INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Regional Office

Workshop on the implementation of the aviation system block upgrades (ASBU) and the alignment of regional and national performance-based air navigation systems implementation plans

SUMMARY

Lima, Peru, from 14 to 18 August 2017

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of ICAO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

TABLE OF CONTENTS

i - Table of contents 1

ii - History 1
Place and duration of the event 1
Opening ceremony and other matters 1
Schedule, organization, working methods, officers and Secretariat 1
Working languages 1

1 Summary of the workshop 2

2 Summary of the presentations 2

2 Results / recommendations 6

Appendix A: Agenda

Appendix B: List of participants

HISTORY

ii-1 PLACE AND DURATION

The Workshop on the implementation of the aviation system block upgrades (ASBU) and the alignment of regional and national performance-based air navigation systems implementation plans was held at the ICAO South American Regional Office, Lima, Peru, from 14 to 18 August 2017.

ii-2 OPENING CEREMONY AND OTHER MATTERS

Mr. Franklin Hoyer, Regional Director of the ICAO South American Office, greeted the participants and acknowledged their continuous support to the regional activities undertaken by the South American Regional Office, as well as the continuous support of civil aviation authorities of the South American Region.

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

The Workshop was conducted from 09:30 to 15:30 hours.

Mr. Onofrio Smarrelli, ICAO SAM CNS RO, featured the Workshop Secretariat assisted by and Mr. Saulo Da Silva, Chief, Global Interoperable System and Miss Olga De Frutos, Associate Technical Officer ANB/SAF/PCI from ICAO HQ (Montreal, Canada), Mrs. Veronica Chavez, TAO, Mr. Jorge Armoa, AIM/MET RO, Mr. Fabio Salvatierra, AGA RO, Mr. Fernando Hermoza, ATM/SAR RO and Mr. Roberto Sosa ANS/SFTY RO from ICAO SAM Office.

ii-4 WORKING LANGUAGES

The working languages of the event were Spanish and English, with simultaneous interpretation services.

ii-5 AGENDA

The agenda is contained in Appendix A to this summary.

ii-6 ATTENDANCE

The event was attended by 28 participants from 8 SAM States (Argentina, Bolivia, Brazil, Chile, Panama, Paraguay, Peru and Venezuela), one NAM State (United States) as well as representatives from ATECH, IATA AND THALES ALENIA SPACE. The list of participants appears in **Appendix B.**

1 SUMMARY OF THE WORKSHOP

1.1 Objectives

1.1.1 The objectives of the workshop were as follows:

- Allow the participants to understand the air navigation performance planning process, based on the Manual on global performance of the air navigation system (Doc 9883) and the ASBU framework as part of the Global air navigation plan (GANP).

- Review the Performance-based air navigation implementation plan for the SAM Region (PBIP), especially the regional performance objectives and their alignment with the key performance indicators contained in the 5th edition of the Global air navigation plan (GANP) and the regional performance indicators.

- Define the data/inputs that must be provided by States and users for monitoring the agreed key performance indicators (KPIs).

1.2.2 The eighteen presentations made during the workshop are posted in the following website: https://www.icao.int/SAM/Pages/MeetingsDocumentation.aspx?m=2017-ASBU

2 SUMMARY OF WORKSHOP PRESENTATIONS

2.1 The workshop was divided into six sessions. Session 0 was an introduction to the event, with a description of the objective, agenda, schedule and administrative aspects of the workshop. Three presentations were made in session 1, *Introduction: Global air navigation plan (GANP) and ASBU,* one in session 2, *Performance management associated to the ASBU framework,* four in session 3, *Technology roadmap associated with the ASBU framework,* and nine in session 4, *Global, regional and national planning.* In session 5, the results and recommendations of the workshop were presented.

SESSION 1: INTRODUCTION: GLOBAL AIR NAVIGATION PLAN (GANP) AND ASBU

PRESENTATION 1: GLOBAL AIR NAVIGATION PLAN (GANP) AND AVIATION SYSTEM BLOCK UPGRADES (ASBU) (ICAO HQ)

2.2 The purpose of this presentation was to level the field in terms of knowledge about the GANP and ASBU and their operational impact. It was noted that the GANP was a strategic document for planning air navigation improvements at global, regional and national level, covering the following disciplines: ATM, CNS, AGA, AIM and MET. The GANP offered a long-term vision to assist the entire aeronautical community, ensuring continuity and harmonisation amongst modernisation programmes.

