations in the navigation specification required by the procedure.

3.4 It is important to underline that NOT only the guidelines of this guide may be used for the development of PBN visual runway procedures to be published in the State AIP, but also aircraft operators may propose for study and approval by the CAA, procedures of this type for any public or private aerodrome.

4 ACRONYMS AND DEFINITIONS

For the purposes of this guide, the following ICAO acronyms will apply:

CAA	Civil aviation authority
AFIS	Aerodrome flight information service
APV	Approach procedure with vertical guidance
AWOS	Automated weather observing system
CFIT	Controlled flight into terrain
LOC-I	Loss of control in-flight
OCA/H	Obstacle clearance altitude/height
OCS	Obstacle clearance surface
PBN	Performance-based navigation
RASS	Remote altimeter setting source
RNAV	Area navigation
SARPS	Standards and recommended practices
TIBA	Traffic information broadcast by aircraft
VSS	Visual segment surface

The following ICAO definitions apply in this document:

- Vertical path angle (VPA): Angle of the published final approach descent in baro-VNAV procedures.
- Area navigation (RNAV): A method of navigation which permits aircraft operation on any desired flight path within the coverage of the station-referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.
- Visual runway: A runway intended for the operation of aircraft using visual approach procedures or an instrument approach procedure to a point beyond which the approach may continue in visual meteorological conditions.

5 INTRODUCTION

5.1 In the SAM Region, a significant number of the existing visual runways received such classification decades ago, when the PBN concept did not exist, and based on a combination of reasons, including:

a) Some difficulty for conventional PANS OPS design, given the topography of the site;

b) The demand for operations was not significant and there was no perceived problem with airport accessibility, and it was also considered unfeasible to invest in radio aids and lights to implement IAPs; and/or

c) All airport users at the time operated only in VFR and in daytime hours. The runway is limited to visual operations, due to certain obstacles in the aerodrome environment.

5.2 With the passing of time, several airports have experienced an increase in operations and have had capacity and efficiency requirements that currently warrant the use of the visual runway, leading to the identification of the implementation of PBN procedures as a safe, timely and economic solution to meet the aforementioned objectives.

6 ATS CONSIDERATIONS

Aerodromes with ATC service

6.1 Separation of aircraft at ATC-serviced aerodromes where PBN visual runway procedures are implemented is in keeping with the methods outlined in Doc 4444 and/or applicable State regulations. The corresponding IAC must contain relevant information about the ATC, including working hours.

Aerodromes with AFIS

6.2 The provision of flight information at AFIS-serviced aerodromes where PBN visual runway procedures are implemented is in keeping with the methods outlined in ICAO Circular 211 and/or applicable State regulations. The corresponding IAC shall contain relevant information about the AFIS, including working hours.

Aerodromes with ATS

6.3 As required by applicable State regulations, the following applies at aerodromes without any ATS where PBN visual runway procedures are implemented:

a) aeronautical air-ground communication facilities will be established to provide safety-critical information, including meteorological information, condition of the runway and essential traffic; or

b) provision shall be made for the implementation of traffic information broadcast by aircraft (TIBA) procedures in accordance with ICAO Annex 11, Attachment B.

Airspace classification

6.4 Airspace classification is stipulated on the basis of ICAO Annex 11, and will be declared in accordance with the aforementioned ATS options. Therefore, the classification of airspace associated to the aerodrome shall be specified in the AD section of the State AIP and/or the corresponding IAC.

7 APPLICATION

7.1 General

These procedures are for the **exclusive use** of aircraft and flight crews approved in accordance with CAA requirements. The operation will be carried out in accordance with the PBN navigation specification set forth in the procedure (see 7.4 of this guide).

7.2 Design considerations

7.2.1 The procedure will be designed taking into account the provisions of ICAO Doc 8168 Volume II and/or Doc 9905 for procedures under RNP APCH, RNP AR APCH or A-RNP specifications, as appropriate. If necessary, a holding pattern will be established.

7.2.2 Operational minima

The lowest height to which it is possible to descend in instrument flight conditions when approaching a visual runway will depend on the complexity of the operational environment and the need for visual references to complete the approach safely.

The applicable OCH on a straight-in approach will be equal to or greater than 500 ft and visibility equal to or greater than 3000 metres. Further considerations on operational minima, relating to altimeter information, are shown in paragraph 7.2.6.

Note 1. – For the purposes of this guide, the 500 ft/3000 m minima cannot be reduced under considerations of runway markings and/or lights, airborne equipment, etc.

Note 2. - For safety reasons, States may determine the need to publish aerodrome operating minima, indicating the required minimum cloud base height (ceiling) and minimum visibility, for the purpose of visualising and avoiding obstacles in the aerodrome environment.

7.2.3 Obstacle clearance

Obstacle clearance will be applied using the areas and margins set out in Doc 8168 and Doc 9905.

For the purposes of this guide, section 5.4.6 of Doc 8168 Part 1, Volume II, concerning the protection of the visual segment of the approach procedure applies.

In case of penetration of the visual segment surface (VSS) on a visual runway, the procedure set forth in clause 5.4.6.4, which provides for the study and implementation of the corresponding mitigation measures, applies.

If none of the aforementioned mitigations are considered operationally acceptable, a determination is made as to whether the obstacles still penetrating the VSS require or induce the pilot to destabilise the approach in order to avoid them. To this end, the possible infringement of the obstacle clearance surface (OCS) will be assessed and action will be taken based on the following results:

a) If the OCS is penetrated, paragraph 5.4.6.6.1 applies.

b) If the OCS is not penetrated, the PBN flight procedure will continue to be designed and published, and ICAO provisions (see amendment 9 to Doc 8168) on publication of information on infringing obstacles are applied. (See note 2 below.)

In this context, it is underscored that the implementation of PBN flight procedures contributes to the avoidance of CFIT and LOC-I events, as compared to approaches without navigation guidance conducted in the aerodrome traffic pattern.

Note 1. – These criteria could also be taken into account for instrument runways.

Note 2.- Appendix A to this guide contains a Brazilian drafted AIC (free translation into English) entitled "Visual Segment Surface (VSS) of Instrument Approach Procedures", which can be taken as an example of best practice.

7.2.4 Coding tables

The drafting of the procedure coding table is the responsibility of the originator of the procedure and will be done in accordance with Doc 8697 and Doc 8168 Volume II for PBN approach procedures.

7.2.5 Departures and arrivals

The State will analyse the need to implement standard departure (SID) and standard arrival (STAR) procedures, and will establish the required take-off minima.

7.2.6 Altimetry information requirements

The instrument approach chart and the aerodrome information section in the AIP should contain all information concerning the applicable altimeter setting, as well as the source of such information (see also paragraph 7.6).

In this regard, the following applies:

a) The execution of a baro-VNAV instrument approach procedure requires having QNH information based on a local altimeter setting source (see Doc 8168, Volume II, Part 3, Section 4.1.4).

b) For the execution of LNAV-only instrument approach procedures, QNH information from a remote altimeter setting source (RASS) may be used. In this case, the percentage increase in OCH criteria (section 5.4.5 of Doc 8168, Volume II, Part 1) apply, which are limited to RASS sources located within 75 NM.

c) When the RASS source is located more than 75 NM from the aerodrome, LNAV-only instrument approach procedures, based on an OCH minimum equal to or greater than 1000 ft and visibility equal to or greater than 5000 metres, will be implemented.

Note: The local altimeter source and other relevant meteorological information can be obtained from an airport automated weather observing system (AWOS).

7.3 Flight operations

Flight rules and flight plan

7.3.1 The procedures implemented according to this guide are executed under instrument flight rules (IFR).

Normally, no distinction is required when filling out the flight plan form in boxes 8, 10, etc.

Phraseology

7.3.2 The implementation of PBN visual runway procedures normally does not require changes to ATS phraseology referred to in Doc 4444, Chapter 12; however, the State may establish special requirements regarding the applicable ATS phraseology during the execution of procedures designed under this guide.

Visual approach slope indicator systems

7.3.3 It is highly recommended that the implementation of PBN visual runway procedures contemplates the availability of visual approach slope indicators, given the importance of providing the pilot with adequate visual reference for the vertical flight.

The SARPS contained in ICAO Annex 14 and the corresponding State regulations establish the conditions for the use of these visual systems. Therefore, the State must contemplate periodic maintenance and calibration activities for these systems.

7.4 PBN visual runway operations approval process

The originator of the flight procedure design will make sure that the navigation specification requirement is established and clearly indicated on the approach chart, in accordance with the options referred to in paragraph 7.2.1 of this guide.

The user/operator interested in performing PBN visual runway approaches must obtain "aircraft and operator approval" to perform operations with the required navigation specifications, and must meet the requirements and process established by the regulatory authority of each State.

7.5 Validation of procedures

The instrument flight procedure validation process will be as defined by each State, in accordance with the requirements established in ICAO Doc 9906, Volume V - *Validation of instrument flight procedures*.

7.6 Publication and cartography

The procedures designed according to this guide will be published in an instrument approach chart (IAC), following the guidelines set out in Annex 4 - *Aeronautical charts*, Doc 8697 - *Aeronautical chart manual*, as well as the relevant regulations of each State.

The applicable OCH and visibility minima will be published in the aforementioned IAC, including any safety-related information.

8 FAMILIARISATION

8.1 Air operators and flight crews

Information on this type of procedures will be provided and published for air operators (including general aviation, military, etc.) and crews.

8.2 ATS personnel

ATS personnel (air traffic controllers or AFIS operators) will be briefed on these PBN procedures. This will include the characteristics of the procedure, as well as the meteorological minima for their application and the corresponding ATS operational procedures.

****

Appendix A - Reference: Brazil's AIC on VSS

(Original AIC in Portuguese. This is a free translation into English)

BRAZIL
MINISTRY OF DEFENCE
AERONAUTICS COMMAND
AIRSPACE CONTROL DEPARTMENT

AIC N
X/20
05 NOV 20

VISUAL SEGMENT SURFACE (VSS) OF INSTRUMENT APPROACH PROCEDURES

Period of validity: From 5 November 2020 to PERM

1 PRELIMINARY PROVISIONS

1.1 PURPOSE

The purpose of this aeronautical information circular (AIC) is to disseminate the concept and application of the visual segment surface (VSS) of instrument approach procedures.

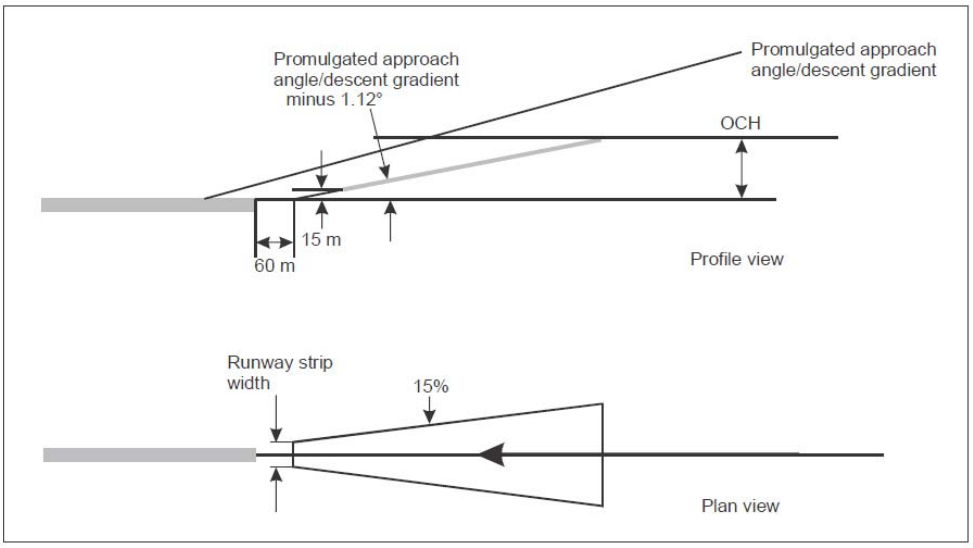
1.2 SCOPE

The provisions contained in this AIC apply to all those who, in the course of their activities, use the air navigation procedures published by DECEA.

2. VISUAL SEGMENT SURFACE (VSS)

2.1. The visual segment surface (VSS) is a surface constructed in accordance with the specifications of ICAO Doc 8168/PANS-OPS, Volume II, the purpose of which is to identify obstacles that may affect the execution of an instrument approach procedure (except a circling approach).

2.2. Basically, the VSS refers to the final approach leg of an approach procedure between the MDA/DA of the procedure and the runway threshold. See figure below:



2.3. When the VSS is penetrated by obstacles, an aeronautical study will be conducted to determine what mitigation measures must be taken to ensure continued safety. The mitigation measures normally adopted are:

a) Publicise the obstacle in the relevant aeronautical publications (AIP AD2.23, ROTAER, GEOAISWEB, etc.) for proper flight planning and situational awareness of pilots;
b) Mark and/or illuminate the obstacle;
c) Increase the operational minima of the procedure;
d) Offset the runway threshold;
e) Increase the vertical path angle (VPA) of the approach procedure;
f) Suspend the approach procedure until the obstacle is removed or lowered.

Note: One or more of these situations can be combined to increase the efficiency of mitigation actions and avoid excessive restrictions in the operation. In most cases, the adoption of the first two options listed above is sufficient to mitigate risk. The following is an example of a publication associated with the infringement of the VSS of an approach procedure.

VSS INFRINGED – EXAMPLE OF PUBLICATION

VISUAL SEGMENT SURFACE INFRINGED: PROC RNAV (GNSS) RWY 22: BUILDING 0.4 NM BEFORE RWY 22 ELEV 3118', TO THE RIGHT OF APPROACH CENTRELINE.

3. MEASURES TAKEN BY THE PILOT IN CASE OF INFRINGEMENT OF VSS

3.1. If the procedure is still in force, it means that the necessary measures have already been taken to ensure the safety of operations and no pilot action is required for manoeuvring to avoid obstacles infringing the VSS.

4. FINAL PROVISIONS

4.1 Cases not provided for in this CBA will be resolved by the Head of the Operations subsection of the Airspace Control Department.

****

Agenda Item 3: Report of activities and deliverables of the Interop TF and Subgroups

a) Review of air navigation priorities in the CNS field
b) Implementation
c) Draft conclusions
d) Formulation of the 2021 work plan

3.1 Under this agenda item, the following papers were reviewed:

a) WP/3.1 – *Activities executed by the ATM/AIDC, ATM/FPL, CNS/AMHS, and MET/IWXXM Subgroups* (presented by the Secretariat)
b) WP/3.2 – *Report of the CNS/SUR Subgroup* (presented by the Secretariat)
c) IP/3.1 – *Report of the progress made by the INTEROP TF and Subgroups in Argentina* (presented by Argentina)
d) IP/3.2 – *Implementation of AIDC in Colombia* (presented by Colombia)

3.2 The Meeting took note of the main activities carried out by the activated subgroups of the Interoperability Task Force (Interop TF):

ATM/AIDC Subgroup

3.3 Participants were informed that five teleconferences had been held to discuss the implementation of AIDC between adjacent automated centres. Despite the difficulties caused by the pandemic, a great effort had been made by Colombia, Ecuador, Panama, and Peru in 2020 to establish three AIDC links:

Guayaquil ACC – CENAMER ACC (16 March 2020);
Bogota ACC – Lima ACC (12 October 2020); and
Barranquilla ACC – Panama ACC (15 October 2020).

3.4 Two other AIDC links were in the pre-operational phase and would become operational by the end of 2020:

- **Barranquilla ACC –Maiquetia ACC**; and
- **Bogota ACC – Panama ACC**.

3.5 **Appendix A** to this part of the report describes the status of implementation of AIDC in the Region.

3.6 The Secretariat informed that a possible cause of CRC errors in ABI messages, identified during AIDC tests between Barranquilla ACC and Kingston ACC, would be the conversions in AMHS/AFTN gateways. In this regard, the Secretariat highlighted the importance of migration of users (human or automated systems) from the AFTN environment to the AMHS context.

Other information

3.7 In the information paper SAM/IG/25-IP/3.1, Argentina noted that, so far, AIDC had not been implemented on the 17 links planned (6 national, 10 regional, 1 intra-regional). Work was currently

underway on the first phase of national implementation in the 5 ACCs. In the second phase, operational implementation tasks would begin in adjacent ACCs, including the operational establishment of AIDC between the Cordoba ACC and the Iquique ACC.

3.8 In information paper SAM/IG/25-IP/3.2, Colombia reported the establishment of a multidisciplinary group to address this issue and described the experience gained.

ATM/FPL Subgroup

3.9 The ATM/FPL Subgroup was activated to address issues related to the mitigation of errors and duplication/multiplicity in flight plans, as well as issues related to centralised management of flight plans and associated messages.

SID/STAR coding

3.10 Regarding problems causing rejection of flights plans due to conflicting coding of SID/STAR routes included in the FPL, the IATA delegate highlighted the analysis conducted during the Interop TF meeting (27–30 October 2020), and reiterated that States could submit airline-specific information to IATA, including the 6 alphanumeric code, for the purpose of harmonizing the appropriate use of this data in the FPL.

3.11 LATAM clarified working paper 3.1 regarding the 6-character limitation in FMS systems, stating that international specification ARINC 424 - Navigation System Database, established the standards for the air transport industry for the preparation of data files for navigation systems on board aircraft, limiting them to 6 alphanumeric characters to make them compatible with the navigation database. In sum, the limitation is not inherent to the FMS but to the ARINC 424 standard.

3.12 For the specific case of SID/STAR identifiers, LATAM expressed that, although Annex 11 allowed up to 7 alphanumeric characters [identifier (5 characters) – validity indicator (1 character) – route indicator (1 character)], the nomenclature of routes with transitions had not yet been contemplated, even though ARINC 424 had already incorporated this nomenclature into its standard. The delegate of Brazil informed that the ICAO IFPP was already working on changes in the ICAO documentation to enable the insertion of transitions.

3.13 The Secretariat invited the Subgroup and States to work on this issue with the industry, since it handles specific technical details on these matters. It was agreed that IATA would communicate with the Secretariat and the rapporteur to expedite these tasks.

Standard format for ACK/REJ messages

3.14 The ATM/FPL Subgroup, through teleconferencing, had discussed the centralised management of flight plans (and associated messages) as well as draft flight plan acknowledgement (ACK) or rejection (REJ) message formats, that provided feedback to flight plan originators.

3.15 This matter was addressed under agenda item 4, concerning the approval of the ATM/FPL roadmap.

Other information

3.16 Argentina informed that, in order to correct FPLs filed with the SID and STAR coded in 6 characters, each area control centre had staff devoted to the correction of flight plans. No centralised management of flight plans was envisaged in the short term, and flight plan management agreements with airlines were to be maintained. Existing regulations did not mandate the use of ACK/REJ formats.

CNS/AMHS Subgroup

AMHS implementation

3.17 With regard to activities related to AMHS implementation in the SAM Region, the Meeting was informed that 26 out of the 28 intra-regional AMHS P1 interconnections had already been established.

3.18 Likewise, of the 13 interregional AMHS P1 interconnections, 6 had already been established. **Appendix B** to this part of the report presents the status of AMHS implementation in SAM States.

3.19 The expectation was that by next year all planned interconnections of AMHS COM centres in the Region would be completed. It was stressed that States wishing to establish other (extra-plan) connections should contact the relevant COM centres to reach agreement on the establishment of the connection.

Migration of AFTN users

3.20 The importance of planning the migration of the remaining AFTN users to the AMHS environment was underlined. The AFTN message (text) limited the possibility of automating the systems supporting air navigation services. New message formats were being implemented for the exchange of flight plans (FIXM), aeronautical information (AIXM) and weather information (IWXXM). AFTN users would not be able to handle messages in the new formats.

3.21 Special attention should be given to AFTN users hosted in automated systems, such as central flight plan processors, automatic meteorological stations and aeronautical information databases, whose adaptation for the exchange of messages in the AMHS environment involves relatively high costs.

SITA Type X gateway

3.22 The Meeting noted that the connection of the SITA Type X gateway to the two COM centres in the SAM Region (Brasilia and Ezeiza) had been completed in 2019. This interconnection enabled users of the aircraft operator messaging context (SITA) to exchange messages with AMHS users (ANSPs).

Other information

3.23 Argentina reported that there were currently five AMHS (P1) interconnections in place: Ezeiza with Brasilia, Asunción, Santiago, Lima, and La Paz. The Ezeiza - Montevideo and Ezeiza - South Africa links were still *via* AFTN channels. The P1 connection with SITA (Atlanta) was also implemented. There were also plans for a new AMHS (P1) interconnection with Venezuela, as well as the implementation of future intra-regional interconnections of Ezeiza with Spain and South Africa through new REDDIG II (MPLS) nodes. A new AMHS system to replace the existing one was scheduled to be purchased in 2021.

The AMHS COM centre contingency plan was expected to be presented at the first workshop/meeting of the subgroups of the Interoperability Task Force (Interop TF/2).

CNS/SUR Subgroup

3.24 The Meeting was informed of the activities carried out by the CNS/SUR Subgroup, as shown in working paper SAM/IG/25-WP/3.2.

3.25 Five teleconferences had been held to discuss the issue and obtain the necessary information to conduct an analysis with recommendations to move forward with the initiative to implement Space-based ADS-B, using REDDIG II for the distribution of surveillance information, addressed to States interested in contracting the service.

3.26 At the request of the representatives of States participating in the CNS/SUR Subgroup, the SAM Regional Office sent LT2/3.1.2 - SA291 on 21 September 2020, asking the aeronautical authorities of the States of the Region to indicate whether they were interested in joining a potential implementation of the Space-based ADS-B data service.

3.27 Two State administrations (Chile and Panama) replied with letters expressing interest in the initiative.

3.28 A summary of the analysis carried out by the subgroup was completed during the Interop TF Subgroup meeting (virtual, 27-30 October 2020). **Appendix C** to this part of the report contains the cited document, aimed at supporting a conclusion by the States.

Other information

3.29 The 2020-2024 AIR NAVIGATION SERVICE PLAN submitted by the air navigation service provider EANA S.E. to the aeronautical authority ANAC contemplated the implementation of ground-based ADS-B systems to supplement radar coverage, the upgrade of Mode A/C to Mode S, and did not envisage the use of the Space-based ADS-B system in Argentina in the short term.

MET/IWXXM Subgroup

3.30 The Meeting was informed of the activities carried out by the MET/IWXXM Subgroup on the adaptation of the systems of aeronautical meteorology users to the new weather message format (IWXXM).

3.31 Two main initiatives were addressed by the MET/IWXXM Subgroup: a converter from the TAC format to the IWXXM format, called METAX, developed by Venezuelan staff, and the adaptation of the Brasilia regional OPMET data bank by the Brazilian administration.

METAX system

3.32 The METAX system was developed by Venezuelan staff for the conversion of meteorological information from the TAC format to the IWXXM format. METAX is an application that can be installed on a network or as a web service. Users accessing METAX can enter the respective message (METAR, TAF, SIGMET, etc.) in the TAC format and the system will generate an XML file with the

meteorological information coded in the IWXXM format. The METAX system can also process weather bulletins.

3.33 A presentation on the METAX system is available at:

https://www.icao.int/SAM/Documents/RLA06901-GTINTEROP1/iwxxm_metax_ve.pdf

The existing regional OPMET data bank of Brasilia

3.34 The representative of Brazil informed that the regional OPMET data bank of Brasilia had been adapted to the new format in 2017, so as to receive and transmit weather information in **version 2.1** of the new IWXXM format.

3.35 Weather information (attached) correctly coded in version 2.1 of the IWXXM format contained in an AMHS message sent by a MET user will be accepted by the regional OPMET data bank of Brasilia and stored in the database. The system will also convert the same weather information to the traditional alphanumeric format (TAC) and also store it in the database. The existing system is reversely compatible with the traditional alphanumeric (TAC) format.

3.36 In case the weather information has a coding error (or data inconsistency), the message will not be entered in the database and an AMHS message will be sent to the originator indicating the rejection.

New system (foreseen for March 2021)

3.37 Likewise, the representative of Brazil informed that a new regional OPMET data bank was being implemented in Brasilia, adapted to version 3.0 of the new IWXXM format (and previous versions), with the same reception and transmission characteristics of the aeronautical messaging service (AMHS or AFTN) described above for the existing system.

3.38 In addition to the functionalities present in the existing system, the new system would make it possible for registered MET users to access a web service that would allow the insertion and consultation of weather information through IP networks (Intranet or Internet).