2.3 The last edition of the GANP (V) was endorsed by the A39 (September 2016), and introduced very few changes with respect to the fourth edition, published in 2013, which introduced the Aviation System Block Upgrades (ASBU) framework. A new edition is foreseen for 2019, which will have a multi-layered structure: executive, global, regional and national.

2.4 Operational improvements are organised in the ASBU. ASBU is a global operational framework that allows all member States to improve their air navigation capabilities based on their operational requirements. The operational improvements described in the ASBU are not mandatory and

do not have to be implemented everywhere, only in operational scenarios where performance needs to be improved. The following ASBU-related terms were defined: threads, elements, modules and blocks.

2.5 The most important message of the GANP is that we must work together at all levels if we want to achieve the system that we need to meet the expectations of the aeronautical community. How to measure expectations? Through performance. How to achieve performance? By offering services. How to offer services? Through deployment (ASBU, GANP).

QUIZ ON ASBU

2.6 A quiz on ASBU was taken to see if the participants had understood the ASBU framework and its components (threads, elements, enablers, modules, and blocks).

PRESENTATION 2: ASBU BLOCK 0 (ICAO HQ)

2.7 The 18 modules of Block 0 were briefly explained. Block 0 started in 2013 when ICAO standards, procedures and regulations, and the ground and airborne technology were already available for the implementation of the elements.

PRESENTATION 3: AIRLINE REQUIREMENTS: "OBTAINING OPERATIONAL IMPROVEMENTS" (IATA)

2.8 In this presentation, IATA highlighted the need for States, when developing their national air navigation plan, to incorporate the airspace concept (see ICAO Doc 9992). This concept was based on implementation of different phases: planning, design, validation, implementation and review. It was also noted that airlines did not need States to implement ASBU (including PBN) unless it brought operational improvements. IATA also stressed the importance of engaging users in the development of air navigation plans.

SESSION 2: PERFORMANCE MANAGEMENT PROCESS ASSOCIATED WITH THE ASBU FRAMEWORK

PRESENTATION 4: PERFORMANCE-BASED DECISION-MAKING METHOD (ICAO HQ)

2.9 This presentation described the performance-based decision-making method, which included various procedures to meet the expectations of the aeronautical community, improving the performance of the air navigation system and optimising the allocation and use of available resources. The decision-making method was based on three important aspects:

- Strong focus on the desired/required results.
- Reliance on facts and data for decision-making.
- Justified collaborative decision-making.

The method comprises 6 steps:

1. Scope, context, overall aspiration, and expectations
2. SWOT analysis/set of objectives
3. Set of goals/calculation of requirements
4. Identification of the optimum solution

5. Deployment of the optimum solution
6. Assessment results

2.10 When preparing their national air navigation plans, States should apply the performance-based decision-making method.

2.11 The participants had the opportunity to do exercises related to each of the stages of the performance-based decision-making method.

SESSION 3: TECHNOLOGY ROADMAP ASSOCIATED WITH THE ASBU FRAMEWORK

PRESENTATION 5: TECHNOLOGY ROADMAP (ICAO RO)

2.12 Information was provided on the global roadmap for communication systems (ground-air datalink, ground-ground data communications, and ground-air voice communications), navigation systems, surveillance systems (ground, air-air), information management systems (IM), and avionics, as described in the GANP. Information was provided on the relationship between module elements and the technological systems in the different blocks. Medium- and long-term plans for navigation and surveillance infrastructure in the SAM Region were also presented. Information was also provided on the importance of protecting the existing radio frequency spectrum and supporting the ICAO position at ITU global radio frequency conferences to secure the frequencies required for the future technological applications described in the technology roadmap of the GANP.

PRESENTATION 6: CONSIDERATIONS OF THE INDUSTRY ON ASBU (THALES)

2.13 In this presentation, Thales informed that it was a member of ICCAIA (International Coordinating Council of Airspace Industries Associations), an international organisation recognised by ICAO that participates as observer in ICAO committees and panels, such as the ASBU Panel Project Team and the ATM RPP (ATM Requiremet Performance Panel).