3.39 The future system would also allow other database systems to exchange information directly (database to database). To this end, systems must meet the interoperability requirements of the Interface Control Document (ICD) for data exchange.

3.40 The system would store the meteorological information in the database (of the regional OPMET data bank of Brasilia) in both formats (TAC and IWXXM). Users would also be able to use the web service to query information stored in both formats.

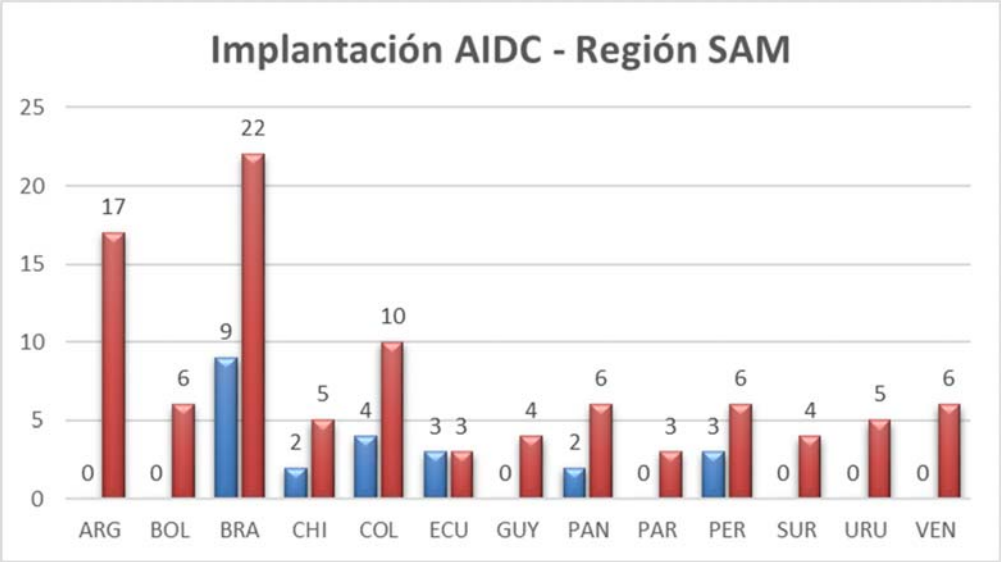
Other information

3.41 In information paper SAM/IG/25-IP/3.1, Argentina informed the Meeting that the national meteorological service (SMN) had a format converter built into the switch. Tests had been carried out with the existing AMHS infrastructure, and as a result of the latest tests, it was noted that messages with attached files in IWXXM format transmitted from the SMN entered correctly into the MTA of the EANA communications centre in Ezeiza (CECODI). Further message transmission and reception tests (end-to-end link) between CECODI and the regional OPMET data bank of Brazil were still pending.

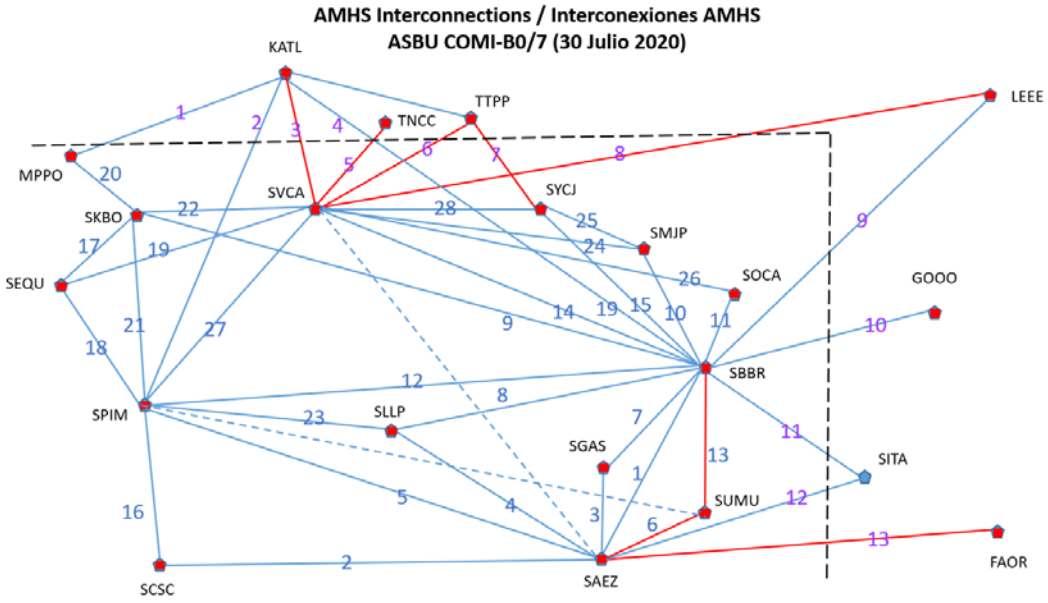
3.42 During a transition period, information would circulate in both formats (alphanumeric and IWXXM). EANA would continue to collaborate in testing. There were also plans to acquire a new AMHS system, with all its components (MTA and user agent), that meets the requirements of the above-mentioned amendment and that can handle messages in the XML format, as required by the regulation.

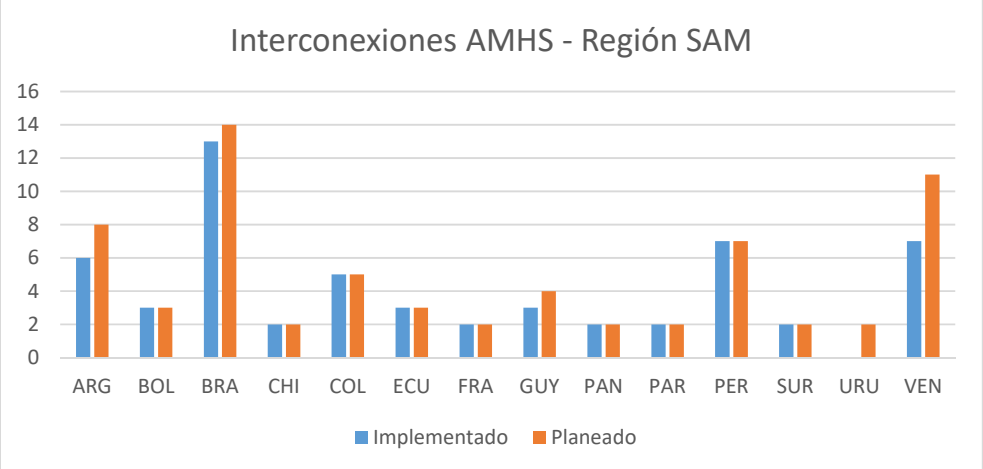
– – – – –

APPENDIX A


Implantación AIDC - Región SAM
25
20
15
10
5
0
ARG
BOL
BRA
CHI
COL
ECU
GUY
PAN
PAR
PER
SUR
URU
VEN
0
17
0
6
9
22
2
5
4
10
3
3
0
4
2
6
0
3
3
6
0
4
0
5
0
6

APPENDIX B


AMHS Interconnections / Interconexiones AMHS
ASBU COMI-B0/7 (30 Julio 2020)
KATL
TTPP
TNCC
LEEE
MPPO
SVCA
SYCJ
SKBO
SMJP
SEQU
SOCA
GOOO
SBBR
SPIM
SLLP
SGAS
SITA
SUMU
SCSC
SAEZ
FAOR


Interconexiones AMHS - Región SAM
16
14
12
10
8
6
4
2
0
ARG
BOL
BRA
CHI
COL
ECU
FRA
GUY
PAN
PAR
PER
SUR
URU
VEN
Implementado
Planeado

APPENDIX C

REGIONAL IMPLEMENTATION OF SPACE-BASED ADS-B

1. OBJECTIVE

1.1 This document aims to present a summary of the analysis carried out by the CNS/SUR Subgroup regarding a regional implementation of Space-based ADS-B (Space-based ADS-B), using the Digital Network of the SAM Region (REDDIG II) as a distribution platform for surveillance data and its respective recommendations.

1.2 Regional implementation is considered, the initiative of a group of States to implement the service, through a Regional Technical Cooperation Project, using the IP regional network as a means of transmitting surveillance information.

2. BACKGROUND

2.1 The issue of Space-based ADS-B implementation was discussed for the first time during the SAM/IG/18 Meeting (Lima, 17 to 21 October 2016), having being prepared the following item in the Meeting Report:

> *4.20 The Meeting was informed by AIREON of the operation of space ADS-B and the use of the EUROCONTROL PENS network for the distribution of processed information from Space-based ADS-B to air navigation service providers interested in that service and that this distribution in the SAM Region could be done through REDDIG II.*

2.2 As of this event, the matter was discussed within the framework of the SAM Region Implementation Group (SAM/IG) and the Coordination Committee of the Regional Project RLA/03/901 (REDDIG).

2.3 At the Eleventh Coordination Meeting of Project RLA/06/901, which supports the activities of the SAM Region Implementation Group (SAM/IG), a study was approved on the convenience and feasibility of the Space-based ADS-B proposed by AIREON at the regional level, given the benefits identified of this system by the States of the SAM Region:

- Coverage in existing gaps in the surveillance systems of the Region States.;
- Coverage in border areas as an alternative to the exchange of surveillance data between adjacent States;

- Coverage in oceanic areas beyond the reach of terrestrial surveillance systems;
- Surveillance solution for Non-FIR Space; and
- Constant update of the position of the targets, in contrast with the periodic update provided by the ADS-C.

2.4 The final study on the Convenience and Feasibility of the Space-based ADS-B Service was presented at the SAM/IG/22 Meeting (Lima, 19 to 23 November 2018). In Agenda Item 5, the following item of the Report was prepared:

5.56 The study concludes that the use of the Space-based ADS-B system in the Region is feasible due to its coverage, response time in the information transfer process or latency, and availability of information, for en-route airspaces above 10,000 feet, which was the airspace analysed in this study.

2.5 As of the SAM/IG/24 Meeting (Lima, 04 to 08 November 2019), the matter was dealt with by the CNS/SUR Subgroup activated in this meeting, which has held seven teleconferences, with a view to presenting the result of the analysis and recommendations at the SAM/IG/25 (Virtual) Meeting, to be held in the period from 02 to 04 November 2020.

3. SPACE-BASED ADS-B

3.1 The Space-based ADS-B system was implemented by a group of air navigation service providers (IAA, ENAV, Nav Canada, NAVIAIR and UK NATS) that partnered with Iridium Communications to establish a service for the provision of aeronautical surveillance information with global coverage. Figure 1 illustrates the implementation of Space-based ADS-B with 66 Iridium Next low orbit satellites,

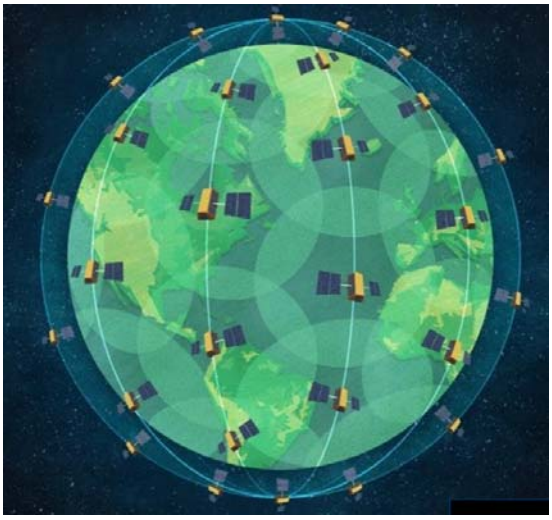


Figure 1 – Constellation Iridium Next

3.2 This service provides surveillance information of properly equipped aircraft, with ADS-B transponders of any version, to air navigation service providers (ANSP) that provide air traffic control in a specific area.

3.3 The same signal emitted by the aircraft (1090 MHz ES), which can be captured by ground-based sensors, is also captured by sensors installed in a constellation of low-orbit satellites (Iridium), which transmit all the emissions to a center that processes them and it can distribute the surveillance data to the air traffic control centers of the ANSPs that contract the service. Figure 2 illustrates the concept of operation of the Space-based ADS-B service.