2.14 Thales also noted that it would be participating at the Second global air navigation industry symposium (GANIS/2) to be held in ICAO Headquarters in Montreal in December 2017. Thales noted that it meets the requirements of the enablers of the elements contained in ASBU Blocks 0 and 1 modules through its products TOPSKY ATC, TOPSKY TWR, ECO system and MAESTRO AMAN/DMAN. It also informed that, together with EUROCONTROL, the FAA, different users (SWISS, QANTAS, Brussels Airlines) and ANSPs (DKR, ATNS, AIRSERVICES, and SID), it had participated in global interoperability pre-operational demonstrations for FF-ICE.

PRESENTATION 7: CONSIDERATIONS OF THE INDUSTRY ON ASBU (ATECH)

2.14 ATECH compared what was included in some of the modules of ASBU Block 0 with what was already implemented in ATECH automation products, such as the ATECH ATM/ATFM system. It also presented the update planned for the ATECH ATM/ATFM system in 2018, which would cover some of the modules in Block 1. It was noted that ATECH, together with DECEA, had participated in the FAA Mini Global II SWIM demonstrations and the SESAR SWIM Global demostration. Furthermore, ATECH informed that it had signed an agreement with EUROCONTROL in 2015 for the exchange of pre-departure flight plans. In 2017, ATECH started the installation of SWIM at DECEA.

COMMENTS ON THE PRESENTATIONS BY THE INDUSTRY

2.15 In order to ensure the interoperability of its automated systems, it was felt that the industry should organise forums on this topic in view of the problems that currently existed for achieving interoperability, as in the AIDC, and possible problems for achieving interoperability of future automated systems (FF-ICE, SWIM, etc). Likewise, participation in operational demonstrations such as FF-ICE and Mini Global II would support interoperability between the different automated systems.

PRESENTATION 8: BLOCK 0 TO BLOCK 1 (ICAO HQ)

2.16 This presentation stressed the fact that in order to achieve a globally interoperable air traffic management system during all flight phases and for all users, it was necessary to comply with the agreed levels of safety, provide cost-effective and environmentally sustainable operations, and meet security requirements. A description was made of the 17 modules of Block 1 and the operational improvements that would result from their implementation.

SESSION 4: GLOBAL, REGIONAL, AND NATIONAL PLANNING

PRESENTATION 9: ALIGNMENT OF NATIONAL, REGIONAL, AND GLOBAL PLANS (ICAO HQ)

2.17 In this presentation, information was given on the interaction among global, regional, and national plans. In this sense, the following aspects were summarised:

2.17.1 Based on the GANP, regional and national planning processes should be aligned and used for identifying those elements that would better meet the operational requirements identified. Implementation parameters, such as the complexity of the operational environment, constraints, and available resources, will impact the development of regional and national implementation plans aligned with the GANP.

2.17.2 This planning requires the interaction and cooperation amongst stakeholders, regulators, airspace users, air navigation service providers (ANSPs), aerodrome operators, and the industry in order to obtain their commitment to implementation.

2.17.3 Implementations at global, regional, sub-regional, and ultimately, at State level, must be considered as part of the global and regional planning process of GREPECAS. Consequently, implementation arrangements, including effective dates, can be collectively agreed and applied by all stakeholders.

2.17.4 When drafting national plans, there is no simple solution or standard form. National requirements must be verified against the operational environment, priorities must be defined, plans must be aligned with the GANP, the ASBU framework, and the Regional Plan, and system improvement options must be defined.

PRESENTATION 10: REGIONAL AIR NAVIGATION PLAN (eANP) (ICAO RO)

2.18 Information was provided on the content, function and development of air navigation plans. Background information was provided on the CAR/SAM Air Navigation Plan (Doc 8733) and its evolution to the eANP (Electronic Air Navigation Plan), which is presented in electronic format, in three volumes. At present, Volumes 1 and 2 have been approved, while the volume on ASBU is expected to be ready by 2018. In the meantime, during the transition to Volume III for the SAM Region, consideration

will be given to the Performance-based air navigation systems implementation plan (PBIP) for the SAM Region in accordance with GREPECAS Decision PPRC/4-3.