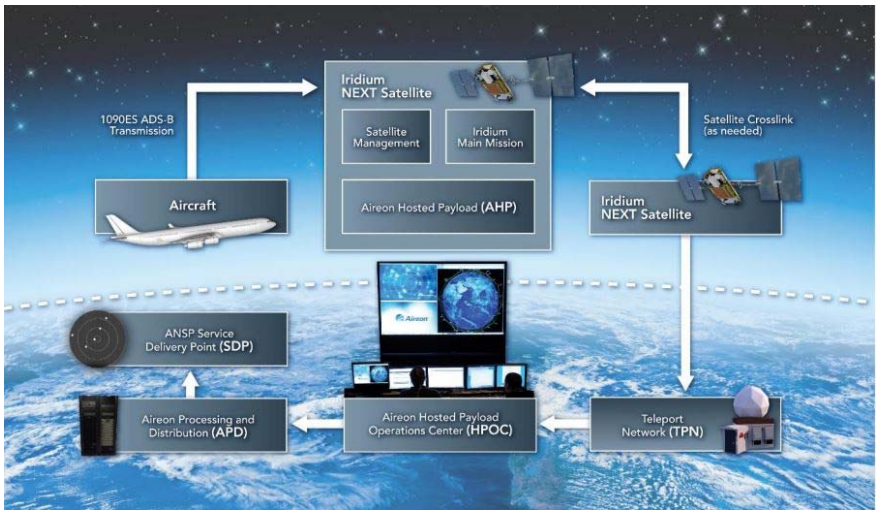


Figure 2 – Space-based ADS-B operation concept

4. IDENTIFIED BENEFITS

4.1 **Safety** - Effective surveillance in areas where there is currently no coverage, definitely contributes to increasing safety.

4.2 **Flight efficiency** - The effective surveillance capacity of ADS-B information provides means to optimize flights and increase the capacity to use airspaces.

4.3 **Flexibility** - Allows the ANSP to contract specific areas or volumes, at flight levels of operational interest, as the sole means of surveillance or as an augmentation of an existing surveillance infrastructure, as well as redundancy in areas of critical operational interest.

4.4 **Homogeneity** - In a regional implementation, with the States obtaining information from the same source, with the same levels of parameters, it enables the homogenization of air navigation services throughout the Region, as well as the sharing of surveillance data in an efficient and safe way.

4.5 **Environment** - Better flight management, increasing capacity, providing more direct flights and reducing waiting times, contribute to reducing the adverse impacts of aviation on the environment.

4.6 **Profitability** - With more efficient and economical flights profitability for aircraft operators becomes sustainable, with positive impacts for the final user. From the point of view of the ANSPs, the decrease in the infrastructure implemented and the maintenance required have a significant impact on this aspect.

4.7 **Situational awareness and ATFM** - Improved situational awareness by the controller through 100% vigilance in all sectors, FIR and beyond FIR limits. In agreement with the adjacent FIRs, surveillance information up to 50 NM beyond the border of the contracted area, is provided free of charge.

4.8 **Search and Rescue Services** - It is possible to meet the requirements for an effective SAR service, by having precision in the search for a lost aircraft.

4.9 **Optimization of the surveillance infrastructure** - Being a flexible and cost-effective system, the ANSP can perform a better optimization of the surveillance infrastructure, combining systems to guarantee aviation security and have better operational and economic efficiencies in the provision of air navigation services.

4.10 **Effectiveness in the surveillance infrastructure cost** - AIREON's way of charging to provide the Space-based ADS-B service is based on the hours actually flown within the contracted airspace, so that, with a lower or higher volume of operations, the charge is lower or higher, but at the same time the revenue from air navigation charges for the ANSP is lower or higher.

5. NECESSARY INFRASTRUCTURE

5.1 Classically, for the provision of the service, it is necessary to install a service delivery point (SDP) with redundant equipment (1+1) and redundant communication links, through two MPLS telecommunications service providers. Figure 3 presents the basic configuration of the service provision.

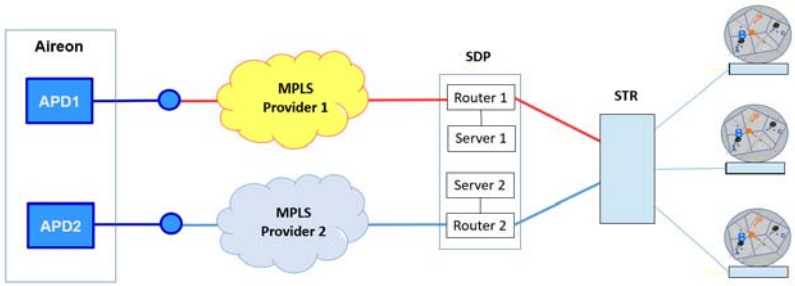


Figure 3 - Basic configuration

5.2 Once the States of the SAM Region have a regional IP network capable of distributing surveillance information, said infrastructure can be used, lowering the costs of contracting a telecommunications provider.

5.3 In this sense, it is sufficient for the Space-based ADS-B service provider, to implement an “additional node” REDDIG II, contracting directly the same telecommunications provider (CenturyLink) of the regional network. Since AIREON is already a CenturyLink customer, it is only necessary to make the configuration to enable communication between the AIREON node and the other nodes on the network interested in receiving surveillance information. Figure 4 illustrates this possibility.

5.4 The topology illustrated in Figure 4 shows the following technical advantages:

- Low latency in the two communication links;
- High availability of the service; and
- Scalability.

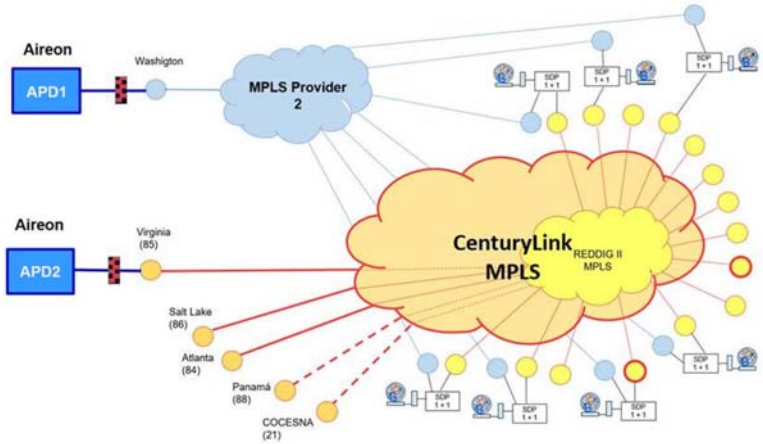


Figure 4 - Regional IP network (REDDIG II) as distribution link of Space-based ADS-B

6. ASSOCIATED COSTS

6.1 NON-RECURRING COSTS

6.1.1 From the information obtained from the company, the participants of the CNS/SUR Subgroup have identified the following estimated non-recurring costs:

- Installation of the direct communication link between AIREON and the States - USD 2,000.00;
- Installation of the service delivery point (SDP) - USD 175,000.00;
- In-Service Acceptance Tests (ISAT) - USD 100,000.00

6.1.2 For the implementation of the second communication link, a value of USD 2,000.00 is estimated for the installation of the point of presence (PoP) of the telecommunications provider (MPLS). However, this cost varies from one State to another depending on the structure of the national backbone networks of the Telecommunications Providers and the installation costs of the last mile circuits.

6.1.3 The cost of USD 175,000.00 for the implementation of the SDP includes the design of the installation site, the acquisition of the necessary equipment (1 rack, 2 routers, 3 servers, 1 maintenance terminal and accessories), software licenses, the installation of all equipment, the configuration of the equipment, the training of technical personnel and travel expenses.

6.1.4 The ISAT (In-service Site Acceptance Test) has a cost of USD 100,000.00 per site and includes the verification of the communication links, execution of tests, delivery of the test plan and procedures, preparation activities for the tests, conducting the tests, analyzing the tests, preparing the test report and travel expenses.

6.2 RECURRING COSTS

6.2.1 The recurring costs are the contracting of the redundant 2 Mbps MPLS link between AIREON and the States, estimating an average monthly value of USD 1,250.00 (or USD 15,000.00 per year). The use of the topology using REDDIG allows the States to save on the installation of the direct MPLS main line between AIREON and the States.

6.2.2 According to the information from the convenience and feasibility study (see paragraphs 2.3 and 2.4), the costs for Space-based ADS-B data services are better in most cases than the costs for radar or ADS-B terrestrial infrastructure and even more competitive. However, each State will carry out its own cost-benefit analysis concerning using this technology based on its existing processes and air navigation projects to determine the viability and desire to implement these services in its airspace.

7. CONCLUSIONS

7.1 The CNS / SUR subgroup, based on the analysis of the information, concludes the following:

- The Space-based ADS-B service has benefits for the States of the SAM Region regarding air safety, increased situational awareness, improvement in flight planning and management, SAR, and optimization of installation and operation costs. In a regional implementation, the benefits would be exponential since there would be airspace without borders, in which States can improve ATFM by having the same surveillance data, eliminating bottlenecks, and providing direct routes to the operators of the air space.

- The use of the REDDIG network represents an important benefit for the States in a Space-based ADS-B implementation, since significant savings can be made in telecommunications costs, without degrading the availability or performance of the service. Topology 3 presented by AIREON, in which it would install an additional network node in its facilities, is the option with the greatest operational and economic advantage for the States, both for a regional implementation and for a direct implementation of each State with AIREON .

- Not all States are in the same operational and economic situation to be able to join a regional implementation at the same time. However, for those countries that have already confirmed their interest in participating, as well as those that want to join this initiative, it is important as a region to advance in this solution, and that the States that wish to do so can join at the most convenient time for them.

- Considering that Trinidad and Tobago, although it is not a member State of the SAM Region, but a member of REDDIG and has indicated its interest in acquiring the Space-based ADS-B system, it is deemed appropriate to invite this State to participate in the regional implementation .

- Considering the existence of the regional REDDIG project and that the regional implementation of Space-based ADS-B contains the use of the regional IP network as a basis for telecommunications, it is convenient to carry out the regional implementation within the Regional Project RLA/03/901 (REDDIG).

8. RECOMENDATIONS

8.1 Considering the aforesaid information, the CNS/SUR subgroup recommends the following:

- Continue with the regional implementation of Space-based ADS-B, through a regional project, with those States interested in its implementation in their airspaces;

- The adoption of the Regional Project RLA/03/901 (REDDIG), for the regional implementation of Space-based ADS-B;

- Invitation to Trinidad and Tobago to participate in the regional implementation of Space-based ADS-B; and

- Promote agreements with the provider of this service, for operational and technical tests, in states of the SAM region to evaluate the behavior concerning integrating this technology with other existing ones.

Agenda Item 4: SAM/IG conclusions and next actions - Plenary

a) Summary of sessions
b) Review and approval of conclusions
c) Approval of the 2021 work plan

4.1 Under this agenda item, the plenary of the SAM/IG meeting reviewed the following papers:

a) WP/4.1 – *Analysis and summary of the GESEA group and formulation of conclusions for consideration by the plenary of SAM/IG/25* (presented by the Secretariat)
b) WP/4.2 – *Report of the CNS/S Subgroup on Agenda Item 4: 2021UR Work Plan* (presented by the Secretariat)
c) WP/4.3 – *Deliverables of the Interop TF and draft conclusions* (presented by the Secretariat)
d) WP/4.4 –*2021 Work Plan of the INTEROP TF* (presented by the Secretariat)

Conclusions on GESEA matters

4.2 The plenary of the Meeting took note of the discussions and other matters presented by GESEA, as well as of the characteristics and content of the deliverables produced by the SG1 and SG2 subgroups. Details of these are contained in the report on Agenda Item 2.

4.3 In this regard, five conclusions were approved as follows.

<table>
<tr><td colspan="2">CONCLUSION SAM/IG/25-01 Implementation of strategic direct routing - EDE</td></tr>
<tr><td>That:

SAM States analyse the guidance material prepared by the GESEA SG1 on the strategic direct routing (EDE) concept, which has been made available to the administrations, and coordinate with IATA and international airlines, as well as with adjacent States, for its implementation.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☒ Environmental
☒ Technical/Operational</td></tr>
<tr><td colspan="2">Why: To achieve harmonised and comprehensive implementation of EDE in the SAM Region in order to enhance the benefits of this initiative, which supports the early recovery of aircraft flows in the Region and reduces CO2 emissions into the atmosphere.</td></tr>
<tr><td>When: As soon as possible</td><td>Status: Adopted by SAM/IG/25</td></tr>
<tr><td colspan="2">Who: ☒ Coordinators ☒ States ☒ ICAO SAM Secretariat ☒ Other: Users/Industry</td></tr>
</table>

CONCLUSION SAM/IG/25-02	**Adoption of the guidelines of the SAM ATS contingency framework plan (MCATS/SAM) and alignment of national plans**
That: States adopt the guidelines of the SAM ATS Contingency Framework Plan developed by GESEA and start harmonising their national ATS contingency plans, so that the documentation required for regional activities on contingency plans and letters of ATS agreement, tentatively scheduled for 2021, may be available on a timely manner.	**Expected impact:** ☐ Political / Global ☒ Inter-regional ☒ Economic ☒ Environmental ☒ Technical/Operational
Why: To achieve harmonised implementation of national ATS contingency plans, duly agreed with neighbouring States, including CAR States, where appropriate, thus increasing the resilience of ATS and SAM airspace.	
When: No later than 15 April 2021	**Status:** Adopted by SAM/IG/25
Who: ☒ Coordinators ☒ States ☒ ICAO SAM Secretariat ☒ Other: Users/Industry	

CONCLUSION SAM/IG/25-03	**Activities for the development of the SAM ATM/CNS contingency framework plan**
That: States support GESEA activities towards a second stage of the MCATS, with a view to developing guidance material for a "SAM ATM/CNS Contingency Framework Plan".	**Expected impact:** ☐ Political / Global ☒ Inter-regional ☒ Economic ☒ Environmental ☒ Technical/Operational
Why: To achieve harmonised implementation of national ATM/CNS contingency plans, with interfaces to AIM, MET services, airports, etc., and duly agreed with neighbouring States, including CAR States, where appropriate, thus increasing the resilience of ANS and SAM airspace.	
When: No later than October 2023	**Status:** Adopted by SAM/IG/25
Who: ☒ Coordinators ☒ States ☒ ICAO SAM Secretariat ☐ Other: Users/Industry	

CONCLUSION SAM/IG/25-04	**Adoption of the Regional guide on the implementation of PBN visual runway procedures**
That: SAM States adopt the Regional guide on the implementation of PBN visual runway procedures developed by GESEA and, on this basis, approve national regulations on the implementation of these procedures.	**Expected impact:** ☐ Political / Global ☐ Inter-regional ☒ Economic ☒ Environmental ☒ Technical/Operational
Why: To implement IAPs and ensure safety during visual runway approaches, based on the provision of PBN and on-board navigation capabilities.	
When: As soon as possible	**Status:** Adopted by SAM/IG/25
Who: ☒ Coordinators ☒ States ☒ ICAO SAM Secretariat ☒ Other: Users/Industry	

CONCLUSION SAM/IG/25-05	**Studies on RNAV visual flight procedures - RVFP**
That: The GESEA SG2 conduct studies on the implementation of RNAV visual flight procedures (RVFP), in order to have available a harmonised regional guide aligned with ICAO provisions.	**Expected impact:** ☐ Political / Global ☐ Inter-regional ☒ Economic ☒ Environmental ☒ Technical/Operational
Why: To standardise RVFP design criteria in the SAM Region, in line with ICAO developments on this matter.	
When: Starting in 2021. Study results no later than October 2022.	**Status:** Adopted by SAM/IG/25
Who: ☐ Coordinators ☒ States ☐ ICAO SAM Secretariat ☐ OACI HQ ☒ Other: Users/Industry	

2021 GESEA Work Plan

4.4 Based on the aforementioned conclusions, and addressing the subjects under study by GESEA according to its terms of reference, and to facilitate SAM/IG air navigation implementations, the 2021 work plan was reviewed. It was felt that the plan **should provide only tentative dates**, since the evolution of the pandemic was still uncertain.

4.5 The Meeting agreed that all SAM/IG events that could be held face-to-face in 2021 should consider the concurrent implementation of a "virtual room" in order to receive a larger number of delegates and participants through the teleconference or webinar modality.

4.6 Following the discussions, the 2021 work plan was approved, and the Secretariat was requested to submit it for consideration and endorsement by the RCC14 of RLA/06/901, which would meet on 1 December 2020, according to the following table:

INTENTIONALLY LEFT BLANK

Activities	Objectives/Deliverables	Tentative dates
Activities for developing the CAR/SAM ANP Vol III	• Development of Vol III with the participation of all SAM and CAR States. Use of the AN SPA, and completion of forms and template.	**TBD** **Several virtual/face-to-face meetings**
GESEA plenary meeting	• Organisation of the implementation of concepts according to subgroup 2020 deliverables • Review and adjustment of the annual work plan • Follow-up of activities	**Virtual** **16 to 18** **March**
GESEA SG1 meeting Airspace planning	• Further studies according to the annual work plan • Follow-up to implementation activities	**Virtual** **6 to 8 April**
GESEA SG2 meeting PANS OPS	• Further studies according to the annual work plan • Follow-up to implementation activities	**Virtual** **27 to 29 April**
First workshop/meeting on optimisation of ATS coordination and SAM/ATS/ATFM contingency plans - SAM SOUTH	• Regional harmonisation based on MCATS • Updating of letters of operational agreement between States, including ATS contingency plans, and including ATFM. Signing of agreements. • Promote implementation of 20 NM separation minima in continental airspace.	**Lima, 17 to 21 May** **Concurrent face-to-face and, simultaneously, virtual**
Second workshop/meeting on optimisation of ATS coordination and SAM/ATS/ATFM contingency plans - SAM/NORTH	• Regional harmonisation based on MCATS • Updating of letters of operational agreement between States, including ATS contingency plans, and including ATFM. Signing of agreements. • Promote implementation of 20 NM separation minima in continental airspace.	**Lima, 14 to 18 June** **Concurrent face-to-face and, simultaneously, virtual**
SAM/IG/26 Air navigation implementation priorities contemplated in GREPECAS programmes, the regional ANP Vol III, and regional initiatives	• Continue implementation and optimisation activities under GESEA studies. • Sign the last ATS LoAs and harmonise contingency plans • Action plans derived from the SAM airspace efficiency-capacity CONOPS and elements of the ANP Vol III	**Lima, between September and December** **Concurrent face-to-face and, simultaneously, virtual**

Development of regional guidance material on airspace planning regulations	• Material on the formulation of airspace implementation/optimisation projects	• **2 weeks' mission by specialist, leaded to elaborate and coordinate documentation.** • **Virtual workshop**
Training for airspace planners	• Airspace organisation and design techniques - ASM.	• **2 weeks' mission by specialist, leaded to elaborate and coordinate documentation, also impart a workshop.** • **Concurrent face-to-face and, simultaneously, virtual**
Regional ATFM planning, harmonised with GANP/6 for 2022 – 2026	• Review of regional ATFM service planning • Interface with A-CDM. • Feasibility study of a centralised ATFM	• **one-week missions by 2 ATFM specialists** **Concurrent face-to-face and, simultaneously, virtual**

Deliverables of the Interop TF and draft conclusions

4.7 The Meeting was informed of the deliverables of each activated subgroup of the Interoperability Task Force (Interop TF).

ATM/AIDC Subgroup

4.8 The main objective of the ATM/AIDC Subgroup is the establishment of the 76 data link communication circuits between ATS units (AIDC) by SAM States. To date, 16 intra-regional and 2 inter-regional AIDC links had been established.

4.9 The first deliverable of the ATM/AIDC Subgroup was a training course that was held in Santiago on the first semester of 2019, with the support of EASA, which had delivered the ATM Automation Course for 14 participants (all from Chile).

4.10 The second deliverable of the ATM/AIDC Subgroup was the production of a report following visits made in August 2019 by an EASA specialist, accompanied by Indra representatives, to the

area control centres of Cordoba and Iquique. The report containing recommendations for the establishment of AIDC between the Cordoba ACC and the Iquique ACC was sent to the focal points of Argentina and Chile.

4.11 AIDC links established in 2019 and 2020 were also considered as deliverables of the ATM/AIDC Subgroup. In 2019, the following AIDC links became operational:

- **Bogota ACC – Barranquilla ACC;**
- **Bogota ACC – Guayaquil ACC; and**
- **Panama ACC – CENAMER**.

4.12 In 2020, five teleconferences were carried out to discuss the implementation of AIDC between adjacent automated centres. Despite the difficulties caused by the pandemic, a great effort was made by Colombia, Ecuador, Panama, and Peru to establish three AIDC links:

- **Guayaquil ACC – CENAMER ACC (16 March 2020);**
- **Bogota ACC – Lima ACC (12 October 2020); and**
- **Barranquilla ACC – Panama ACC (15 October 2020).**

4.13 The Meeting took note of two other AIDC links that were in the pre-operational phase and that should become operational by the end of 2020:

- Barranquilla ACC – Maiquetia ACC
- Bogota ACC – Panama ACC.

4.14 Likewise, as a future deliverable, a compilation would be made of the adjustments required in systems already in the operational phase in the Region, to allow for the establishment of other AIDC links, to serve as a reference for the connection of similar systems in the States.

ATM/FPL Subgroup

4.15 The Meeting took note of two deliverables produced by the ATM/FPL Subgroup: the development of an ATM/FPL roadmap for the SAM Region, as presented in **Appendix A** to this part of the report, and a proposal to adopt a format for acknowledgment (ACK) and rejection (REJ) of flight plans and associated messages.

4.16 In this regard, the following conclusion was approved:

Conclusion SAM/IG/25-06	**Approval of the ATM/FPL Roadmap and of the format for acknowledgment (ACK) and rejection (REJ) of flight plans and associated messages**
That States: a) Approve the ATM/FPL Roadmap and the format for acknowledgment (ACK) and rejection (REJ) of flight plans and associated messages; and b) Adopt the guidelines and procedures of the ATM/FPL Roadmap.	**Expected impact:** ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental

	☒ Technical/Operational
Why: To mitigate the occurrence of errors and duplication/multiplicity of flight plans, also providing feedback to the originators of FPLs and associated messages.	
When: As soon as possible	**Status:** Adopted by SAM/IG/25
Who: ☒ Coordinators ☒ States ☒ ICAO SAM Secretariat ☒ TCB ☒ Other: Industry/Users	

CNS/AMHS Subgroup

4.17 The CNS/AMHS Subgroup has the objective of resolving interoperability issues during the implementation of AMHS COM centre systems, as well as supporting the other groups on matters related to aeronautical messaging.

4.18 The main deliverables were: the conduction of the advanced AMHS course (virtual, 14-18 September 2020) and the first workshop/meeting of supervisors/operators of AMHS COM centres of the SAM Region (virtual, 23-25 September 2020), the development of AMHS COM centre contingency plans, and the establishment of AMHS P1 interconnections.

4.19 Regarding AMHS (P1) interconnections, despite the impact of the pandemic, important interconnections were established in 2020. To date, 26 regional interconnections had already been established, with only 2 AFTN circuits (SAEZ – SUMU and SBBR – SUMU) still in operation, which should be replaced with an AMHS (P1) interconnection.

4.20 In addition to regional interconnections, 2 inter-regional AMHS interconnections had been established in 2020: SPIM (Lima) – KATL (Atlanta) and SBBR (Brasilia) – GOOO (Dakar). Two more interconnections (SVCA (Caracas) – KATL (Atlanta) and SVCA (Caracas) – TTPP (Piarco)), already in the interoperability testing stage, should be completed by the end of 2020.

CNS/SUR Subgroup

4.21 The CNS/SUR Subgroup was activated to deal with interoperability issues in surveillance systems, and was also entrusted with conducting an analysis of a potential regional implementation of Space-based ADS-B using the regional IP network (REDDIG II) as the platform for the distribution of surveillance data.

4.22 During the work of the Subgroup, the participating States had requested the SAM Regional Office to ask SAM States about their interest in participating in a Space-based ADS-B implementation initiative, using the regional IP network as a means to distribute surveillance data, under a regional technical cooperation project.

4.23 In response to the aforementioned consultation, Chile and Panama expressed their interest in participating in a Space-based ADS-B implementation, with the support of ICAO through a regional technical cooperation project, enabling the conduction of all the analyses and formalities required for a potential contracting of the service.

4.24 A deliverable of the Subgroup was a summary of the analysis conducted, recommending that those States that had expressed interest proceed with the initiative. The summary of the analysis conducted is contained in **Appendix C** to Agenda Item 3 of this report.