PRESENTATION 11: PERFORMANCE-BASED AIR NAVIGATION SYSTEMS IMPLEMENTATION PLAN (PBIP) FOR THE SAM REGION

2.19 Background information was presented concerning the implementation of the Performance-based air navigation systems implementation plan (PBIP) for the SAM Region and its evolution. A new version of the PBIP (Version 1.5) was presented with the changes resulting from the status of implementation of ATM, CNS, AIS, AGA and MET systems, as well as the new version of the GANP (5th edition) and planning for air navigation support systems for the 2017-2023 period. The participants conducted an initial review of changes made to the PBIP. In this regard, it was felt that the new version of the PBIP should be circulated to all the States of the Region for a more thorough review.

PRESENTATION 12: NATIONAL AIR NAVIGATION PLAN OF BRAZIL

2.20 A presentation was made of the National Plan of Brazil, called Sirius, and its relationship with ASBU modules. Information was provided on the challenges faced by the Sirius programme, such as the integration of the SMS with the ATM planning process, the drafting of a CDM methodology, the adoption of project management best practices, the establishment of a governance programme, the establishment of a performance-based programme with operational indicators to measure performance, the analysis of ANS services, infrastructure, and human performance, the conduction of a cost-benefit analysis, the forecasting of future ATM system demand, and the harmonisation with other plans.

PRESENTATION 13: NATIONAL AIR NAVIGATION PLAN OF CHILE

2.21 A presentation was made of the Institutional Air Navigation Plan (PNAI), which was developed taking into account the guidelines of the Global Air Navigation Plan (GANP) contained in the 5th edition of Doc 9750 (2016), as approved by the International Civil Aviation Organization (ICAO) in its Assembly of October 2016 (A-39), and the Performance-based air navigation systems implementation plan (PBIP) for the SAM Region, and is aimed at the implementation of air traffic management (ATM) as agreed by ICAO contracting States. The plan incorporates the performance-based navigation (PBN) concept and its alignment with the Aviation System Block Upgrades (ASBU) methodology. At national level, the objective of the plan is to encourage the implementation of a national air traffic management system that will permit aircraft operators to comply with their intended departure and arrival schedules and maintain their preferred flight profiles with minimum restrictions and without compromising the agreed levels of safety. The plan also has an institutional objective, which is to serve as a guide for the replacement and upgrading of navaids, the establishment of goals for the development of specific capabilities, and for reaching the highest level of interoperability and harmonisation among sub-systems in order to achieve an integrated national ATM system. The plan covers the 2017-2020 period.

PRESENTATION 14: NATIONAL AIR NAVIGATION PLAN OF COLOMBIA

2.22 Colombia did not participate in the workshop but sent a presentation concerning its air navigation plan, called PNA COL. The PNA COL consists of three volumes: Volume 1 contains the operational requirements and was published on 7 September 2014; Volume 2 refers to Facilities and Services and was published on 7 May 2016; and Volume 3, on Regulations, was published on 1 September 2014. Volumes 1 and 2, covering the 2017-2030 period, have been updated. The PNA COL covers the modules in Blocks 0, 1, 2 and 3, linking them to the elements of the ATM operational concept and the 11 key performance areas (KPAs). The presentation contains information on the development of indicators for the KPAs.

PRESENTATION 15: NATIONAL AIR NAVIGATION PLAN OF VENEZUELA

2.23 An explanation was given of the Performance-based air navigation plan of Venezuela for the 2015-2023 period. The plan is being applied in the Maiquetia flight information region (FIR). In order to achieve the objective of the plan, consideration was given to the development of three approaches: a frame of reference, operational requirements and facilities and services. The plan started to be developed on 25 August 2015, with the assistance of the ICAO SAM Office. The objective of the plan was to achieve a more efficient and interoperable airspace to safely meet future capacity requirements, increase the capacity of air traffic management systems, optimise aerodrome operations and further the transition from AIS to AIM, optimise airspace, reduce CO2 emissions, and implement new ATM automated systems. The plan contemplates the participation of the following aeronautical community stakeholders: air navigation service providers, airport service providers, aeronautical authorities, and airspace users. The plan takes into account the ASBU Block 0 modules to be implemented.

PRESENTATION 16: FAA ASBU IMPLEMENTATION STATUS

2.24 A presentation was made on the improvements to be provided by NEXGEN to current systems, including radar, inefficient routes, voice communications, differing information, fragmented weather forecasts, and restricted visibility. The National Airspace System (NAS) was presented, which covers the period from 2014 to 2025 and beyond. Information was provided on the status of implementation of the 63 elements of the 18 Block 0 modules. Version V of the GANP increased the number of Block 0 elements from 63 to 69. It was noted that ASBU should be simple, easy to understand and relevant.

PRESENTATION 17: MAKING THE PLANET A BETTER PLACE TO LIVE (IATA)

2.25 IATA explained some facts regarding fuel consumption, stressing the need to count in seconds rather than in minutes. It also explained the concepts of Minimum Time Track, Minimum Cost Track, and Cost Index. The implications of consumption on each flight phase were described as an introduction to a case study on potential savings, which involved the application of concepts such as the savings calculation method, continuous descent operations, and ATFM.

3 RESULTS/RECOMMENDATIONS

3.1 Regional operational requirements should be analysed using the performance-based decision-making method, in order to define specific performance objectives at a regional level and identify the associated performance indicators, so as to facilitate measurement of performance benefits in the PBIP.

3.2 At the next meeting of the Coordination Committee of Project RLA/06/901 to be held on the week of 2 October 2017, the Secretariat should submit for approval:

- The conduction of a workshop on performance indicators on the second half of 2018.
- The development of a process to collect the data required for calculating the performance indicators contemplated in the PBIP, as well as of a simple tool to facilitate such calculation and its display.

3.3 The ICAO section in charge of updating and drafting the GANP should prepare a form containing information to assist States in the drafting of their national plans aligned with the GANP and the regional plans.

3.4 Those States that have not yet completed or updated their national air navigation plan aligned with the GANP and the PBIP should do so in order to comply with GREPECAS Conclusion 17/6 *Follow-up on the implementation of A38 resolutions regarding air navigation.*

3.5 The Secretariat should circulate the PBIP amongst the States of the Region, in order to receive their comments no later than 13 October 2017.

APPENDIX A

INTERNATIONAL CIVIL AVIATION ORGANIZATION
SAM REGIONAL OFFICE

Workshop on the implementation of the aviation system block upgrades (ASBU) and the alignment of regional and national performance-based air navigation systems implementation plans

(Lima, Peru, 14 -18 Augusto 2017)

AGENDA

Date/Time	Lead	Topic	Objective
DAY 1	Monday, 14 August		
INTRODUCTION: GLOBAL AIR NAVIGATION PLAN AND ASBU FRAMEWORK			
8:30 - 9:00		Registration	
9:00 - 9:30		Opening ceremony Photo group	
9:30 - 10:00		Welcome, Introductions and workshop objectives and expectations	
10:00 - 10:30	*Break*		
10:30 - 11:00	ICAO HQ	ASBU Test	
11:00 – 12:30	ICAO HQ	Global Air Navigation Plan (GANP) and the Aviation System Block Upgrade (ASBU) Framework	
12:30 - 13:30	*Lunch*		
13:30 - 14:30	All	Test Result	
14:30 - 15:30	ICAO HQ	ASBU BLOCK 0	
DAY 2	Tuesday, 15 August		
9:00 - 9:30	IATA	Airline Requirements	
PERFORMANCE MANAGEMENT PROCESS ASSOCIATED WITH THE ASBU FRAMEWORK			
9:30 - 10:30	ICAO HQ All	Performance - based Decision - making Method	
10:30 - 11:00	*Break*		
11:00 - 12:30	All	Performance - based Decision - making Method (Cont.)	
12:30 - 13:30	*Lunch*		
13:30 - 15:30	All	Performance - based Decision - making Method (Cont.)	