4.25 In this regard, the following conclusion was approved:

<table>
<tr><td colspan="2">Conclusion SAM/IG/25-07</td><td colspan="2">Implementation of Space-based ADS-B under a regional technical cooperation project</td></tr>
<tr><td colspan="2">That the Secretariat:

a) Consult Trinidad and Tobago on their interest in participating in a potential regional implementation of Space-based ADS-B, together with Chile and Panama, initially;

b) Initiate the procedures, together with the Technical Cooperation Bureau (TCB), to enable the contracting of the service through Regional Project RLA/03/901; and

c) Organise an ad-hoc group under Regional Project RLA/03/901, with those States interested in participating in the regional implementation of Space-based ADS-B, for the drafting of the necessary documents for a potential contracting of the service.</td><td colspan="2">Expected impact:

☐ Political / Global
☒ Inter-regional
☒ Economic
☐ Environmental
☒ Technical/Operational</td></tr>
<tr><td colspan="4">Why:
Provide the States that expressed interest in the regional implementation of Space-based ADS-B with the necessary support for contracting the service.</td></tr>
<tr><td colspan="2">When:
Immediately</td><td colspan="2">Status:
Adopted by SAM/IG/25</td></tr>
<tr><td colspan="4">Who:
☐ Coordinators ☒ States ☒ ICAO SAM Secretariat ☒ TCB ☒ Other: Industry/Users</td></tr>
</table>

4.26 During the Meeting, a presentation was made on the mission of the Technical Cooperation Bureau, which provided support to States in improving their ability to comply with ICAO SARPS.

4.27 The TCB expressed its commitment to support States in the identification of needs, conduction of the necessary analyses, bidding processes, negotiations, contracting of whatever services were deemed necessary by the participating States, and integration with existing systems.

4.28 Regarding the proposal to implement Space-based ADS-B, IATA expressed its opinion on this matter, as reflected in **Appendix B** to this part of the report.

4.29 Other deliverables of the CNS/SUR Subgroup were: presentations by two air navigation service providers (COCESNA and Nav Canada) on their implementation of Space-based ADS-B, and a

presentation by uAvionix on the installation of ADS-B equipment on board of small aircrafts, at the first workshop/meeting of the Interop TF Subgroups (Virtual, 27-30 September 2020).

MET/IWXXM Subgroup

4.30 The MET/IWXXM Subgroup was activated to deal with matters related to the adaptation of systems to the new format of meteorological messages (IWXXM).

4.31 Two main initiatives were addressed by the MET/IWXXM Subgroup: a converter from the TAC format to the IWXXM format, called METAX, developed by personnel from Venezuela, and the adaptation of the Brasilia regional OPMET data bank by the adminsitration of Brazil.

4.32 The MET/IWXXM Subgroup held three meetings, where presentations were made on the two initiatives mentioned in the previous item. The participants also received information about the reference documents adopted, including Doc 10003 – *Manual on the ICAO meteorological information exchange model*, and EUR Doc 033 – *Guidelines for the implementation of OPMET data exchange using IWXXM in the EUR Region*.

INTEROP TF 2021 work plan

4.33 Following the discussions of the plenary, the events proposed to be carried out in 2021 in relation to the activities of the Interop TF were appoved, as shown in **Appendix C** to this part of the report.

IATA participation in GT INTEROP

4.34 IATA explained that is currently participating in the ATM/FPL Subgroup, and expressed interest in also collaborating in the ATM/AIDC and CNS/SUR Subgroups.

4.35 The Secretariat emphasized that GT Interop bring together all parties wishing to collaborate and contribute to the Group's activities, and stated that an appropriate mean of approving IATA's application was a expression of the Coordination Core. Uruguay, Brazil, Peru, Chile and Bolivia supported IATA's participation in the above subgroups, so it was accepted. IATA thanked the Secretary for the guidance and the Meeting for the support received.

****

APPENDIX A

International Civil Aviation Organization

ATM/FPL ROADMAP

SAM Region

Lima, October 2020
Version 1.1

Introduction

The ATFM/FPL Subgroup Roadmap was developed by the ATM/FPL Subgroup. The purpose of this roadmap is to provide guidance to the main stakeholders of the aeronautical community, to plan the development of the presentation of standardized messages using the AFTN/AMHS, resulting in minimizing duplication/multiplicity and errors in flight plans.

The main stakeholders in the aeronautical community that benefit from this roadmap are:

- The operators and users of the airspace.
- Air navigation service providers.
- International organizations.

The effective and homogeneous flow of air traffic through the FIR boundaries IR is achieved, in part, by securing flight plans and transmitting, processing and transferring associated messages among the FIRs in a homogeneous, efficient and consistent manner.

The methods and procedures used to present and/or originate flight plans have a residual effect on the quality of the air traffic services provided. Introducing duplicate or multiple flight plans, or flight plans that contain erroneous information, has a direct impact on the safety and efficiency of flights within the aeronautical system of the global airspace.

The AMHS is an aeronautical message handling system, designed for the exchange of information between providers of air traffic services and users. This achieves the significant reduction of errors and the duplication/multiplicity of flight plans in ATS systems.

In its initial applications, the user presented flight plans physically in the ARO offices, with the ARO Specialist being in charge of receiving, reviewing, approving and transmitting the flight plans to the automated systems and the respective aeronautical community. For airlines that comprise a greater number of flights with itineraries, the facility was provided to present Repetitive Flight Plans (RPL), but as a result of large amounts of modifications in flight data due to the complexities of operations, there were observed a greater number of errors and duplication/multiplicity of flight plans, and as a consequence, there were problems in the implementation of AIDC in the CAR/SAM Region and delays of flights on the ground.

In order to reduce errors and duplication/multiplicity of flight plans, consideration has been given to applying industry best practices (procedures certified through agreements at the ICAO NACC Office), delegating the reception of flight plans *via* AFTN/AMHS between ANSPs and users, as stipulated in ICAO Doc 4444, *Air Traffic Management*, Chapter 11, Part 11.2.1.1.1, whereby airlines capable of doing so take on the responsibility for the correct transmission of the flight plan and movement and control messages to all ATS units involved.

OBJECTIVE OF THE ATM/FPL ROADMAP

The following strategic objectives apply to the ATM/FPL roadmap for the SAM Region:

a) That the States, organizations and airlines of the SAM Region work together in the development of the new automated procedures for the transmission and reception of flight plans and standard messages.
b) Optimize the interoperability of automated systems among ANSPs and airlines.

c) Formation of a multi-operational group in each State where ATM, AIM, CNS personnel and collaborators from the aeronautical community participate.
d) Official use of new acknowledgment and rejection messages for standard ATS messages.
e) Preparation of common regulations and procedures in the SAM Region for the reception and transmission of flight plans in the AIP of each State.
f) Provide instruction to all aeronautical personnel involved in the treatment of flight plans (Pilots, Aircraft dispatchers, ATM, AIM and CNS personnel).
g) Creation of the flight plan processing unit in each State for the reception, review and transmission of standard ATS messages with the airlines.

Principles of ATM/FPL implementation

The implementation of ATM/FPL procedures in the CAR/SAM Region will be based on the following principles:

a) Development of a collaborative decision-making process (CDM), based on the concepts of teamwork, transparency, trust and communication in a pragmatic way.
b) Taking full advantage and use of the existing automated systems of each State and collaboration of aeronautical operators to meet the objectives sought by ICAO in the BBB (Basic Building Block).
c) Necessary coordination to make all possible efforts to make the best use of the systems and facilitate the system interconnection with the aeronautical operators.
d) Updating of the regulations by each State on the presentation of flight plans via AMHS/AFTN for publication purposes in the AIP.

ANSPs are encouraged to collaborate with state regulators to review and align existing regulations with emerging technologies. In cases where state regulations require the FPL to be hand-delivered along with the electronic FPL, modifications to these regulations can reduce inadvertent human-induced discrepancies in the filing process.

During this process, ANSPs should initiate appropriate quality control measures to reduce the possibility of disparity between electronic and hand-delivered FPLs. This manual procedure should remain as one of the contingencies available to users or to those users who do not have the acquired capacity.

Supplementary flight plan information (FPL box 19)

The supplementary flight plan information should not be considered to be transmitted by each FPL. When for SAR reasons, this information is required by any ANSP (according to Annex 11, part 5.2.2.1), the following sequence to acquire the information would be:

a) Via VHF, requested to the flight crew, if the event is considered by ATC, as an appropriate action, or

b) By telephone, by contacting the operation/flight dispatch unit of the designated airline 24/7 (in accordance with coordination with each user for delegation of the FPL) or
c) Via AMHS/AFTN to the operation/flight dispatch unit of the designated airline 24/7 through an SPL.

ATM/FPL development strategy by each State

The reception and transmission of flight plans via AFTN/AMHS will consist of three phases:

Initiation phase:

a) Formation of a multi-operational group for each State, involved in the processing of flight plan data.

   1) Authorities, company representatives and ANSP.
   2) ATM, CNS and AIM staff

b) Designation of a collective address (Distribution List - DL) for receiving flight plans via AFTN/AMHS (XXXXZPZX).

   1) The collective address (DL) must have the following addresses:

      - YYYYZAZX
      - YYYYZRZX

   2) The transmission of flight plans must be directed by the airline besides the collective address to the following addresses:

      - Departure aerodrome (ZTZX, YOYX)
      - Arrival aerodrome (ZTZX, YOYX)
      - Alternate aerodrome (ZTZX)

      To reduce FPL presentation discrepancies that result in aeronautical message addressing errors, ANSPs should designate their AMHS/AFTN addressing requirements in their Aeronautical Information Publication (AIP). Guidance related to the addressing of AMHS/AFTN messages is also available in ICAO Annex 10, Volume II, Chapter 4 and in ICAO Doc. 7910 and 8585, and in the regional AMHS/AFTN routing directories of ICAO.

      Some automated systems may reject flight plans that do not have an alternate aerodrome as a destination. Consequently, some operators present alternate aerodromes when an alternate one is not required in order to avoid the flight plan from being rejected, resulting in the economic burden of having to carry additional and unnecessary fuel. Under no circumstances for legal safety and liability, should FPL treatment unit personnel add this or no parameters to the FPL on behalf of the operator without prior agreement and consent.

      ICAO Annex 6 *Aircraft Operations, Part 2* establishes exceptions to the requirements to present an alternative destination aerodrome. ANSPs should ensure that such alternative field is not a mandatory field for automated flight plan processing, especially for flights in transit to a destination in another FIR.

   3) Publication of the AIP regulation, referring to the FPL reception procedure via AMHS, it is recommended to start through an AIC, temporarily until changes are made in the general regulations for publication in ENR/AIP.

Instruction and testing phase:

1) An instruction plan for the FPL reception procedures via AFTN/AMHS must be carried out to all the operational personnel involved in each State.

- Standard message types (FPL, DLA, CHG and CNL)

ANSPs must specify in local agreements or in the AIP, the timeframes required to complete the sending of movement messages (DLA and CHG) for individual flights, for example, by means of a time parameter before the expected time of out of chocks (EOBT)

It is preferable to use a CNL and resubmit the FPL as an alternative to sending multiple change messages to the same FPL or multiple changes within it. The use of the type of message that best meets the operational need based on the limitations of its automated dispatch system, should be left to the decision of the airline.

To avoid multiple FPLs, airlines will only originate and transmit the FPL, if the ANSP has delegated this responsibility to the user in the AIP or AIC. ANSPs should take into account that not all airline FPL/ dispatch systems have the ability to modify AMHS addresses by flight phase, so during the publication phase, the user is asked to remove the ATS addresses described in the AIP (ARO, ACC, TWR, etc.). This could generate a total loss of airline FPLs for that FIR, therefore, this procedure is not recommended.

- Syntax and use of ACK and REJ messages. (see appendix)

- Procedures established by the State and ANSPs

ANSPs should ensure that the names of any published Standard Instrument Departure (SID) or Standard Instrument Arrival (STAR) procedure meet the naming requirements of ICAO Annex 11, *Air Traffic Service, Appendix 3* (especially with the maximum of 7 characters per procedure) in order to reduce the number of rejected flight plans.