DAY 3	Wednesday, 16 August		
CONTINUATION PERFORMANCE MANAGEMENT PROCESS ASSOCIATED WITH THE ASBU FRAMEWORK			
9:00 - 10:30	All	Performance - based Decision - making Method (Cont.)	
10:30 - 11:00	*Break*		
11:00 - 12:30	All	Performance - based Decision - making Method (Cont.)	
12:30 - 13:30	*Lunch*		
TECHNOLOGY ROADMAPS ASSOCIATED WITH THE ASBU FRAMEWORK			
13:30 - 14:00	ICAO RO	Roadmap on Technology - C, N, S, Avionics and IM	
14:00 - 14:30	Thales	ASBU industry consideration Roadmap on Technology	
14:30 - 15:00	Atech	ASBU industry consideration	
15:00-15:30	ICAO HQ	Block BO to Block B1	
DAY 4	Thursday, 17 August		
GLOBAL, REGIONAL AND NATIONAL PLANNING			
9:00 - 9:30	ICAO HQ	Alignment of National, Regional and Global Plan	
9:30 - 10:00	ICAO RO	Regional electronic Air Navigation Plan (e-ANP)	
10:00-10-30	ICAO RO	Air Navigation System Performance-Based Implementation Plan for the SAM Region (PBIP)	
10:30 - 11:00	*Break*		
11:00 - 12:30	ICAO RO All	Air Navigation System Performance-Based Implementation Plan for the SAM Region (PBIP)	
12:30 - 13:30	*Lunch*		
13:30 - 14:00	IATA	Making the world a better place to live (environment)	
14:00 - 15:00	US	ASBU implementation status	
15:00 -15:30	Venezuela	AIR NAVIGATION PLAN	
15:30 - 16:00	Brazil	AIR NAVIGATION PLAN	
DAY 5	Friday, 18 August		
9:00 - 9:30	Chile	AIR NAVIGATION PLAN	
9:30 - 10:00	All	Air Navigation System Performance-Based Implementation Plan for the SAM Region (PBIP)	
10:00 - 10:30	*Break*		
RESULTS AND RECOMMENDATIONS			
10:30 - 12:30	ICAO RO	Conclusions and recommendations Wrap up and feedback Closing	
12:30	*End of the meeting*		

LISTA DE PARTICIPANTES / LIST OF PARTICIPANTS

ARGENTINA

1. Ciro Luis Granea
2. Jorge Roberto Cornelio
3. Alfredo Iacono
4. Gustavo Chiri
5. Mabel Villaroel
6. Juan Pablo Duval
7. Nicolás Borovich

BOLIVIA

8. Reynaldo Cusi Mita
9. Jaime Yuri Alvarez Miranda

BRASIL / BRAZIL

10. Hygino Rolim
11. Davi Monteiro De Medeiros

CHILE

12. Jaime A. González

ESTADOS UNIDOS

13. Raúl Chong
14. Tanino Midori

PANAMÁ

15. Flor Silveira
16. Carlos Aparicio
17. Gilda Espinosa
18. Abdiel Vásquez
19. Raúl Samaniego

PARAGUAY

20. Liz Rocío Portillo
21. Erica Méndez
22. Sindulfo Ibarrola
23. Jhonny L. Colman Caballero

PERÚ

24. Sady Beaumont Valdez
25. Luis Luna Calderón
26. Victor Arturo Martínez Serna
27. Antonino Marquez Rondón

VENEZUELA

28. Johanna María Morales Herrera

ATECH

29. Edson Fagundes Gomes

IATA

30. Julio Pereira

THALES

31. Frédéric Cuq

OACI / ICAO

32. Saulo Da Silva
33. Olga de Frutos
34. Onofrio Smarrelli
35. Verónica Chávez
36. Jorge Armoa
37. Fernando Hermoza
38. Fabio Salvatierra
39. Roberto Sosa

LISTA DE PARTICIPANTES / LIST OF PARTICIPANTS

ARGENTINA

Ciro Luis Granea
Especialista ATS
Administración Nacional de Aeronáutica Civil
Buenos Aires, Argentina
Tel.: +5411 5941 3000
E-mail: cgranea@anac.gob.ar

Alfredo Iacono
Jefe Dpto. Comunicaciones
Dirección Nacional de Control de
Tránsito Aéreo (DNCTA)
Buenos Aires, Argentina
Tel.: +5411 5789 8432
E-mail: fabianiacono64@gmail.com

Gustavo Chiri
Jefe Departamento Panificación
Dirección Nacional de Control de
Tránsito Aéreo (DNCTA)
Buenos Aires, Argentina
Tel.: +5411 5789 8424
E-mail: gchiri@gmail.com

Jorge Roberto Cornelio
Jefe del Departamento Normativa ANS
Empresa Argentina de Navegación Aérea S.E.
Buenos Aires, Argentina
Tel.: +54114320 3956
E-mail: jcornelio@eana.com.ar

Mabel Cristina Villaroel
Jefe Dpto. ANS
EANA
Buenos Aires, Argentina
Tel.: +54297 5377 317
E-mail: mvillarroel@eana.com.ar

Juan Pablo Duval
Dirección Servicios de Navegación Aérea
Dirección Nacional de Control de
Tránsito Aéreo(DNCTA)
Buenos Aires, Argentina
Tel.: +54 2872 8238
E-mail: dsna@faa.mil.ar

Nicolás Borovich
Jefe Departamento de Planamiento
Empresa Argentina de Navegación Aérea (EANA)
Buenos Aires, Argentina
Tel.: +54 153119377
E-mail: nborovich@eana.com.ar

BOLIVIA

Reynaldo Cusi Mita
Director de Navegacion Aérea
Direccion General de Aeronautica Civil
La Paz - Bolivia
Tel.: +591 2 2114465
Cel.: +591 71576543
E-mail: rcusi@dgac.gob.bo

Jaime Yuri Alvarez Miranda
Jefe de la Unidad de Comunicaciones
Navegación y Vigilancia
Direccion General de Aeronautica Civil
La Paz – Bolivia
Tel.: +591 2 2444450 ext. 2651
E-mail: jalvarez@dgac.gob.bo

BRASIL / BRAZIL

Hygino Rolim
ATM Consulting
Departamento de Control del Espacio Aéreo (DECEA)
Avenida General Justo, 160, Castelo
Rio de Janeiro-RJ , Brasil
Tel: +5521 2101 6501
E-mail: hyginohlr@decea.gov.br

Davi Monteiro De Medeiros
Deputy of the ATS Sector DECEA
Departamento de Control del Espacio Aéreo (DECEA)
Avenida General Justo, 160, Castelo
Rio de Janeiro-RJ , Brasil
Tel: +5521 2101 6823 / 969 266084
E-mail: davidmm@decea.gov.br

CHILE

Jaime A. González
Asesor de Navegación Aérea
DGAC
Santiago, Chile
Tel: +562 22439 2174
E-mail: jaime.gonzalezn@dgac.gob.cl

ESTADOS UNIDOS

Raul Chong
International Program Officer for South America and Panama
ATO International
Federal Aviation Administration
Washington D. C., Estados Unidos
Tel: +1 202 2670999
E-mail: raul.chong@faa.gov

Tanino Midori
ATO International, Next Gen Lead
Federal Aviation Administration
Washington D. C., Estados Unidos
Tel: +1 202 267 0992
E-mail: midori.tanino@faa.gov

PANAMÁ

Flor Silvera
Directora de Navegación Aérea
Autoridad Aeronáutica Civil
Panamá, Panamá
Tel: +507 3159846 / 3159801
E-mail: fsilvera@aeronautica.gob.pa

Abdiel Vásquez
Director de Comunicación, Navegación y Vigilancia
Autoridad Aeronáutica Civil
Panamá, Panama
Tel: +571 315 9852
E-mail: abvasquez@aeronautica.gob.pa

Carlos Aparicio Pérez
Inspector ANS/CNS
Autoridad Aeronáutica Civil
Panamá, Panamá
Tel: +571 315 9847
E-mail: caparicio@aeronautica.gob.pa

Gilda Espinosa Pérez
Inspector ANS/ATS
Autoridad Aeronáutica Civil
Panamá, Panamá
Tel: +571 315 9817 / 315 9898
E-mail: gespinosa@aeronautica.gob.pa

Raúl Samaniego
Jefe de Gestión de Calidad / SSP
Autoridad Aeronáutica Civil
Panamá, Panamá
Tel: +571 501 9525 / 501 9526
E-mail: rsamaniego@aeronautica.gob.pa

PARAGUAY

Liz Rocío Portillo Castellanos
Gerente de Normas de Navegación Aérea
Dirección Nacional de Aeronáutica Civil (DINAC)
Asunción, Paraguay
Tel: +595 21 205365
E-mail: lizro.portillo@gmail.com