ANSPs shall ensure that ATM systems are capable of correctly processing submitted flight plans that include SID and STAR as part of the route. To achieve this goal, the encoding used to identify SIDs or STARs in databases of ATM systems should be exactly the same as the official chart publications. In the CAR/SAM Region, they continue to have publications using TERPS criteria to identify “transitions” in procedures that are not compatible when naming a procedure in the ATM system database.

EXAMPLE:

- Problem: PELICAN LOBO transition (AIP letter publication) is not encodable in ATM system due to 7 character limit.
- Solution: 1: Limit nomenclatures to ICAO Annex 11 (regardless of the PANS or TERPS design criteria).

- Solution 2: Apply the technique described for FMS standard

- Solution 3: publish the same nomenclature/coding used in the database of the ATM system in aeronautical charts (ex: PELTLOB instead of PELICAN LOBO transition)

2) Workshops and meetings with airline personnel interested in the new procedures.

3) Carry out test protocols with users

   - Report sheet by ANSP
   - Performance report and report for each airline.

Implementation phase:

1) Establish communication with each airline through an AIC/NOTAM describing the focal points of the ANSP to reach an agreement on procedures until publishing the necessary information in the AIP of each State in the ENR part.
2) A contingency plan must be prepared and published in case the AMHS system does not respond.
3) Create the Flight Plans Treatment Unit, thus centralizing the information and creating adequate procedures.
4) Carry out a risk analysis of the flight plan reception procedures via AFTN/AMHS.

   ANSPs should consider establishing a reporting mechanism to provide regular feedback to IATA operators on the number and causes of flight plan rejection and errors.

   Additionally, ANSPs should consider holding periodic user/operator forums to discuss recurring discrepancies.

Flight plan processing unit (UTFPL)

ANSPs with one or multiple ATS centers may consider installing a central flight planning unit for the initial process and distribution of the FPLs. An example of central flight planning is provided by the EUROCONTROL initial flight plan specifications.

Studies carried out by EUROCONTROL and the European Commission determined that inconsistencies in the content of flight data held by different parties for the same flight process have a negative impact on the efficiency of operations within the European traffic management system.

According to the EUROCONTROL website, which defines the procedures and requirements for the provision, processing and distribution of flight plans in the pre-flight phase, the improvement in the consistency of flight planning data has contributed to making operations more homogeneous within the environment, improved operational safety and has also allowed new operational concepts to be defined by the ATM.

The Flight Plans Treatment Unit has the benefit for the ANSP and the operators, to have a single place for the treatment and correction of the FPLs in the FIR or territory, optimizing resources and facilitating communication between the operator and the personnel in charge of FPLs in the ANSP. There is the possibility of having alternatives (instead of AMHS) for the presentation of flight plans via the internet through a virtual flight plan platform. A validation process should be implemented to prevent the introduction of inaccurate data from movement messages.

These virtual platforms allow the direct presentation of the flight plan by pilots and/or companies operations centers, however, they are considered as the last alternative by airlines that have FP systems integrated to dispatch systems, due to operational safety policies, since the dispatcher could introduce inadvertent manual errors, such as occurs with the receipt of the FPLs physically when being transcribed by the ARO. In no case should this be arbitrarily considered by the ANSP as the main means for an operator with these characteristics; these virtual platforms should comply with minimum error-checking functions.

Appendix

ACKNOWLEDGMENT AND REJECTION message templates for flight plans ACK and REJ

All ARO Team personnel are informed that as of the date, the acknowledgment of receipt by means of ACK and REJ messages through the FDD - AIRCON2100 system, will be incorporated into the flight plan reception procedures. For this reason, this template has been developed that will serve as a guide for all ARO specialists at the Lima aerodrome.

Accepted Message (ACK):

In the event that the flight plan enters the FDD system directly via AMHS/AFTN, an ACK message will be transmitted from the ARO position.

Example:

Message Description: ACK FPL SPIM CMP124 SPJC 1645 MPTO

Type of response	= ACK
Type of message	= FPL
FIR emitting message	= SPIM
Flight ID	= CMP124
DEP Aerodrome	= SPJC
EOBT	= 1645
ARR Aerodrome	= MPTO

Rejected Message (REJ)

Description of the message: REJ FPL SPIM JBU1824 INCORRECT FL RVSM

FPL-JBU1824-IS
-A320/M-SWE3DFGHIM3RZ/SB1
-SPJC0359
-N464**F350** BTE2F BTE UV1 TRU UL780 EVRED/N0456F360 UL780
TBG/N0452F380 UL465 GCM UG448 IKBIX Y183 PEAKY DCT DVALL CURSO5
-KFLL534
-PBN/A1B1C1D1O1S2T1 NAV/RNVD1E2A1 SUR/260B DOF/190315
REG/N282JB EET/SEFG0110 SKED0156 MPZL0225 MKJK0345 MUFH0427
KZMA0501 SEL/AJKS CODE/AB4F5D

Type of response	= REJ
Type of message	= FPLFIR
FIR issuing message	= SPIM
Flight ID	= JBU1824
Rejection reason	= INCORRECT FL RVSM (PASTE FPL BELOW)

APPENDIX B

Regarding the SB ADS-B regional implementation proposal, IATA was of the opinion that:

- There is currently a significant infrastructure of ATS surveillance sensors in the Region that should be fully exploited instead of adding a second layer of surveillance layer (and its associated costs) with no identified benefits.

- The operational benefits that represented savings from direct flights and the assumptions considered require more analysis by air operators in order to contribute to the generic support of potential cost-benefit. It is necessary to deepen the operational application sought with the use of the SB ADS-B.

- It is necessary to carry out a robust cost-benefit analysis, containing the cost of supplying the SB ADB-B service, as well as the benefits based on the expected operational applications of the technology. During the discussion, IATA alerted on the missing analysis related to increases in navigation services or operating costs, that a regional implementation could have. IATA provided a conservative estimate of several million dollars that this widespread implementation could have in operators for the analysis to be taken into account by the Meeting.

- The proposed ATS surveillance solution must be integrated with the communication and navigation systems, with a view to making it possible to obtain the maximum benefit from the technology.

IATA has also highlighted the critical economic situation in the industry, indicating that the investment capacity of airlines and possibly ANSPs' will be severely affected. In this sense, IATA has recommended that scarce resources be invested in the maintenance of the system, mainly bearing in mind that the recovery of the industry will depend on supplying the ANS with the appropriate level.

APPENDIX C

2021 Work Plan of the GT Interop

Activities	Objectives / Deliverables	Tentative Dates
Activities for the development of VOL III of the CAR/SAM ANP.	Development of VOL III, participation of all SAM and CAR States. Use of the AN SPA, and filling out forms and template.	TBD Several meetings in virtual mode.
SAM/IG/26 Air navigation implementation priorities considered in GREPECAS programs, VOL III Regional ANP and Regional initiatives.	Continue with the activities of Implementation and execution and optimization under the studies of GESEA and GT Interop. (5 days)	Tentative Lima, Between September and December 2021
GT Interop/2 Second Meeting of the GT Interop Subgroups.	Face-to-face meeting of the participants of the GT Interop Subgroups, to consolidate the previous work, carried out virtually (teleconferences, exchange of electronic messages and text review), with the aim of finalizing the products and deliverables that will be presented to the SAM Region Implementation Group (SAM/IG). (4 days)	Tentative On-site: Second week August 2021 Virtual: First week July 2021
Instruction/AIDC Training	Training for the members of the AIDC Implementation teams of the States of the Region. (5 days)	Tentative On-site/Virtual: First semester 2021 Virtual:Second semester 2021
Seminar on Centralization of Flight Plan Management	Event to discuss technical, regulatory and administrative aspects for the centralization of flight plan management, in accordance with the ATM/FPL Roadmap, approved at the SAM/IG/25 Meeting. (4 days)	Virtual: First semester 2021

Activities	Objectives / Deliverables	Tentative Dates
COM AMHS/2 Second Workshop/Meeting of Supervisors/Operators of COM AMHS Centers of the SAM Region	This is an event for the exchange of information and experiences between the supervisors/operators of the COM AMHS Centers of the SAM Region. Review of routing tables. Review of Contingency Plans. (4 days)	Tentative On-site: First semester 2021 Virtual: Second semester 2021
Advanced AMHS Course	Training aimed at technical and operational staff who maintain and operate the AMHS system and are involved in the implementation of AMHS interconnections. (5 days)	Virtual Second semester 2021
Seminar/Workshop on ADS-B Implementation in the SAM Region	Seminar/Workshop on the ADS-B Implementation in the SAM Region with the attendance of airspace planners from the States and those responsible for the implementation of air navigation systems. Review of the ADS-B Implementation Guide for the SAM Region. (4 days)	Virtual Second semester 2021
Seminar/Workshop on adaptation of Aeronautical Meteorology Systems to the new IWXXM format	Event to discuss the adaptation of Aeronautical Meteorology Systems to the new IWXXM format and about conducting tests with the OPMET Bank of Brasilia. Event to present and make available the Interface Control Document (ICD) of version 3.0 of the OPMET Regional Data Bank of Brasilia. (3 days)	Virtual First semester 2021 (June)

Agenda Item 5: Other Business

5.1 Under this agenda item, the following papers were analysed:

a) IP/5.1 – *ATS/MET Agreements in cases of release of radioactive material* (presented by Bolivia);
b) IP/5.2 – *AIDC Implementation at the different ACC of the Argentina FIRs* (presented by Argentina);
c) IP/5.3 – *Preparation of a document: "Guidance for the Prevention and Health Protection due to COVID-19 for the Operational Personnel in the ANSP Units* (presented by Argentina);
d) IP/5.4 – *Measures developed for the mitigation of COVID-19 events in the ATS units of the Republic of Argentina* (presented by Argentina); and
e) IP/5.5 – *Implementation of A-CDM in the São Paulo - Guarulhos international airport* (presented by Brazil).

5.2 Given the virtual format of the Meeting and the time given to the sessions, it was indicated that the time for exposing each information papers was limited. Participants were urged from the first day of the meeting to become aware of the information submitted and to express, if applicable, their comments or requests for clarification to the concerned State or to the Plenary.

5.3 The information papers are available on the SAM/IG/25 Meeting website:

https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_EN.aspx?m=2020-RLA06901-SAMIG25

5.4 Information from the ATS/MET Agreements for cases of release of radioactive material, submitted by Bolivia, was registered in the follow-up to the SAM/IG Conclusions.

5.5 The Secretariat requested that the representatives of the Coordination Core (CC) update the list of participants from each active subgroup of the Interoperability Task Group (GT Interop). The Appendix to this part of the Report presents the list of CC participants and activated subgroups.

APPENDIX

GT INTEROP: LIST OF PARTICIPANTS
COORDINATION CORE AND ACTIVATED SUBGROUPS
(Updated, 4 November 2020)

Coordination Core (CC)

Argentina

- Moira Lidia Callegare, mcallegare@anac.gob.ar
- Diego Frigerio, dfrigerio@anac.gob.ar

Bolivia

- Jaime Yuri Alvarez Miranda, jalvarez@dgac.gob.bo

Brasil/Brazil

- Hebert dos Santos, heberths@decea.gov.br, Brasil

Chile

- Francisco Uzieda, fuzieda@dgac.gob.cl
- Héctor Patricio Ibarra Martínez, hibarra@dgac.gob.cl

Colombia

- Andrés Colmenares Rincón, andres.colmenares@aerocivil.gov.co

Ecuador

- Christian Alexis Ramos Tapia, christian.ramos@aviacioncivil.gob.ec

Panamá/Panama

- Daniel de Ávila, daniel.deavila@aeronautica.gob.pa

Paraguay:

- Víctor Morán Maldonado **(Relator),** vmoran@dinac.gov.py , moranchu@gmail.com

Perú/Peru

- Paulo César Vila Millones, pvila@mtc.gob.pe

Uruguay

- Isidoro Espalter, iespalter@dinacia.gub.uy

Venezuela

- Pending designation

ATM/AIDC Subgroup (activated during SAM/IG/24 meeting)