Sindulfo Ibarrola
Gerente de Tránsito Aéreo
Dirección Nacional de Aeronáutica Civil (DINAC)
Asunción, Paraguay
Tel: +595 21 645598
E-mail: sind.ibarrola@gmail.com

Erica Méndez
Jefe de Sección Normas y Reglamentos
Dirección Nacional de Aeronáutica Civil (DINAC)
Asunción, Paraguay
Tel: +595 21 205365
E-mail: erikmendez@gmail.com

Jhonny L. Colman Caballero
Jefe de Seccíon ILS
Dirección Nacional de Aeronáutica Civil (DINAC)
Asunción, Paraguay
Tel: +595 9816 90993
E-mail: jhonnylcc@gmail.com

PERÚ

Sady Orlando Beaumont Valdez
Inspector de Navegación Aérea
Dirección General de Aeronáutica Civil (DGAC)
Ministerio de Transportes y Comunicaciones
Lima, Perú
Tel: +51 1 615-7880
E-mail: sbeaumont@mtc.gob.pe

Luis Luna Calderón
Inspector de Navegación Aérea
Dirección General de Aeronáutica Civil (DGAC)
Ministerio de Transportes y Comunicaciones
Lima, Perú
Tel: +51 1 615-7880
E-mail: llunac@mtc.gob.pe

Víctor Arturo Martínez Serna
Gerente de Seguridad Opericional
CORPAC
Lima, Perú
Tel: +51 1 630-2901
E-mail: amartinez@corpac.gob.pe

Antonino Marquez Rondón
Gerente Técnico
CORPAC
Lima, Perú
Tel: +51 1 444 1176
E-mail: amarquez@corpac.gob.pe

VENEZUELA

Johanna María Morales Herrera
Controlador de Tránsito Aéreo
Instituto Nacional de Aviación Civil
Caracas, Venezuela
Tel: + 5814 2693982
E-mail: johanna.morales@inac.gov.ve

ATECH

Edson Fagundes Gomes
Director ATM Business
ATECH
Rua do Rocio 313 - 10° Andar
04552-000 Sao Paulo, Brasil
Tel: +5511 99195 6225
E-mail: egomes@atech.com.br

IATA

Julio de Souza Pereira
Assistant Director, Safety Flight Operations
IATA
Av. Ibirapuera, 2.332, cj22, Torre I
Sao Paulo, Brasil
Tel: +51 11 2187-4236 / 993800953
E-mail: pereiraj@iata.org

THALES

Frédéric Cuq
Gerente de Desarollo de Negocios
América Latina & el Caribe
3, Avenue Charles Lindbergh
94628 Rungis- France
Tel: +33 6 0786 3101
E-mail: frederic.cuq@thalesgroup.com

OACI

Saulo Da Silva
Chief, Global Interoperable System
Montreal, Canadá
Tel: + 1514 954 8219 Ext.
E-mail: sdasilva@icao.int

Olga de Frutos
Associate Technical Officer ANB/SAF/PCI
Montreal, Canadá
Tel: + 1514 954 8219 Ext. 6021
E-mail: odefrutos@icao.int

Onofrio Smarrelli
Oficial Regional CNS
Oficina Regional Sudamericana
Lima, Perú
Tel: +51 1 611 8686
E-mail: osmarrelli@icao.int

Verónica Chávez
Oficial de Asistencia Técnica
Oficina Regional Sudamericana
Lima, Perú
Tel: +51 1 611 8686
E-mail: vchavez@icao.int

Jorge Armoa
Oficial Regional AIM/MET
Oficina Regional Sudamericana
Lima, Perú
Tel: +51 1 611 8686
E-mail: jarmoa@icao.int

Fabio Salvatierra
Oficial Regional AGA
Oficina Regional Sudamericana
Lima, Perú
Tel: +51 1 611 8686
E-mail: fsalvatierra@icao.int

Fernando Hermoza Hübner
Oficial Regional ATM/SAR
Oficina Regional Sudamericana
Lima, Perú
Tel: +51 1 611-8686, Ext. 106
E-mail: fhermoza@icao.int

Roberto Sosa España
Oficial Regional ANS/SFTY
Oficina Regional Sudamericana
Lima, Perú
Tel: +51 1 611 8686, Ext. 104
E-mail: rsosa@icao.int