- **Rapporteur: Jorge Eduardo Merino Rodríguez,** jmerino@corpac.gob.pe, **Peru**
  - Diego Agüero, daguero@anac.gob.ar, Argentina
  - Sergio Vallone, svallone@anac.gob.ar, Argentina
  - Lucas Emiliano Fernández, lfernandez@eana.com.ar, Argentina
  - Antonio Enrique González, agonzalez@eana.com.ar, Argentina
  - Mario Cristian Correa, mcorrea@eana.com.ar, Argentina
  - Claudia Karina Leban, cleban@eana.com.ar, Argentina
  - Jaime Yuri Álvarez Miranda, jalvarez@dgac.gob.bo, Bolivia
  - Hebert dos Santos, heberths@decea.gov.br, Brasil
  - David Monteiro de Medeiros, davidmm@decea.gov.br, Brasil
  - Olavo Matos, olavomatosoomj@fab.mil.br, Brasil
  - Samuel Fagundes, samuelfagundes@ctcea.org.br, Brasil
  - Fabiano Tormena, tormenaft@fab.mil.br, Brasil
  - Reynaldo Carlos Dhein, dheinrcd@fab.mil.br, Brasil
  - Harlen Mejía Oliveros, harlen.mejia@aerocivil.gov.co, Colombia
  - Miguel Andrés Sánchez Algarra, miguel.sanchez@aerocivil.gov.co, Colombia
  - Adriana Murillo Sepúlveda, adriana.murillo@aerocivil.gov.co, Colombia
  - Teddy Denis, teddy.denis@aerocivil.gov.co, Colombia
  - Juan Carlos Forero, juan.forero@aerocivil.gov.co, Colombia
  - Wilbert Hernandez, Wilbert.hernandez@aerocivil.gov.co, Colombia
  - Pedro Domingo Pastrián Céspedes, ppastrian@dgac.gob.cl, Chile
  - Christian Vergara Leyton, cvergara@dgac.gob.cl, Chile
  - Gustavo de Jesús Cáceres Moraga, gcaceres@dgac.gob.cl, Chile
  - Jorge Alfredo Zúñiga Jibaja, jorge.zuniga@aviacioncivil.gob.ec, Ecuador
  - Juan Fernando Poalasín Narváez, juan.poalasin@aviacioncivil.gob.ec, Ecuador
  - Eugenio Espinoza Arellano, eugenio.espinoza@aviacioncivil.gob.ec, Ecuador
  - Serge Cupoli, serge.cupoli@aviation-civile.gouv.fr, Guyana Francesa
  - Mario Antonio Facey Howard, mario.facey@aeronautica.gob.pa, Panamá
  - Bernabé Rodríguez Martínez, bernabe.rodrigues@aeronautica.gob.pa, Panamá
  - Digno Nelson Cardozo González, nechicar@gmail.com, Paraguay
  - Diego Ramón Aldana Fernández, diegoaldana@gmail.com, Paraguay
  - Dante Hermógenes Samaniego Bilbao, dsamaniego@corpac.gob.pe, Perú
  - Giuliano Guzmán Vera, gguzman@mtc.gob.pe, Perú
  - Sady Orlando Beaumont Valdez, sbeaumont@mtc.gob.pe, Perú
  - Antonio Lupacchino, alupacch@yahoo.com.ar, Uruguay
  - Gabriel Fernandez, gabriel.fernandez@dinacia.gu.uy, Uruguay
  - Guillermo Facello, guillermo.facello@dinacia.gub.uy, Uruguay
  - Gustavo Turcatti, blantur@gmail.com, Uruguay
  - Sonia Berroteran, s.berroteran@inac.gob.ve, Venezuela
  - Edson Fagundes, egomes@atech.com.br, ATECH
  - Jairo Trindade, jtrindade@atech.com.br, ATECH
  - Cristian Seiji Gushi, cgushi@atech.com.br, ATECH
  - Nelson Eduardo Juarez Guevara, nesuarez@indracompany.com, INDRA
  - Rodrigo Antonio San Martin Muñoz, rasan@indracompany.com, INDRA
  - Julio de Souza Pereira, pereiraj@iata.org, IATA

ATM/FLP Subgroup (activated during SAM/IG/24 meeting)

- **Rapporteur: Juan Pablo Portilla Venero,** jportilla@corpac.gob.pe, **Perú**
  - Héctor Marcelo Cancinos, hcancinos@anac.com.ar, Argentina
  - Marcos Lemos, mlemos@anac.gob.ar, Argentina
  - Lucas Emiliano Fernández, lfernandez@eana.com.ar, Argentina
  - Malena Reinoso, mreinoso@eana.com.ar, Argentina
  - Antonio González, agonzalez@eana.com.ar, Argentina
  - Paola López, palopez@eana.com.ar, Argentina
  - Silvia García, sgarcia@eana.com.ar, Argentina
  - Hebert dos Santos, heberths@decea.gov.br, Brasil
  - Jorge Alfredo Zúñiga Jibaja, jorge.zuniga@aviacioncivil.gob.ec, Ecuador
  - Juan Fernando Poalasín Narváez, juan.poalasin@aviacioncivil.gob.ec, Ecuador
  - Eugenio Espinoza Arellano, eugenio.espinoza@aviacioncivil.gob.ec, Ecuador
  - Sara Siles La Rosa, ssiles@mtc.gob.pe, Perú
  - Mario Dávila, mdavila@dinacia.gub.uy, Uruguay
  - Graciela Monzillo, gmonzillo@dinacia.gub.uy, Uruguay
  - Julio de Souza Pereira, pereiraj@iata.org, IATA
  - Marco Vidal, vidalm@iata.org, IATA

CNS/AMHS Subgroup (activated during SAM/IG/24 meeting)

- **Rapporteur: Andrés Barboza,** abarboza@dinacia.gub.uy, **Uruguay**
  - Sergio Vallone, svallone@anac.gob.ar; Argentina
  - Marcos Lemos, mlemos@anac.gob.ar, Argentina
  - Antonio Enrique González, agonzalez@eana.com.ar, Argentina
  - Hernán Aguirre, haguirre@eana.com.ar, Argentina
  - Marcos Gonzalez, margonzalez@eana.com.ar; Argentina
  - Hernan Canna, hcanna@eana.com.ar, Argentina
  - Remigio Blanco, rblanco@aasana.bo, Bolivia
  - Marcelo Mello Fagundes, fagundesmmf@decea.gov.br, Brasil
  - Lucio Cavalcante, luciolac@fab.mil.br, Brasil
  - Robinson Quintero, robinson.quintero@aerocivil.gov.co, Colombia
  - Christian Vergara Leyton, cvergara@dgac.gob.cl, Chile
  - Darwin Manolo Yazbeck Sarmiento, darwin.yazbeck@aviacioncivil.gob.ec, Ecuador
  - Lauro Gallardo, lauro_gallardo@aviacioncivil.gob.ec, Ecuador
  - Mortimer Salisbury, mbsalisbury2000@yahoo.com, Guyana
  - Serge Cupoli, michel.areno@aviation-civile.gouv.fr, Guyana Francesa
  - Daniel De Ávila, deavila@aeronautica.gob.pa, Panamá
  - Abdiel Vásquez, abvasquez@aeronautica.gob.pa, Panamá
  - Víctor Morán Maldonado, moranchu@gmail.com, Paraguay
  - Juan Félix Estigarribia, jfe@gmail.com, Paraguay
  - Jorge García Villalobos, jgarcía@corpac.gob.pe, Perú
  - Raúl Anastacio Granda, ranastacio@corpac.gob.pe, Perú
  - Giuliano Guzmán Vera, gguzman@mtc.gob.pe, Perú
  - Mitchell Themen, mickiano@live.com, Surinam
  - Henry Díaz, hdiaz@dinacia.gub.uy, Uruguay

- Oscar Faria, oscar.faria@dinacia.gub.uy, Uruguay
- Sabrina Rodríguez Medina, sa.rodriguez@inac.gob.ve, Venezuela
- Maricel Berroterán Quijada, maricel.berroteran@inac.gob.ve, Venezuela

CNS/SUR Subgroup (activated during SAM/IG/24 meeting)

- **Rapporteur: Ricardo Abregu,** rabregu@anac.gob.ar, **Argentina**
  - Leonardo Gonzalez, lgonzalez@anac.gob.ar, Argentina
  - Mario Cristian Correa, mcorrea@eana.com.ar, Argentina
  - Lucas Emiliano Fernandez, lfernandez@eana.com.ar, Argentina
  - Jorge Orbegozo, jorbegozo@eana.com.ar, Argentina
  - Gustavo Escalante, guflores@eana.com.ar, Argentina
  - Jaime Yuri Álvarez Miranda, jalvarez@dgac.gob.bo, Bolivia
  - José Izidro Apolinario, izidrojia@decea.gov.br, Brasil
  - Alfonso De la Vega Sepúlveda, adelavega@dgac.gob.cl, Chile
  - Luis Abelardo Díaz Mateus, luis.diaz@aerocivil.gov.co, Colombia
  - Henry Andrés Cordoba Maldonado, henrya.cordoba@aerocivil.gov.co, Colombia
  - Christian Ramos, christian.ramos@aviacioncivil.gob.ec, Ecuador
  - Rosaura Reyes, rosaura.reyes@aviacioncivil.gob.ec, Ecuador
  - Cristino Vargas, cristino.vargas@aeronautica.gob.pa, Panamá
  - Jorge Herreros Domínguez, jorgeherrerosdominguez@hotmail.com, Paraguay
  - David Ricardo Torres Jacqet, dtorres33@gmail.com, Paraguay
  - Giuliano Guzmán Vera, gguzman@mtc.gob.pe, Perú
  - Jorge García Villalobos, jgarcía@corpac.gob.pe, Perú
  - Johnny Carlos Ávila Rojas, javila@corpac.gob.pe, Perú
  - Mario Luis Matos Rivera, mmatos@corpac.gob.pe, Perú
  - Andrés Braida, abraida@dinacia.gub.uy, Uruguay
  - Tabaré Sardeña, tsardena@dinacia.gub.uy, Uruguay
  - Francisco Javier Ascanio Cerdeño, francisco.ascanio@inac.gob.ve, Venezuela
  - Ana Persiani, ana.persiani@aireon.com, AIREON
  - Demetrius Zuidema, demetrius.zuidema@aireon.com, AIREON
  - Athayde Frauche, athayde.frauche@aireon.com, AIREON
  - Julio de Souza Pereira, pereiraj@iata.org, IATA

MET/IWXXM Subgroup (activated during SAM/IG/24 meeting)

- **Rapporteur: Wallace Gutemberg M. Luz,** gutemberggwgml@decea.gov.br**, Brazil**
  - Jose Luis Saucedo, jsaucedo@anac.gob.ar, Argentina
  - Sergio Vallone, svallone@anac.gob.ar, Argentina
  - Roxana Vasques Ferro, rvasques@anac.gob.ar, Argentina
  - Claudia Ribero, cribero@smn.gov.ar, Argentina
  - Rodrigo Cortes, rcortes@smn.gov.ar, Argentina
  - Hernán José Aguirre, haguirre@eana.com.ar, Argentina
  - Antonio Enrique González, agonzalez@eana.com.ar, Argentina
  - Marcos Gonzalez, margonzalez@eana.com.ar, Argentina
  - Malena Reinoso, mreinoso@eana.com.ar, Argentina

- Daniel Cortes, dcortes@eana.com.ar, Argentina
- Martim Matshchinske, martim@ciscea.gov.br, Brasil
- Antonio Vicente Pereira Neto, pereiraavpn@fab.mil.br, Brasil
- Lucio Calvalcante, luciolac@fab.mil.br, Brasil
- Freddy A. Reina, freddy.reina@aerocivil.gov.co, Colombia
- Juan C. Pulido, juan.pulido@aerocivil.gov.co, Colombia
- Arturo Loma, gabriel.lomas@aviacioncivil.gob.ec, Ecuador
- Edison Lagos, edison_lagos@yahoo.com, Ecuador
- Marcelo Hidalgo, m_hidalgo@aviacioncivil.gob.ec, Ecuador
- Raúl Anastacio Granda, ranastacio@corpac.gob.pe, Perú
- Fernando Mestanza Hernández, fmestanza@corpac.gob.pe, Perú
- Hugo Rosado Soto, hrosado@mtc.gob.pe, Perú
- Antonio Espinoza, antonio.espinoza07@gmail.com, Venezuela
- Sabrina Rodriguez, sa.rodriguez@inac.gob.ve, Venezuela
- Maricel Berroteran, maricel.berroteran@inac.gob.ve, Venezuela
- Antonio Dias, adias@atech.com.br, Atech
- Kaori Yamaguchi, kyamaguchi@atech.com.br, Atech
- Mariana Panzarini Marques, mmarques@atech.com.br, Atech