



International Civil Aviation Organization

NACC and SAM Regional Offices

NAM/CAR/SAM AIR TRAFFIC SERVICES (ATS) DATA LINK IMPLEMENTATION WORKSHOP

(Philisburg, Sint Maarten, 18-21 April 2016)

Summary of Discussions

NAM/ CAR/ SAM ATS DATA LINK IMPLEMENTATION WORKSHOP

SUMMARY OF DISCUSSIONS

- Date:** 18 to 21 April 2016
- Venue:** Philipsburg, Sint Maarten
- Participants:** The workshop was attended by 47 representatives of 15 NAM/CAR/SAM States, 4 International Organisations and 3 industry representatives. The list of participants appears in the **Attachment** to this document.

1. Introduction

- 1.1 The workshop was conducted by ICAO and had the following objectives:
- a) provide participating States and Air Navigation Services Providers (ANSPs) the necessary technical knowledge and guidance to effectively implement air-ground and ground-ground ATS data link
 - b) present a networking and knowledge-sharing opportunity through which participants exchange best practices and lessons learned
 - c) support the implementation of adopted Aviation System Block Upgrade (ASBU) B0 modules
 - d) provide opportunities to make recommendations in support of regional implementation of the above-mentioned ASBU modules for Implementation groups and the CAR/SAM Planning and Implementation Regional Group (GREPECAS)

1.2 This event supported the implementation of ASBU B0 modules, mainly: B025/FICE - Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration; and B040/TBO – Improved Safety and Efficiency through the initial application of En-Route Data Link. All presentations are posted on the following website <http://www.icao.int/NACC/Documents/Meetings/2016/ATS>

1.3 Mr. Julio Siu, Deputy Regional Director of the ICAO NACC Regional Office welcomed the participants. He highlighted the importance of the event in supporting the implementation of air ground and ground ground Aeronautical Telecommunication Network (ATN) applications, and invited participants to take advantage of the expertise in the workshop with the experts of the Operational Data Link Working Group (OPDLWG) of ICAO and States. Mr. Larry Donker, Deputy Manager Director of Sint Maarten Princess Juliana International Airport (PJIA), together with the Sint Maarten Civil Aviation Authority, informed on the achievements by PJIA and their current works on data links and officially opened the workshop. Mr. Julio Siu and Mr. Onofrio Smarrelli, Communications, Navigation and Surveillance (CNS) Regional Officer of the ICAO SAM Regional Office, acted as Secretaries of the event.

2. Conduction of the Workshop

2.1 The workshop was conducted in 6 sessions, as proposed during the introduction.

SESSION 1 - UNDERSTANDING DATA LINK PLANNING AND IMPLEMENTATION STATUS/INTRODUCTION TO WORKSHOP

2.2 ICAO presented an introduction to the workshop (P/1 - Understanding Data Link Planning and Implementation Status) and informed the results of the survey made to understand the needs and expectations of the workshop and the status of implementation of the data link applications. Finally, ICAO provided the current status of implementation of Controller-Pilot Data Link Communication - Automatic Dependent Surveillance – contract (CPDLC/ADS-C); Air Traffic Services Inter-facility Data Communication (AIDC); and Aeronautical Message Handling System (AMHS) in the NAM, CAR and SAM Regions.

SESSION 2 - INTRODUCTION TO AIR-GROUND DATA LINK / GLOBAL AND REGIONAL PLANS/ ICAO PROVISIONS

2.3 Under P/02, ICAO informed of the valid provisions for data link implementation for planning, implementation and monitoring of the services, including the latest amendments to the ICAO Standards and Recommended Practices (SARPs) and guidance material; and the focus on performance-based approach and ASBU methodology aspects for the ATS data link applications.

2.4 With P/03 – Regional Air-Ground Data Link consideration on planning and implementation on the Digital regional air navigation plan (e-ANP), NAM/CAR/SAM Regional Performance-Based Air Navigation Implementation Plans and GREPECAS; and implementation status of CPDLC/ADS C in the NAM/CAR/SAM Regions were presented by ICAO.

SESSION 3 - PREPARATION FOR AIR-GROUND DATA LINK IMPLEMENTATION (ANSP)

2.5 Under P/04 – *Nav Canada Data Link Implementation*, Canada provided an overview of Nav Canada organization and of their data link services in domestic and oceanic airspace as well as air traffic control towers, describing how data link progressed to its current level in Canada and the importance of planning. The development of the NAM/CAR/SAM Concept of Operations (CONOPS) was stressed. The presentation reminded participants to use the Global Operational Data Link Document (GOLD) to guide any implementation.

2.6 Under P/05 – *Preparation for Air-to Ground Data Link*, United States commented on the importance of CPDLC from the ANSP perspective, explaining their CPDLC application in the oceanic and domestic airspace with the available operational platform (Oceans 21/ATOP system).

2.7 Under P/06 - *Preparing for Data Link Implementation*, the European implementation Perspective was informed, covering the introduction of CPDLC in continental Europe. It described the Link 2000+ programme (scope, strategy and governance), as well as the follow-up actions being performed by the European Commission and the EUROCONTROL Central Reporting Office.

2.8 Under P/07 - *Controller-pilot data link communications (CPDLC) and automatic dependent surveillance – contract (ADS C)* United States provided an overview of the amendments to ICAO Annex 10, Volume II, and Doc 4444 - *Procedures for air navigation services - Air Traffic Management (PANS-ATM)* to align the operational part of the CPDLC/ADS-C provision with current implementation using Future air navigation systems (FANS) 1/A and Aeronautical Telecommunication Network Baseline 1 (ATN B1), and to create a framework for the “next generation” data link provision, referred to as Baseline 2 (B2). It then reviewed supporting guidelines contained in the GOLD, which ICAO is transforming into the Global Operational Data Link (GOLD) Manual (Doc 10037) and the Performance-Based Communications and Surveillance (PBCS) Manual (Doc 9869). The presentation focused on GOLD Manual content from the operator’s perspective and what operators need to do to prepare to use CPDLC/ADS-C. It covered guidelines for establishing policies and procedures, filing flight plans, training and qualification programs, and maintaining CPDLC/ADS-C systems. It stressed the importance of operator participation in regional/State monitoring agencies.

2.9 Under P/08 - *Performance-based communication and surveillance (PBCS)*, United States provided an overview of the amendments to ICAO Annex 6 (all parts), Annex 11, Annex 15, PANS-ATM (Doc 4444) and PANS-ABC (Doc 8400) to include the PBCS provision, which is applicable to communication and surveillance that are required for certain Air Traffic Management (ATM) operations, such as applying performance-based separation minima. Air traffic is increasing and there is a need to optimize the use of available airspace. By taking advantage of emerging technologies, such as CPDLC / ADS-C and satellite voice (SATVOICE), separation minima are being reduced and this will help to optimize the use of available airspace. This progression calls for a need to quantify the enhancements to communication and surveillance performance, with sufficient guidance to optimize costs for developing and maintaining commercially available services, without which it is doubtful that the required performance would be achieved and maintained. The PBCS provision satisfies this need. As a shared responsibility, the presentation reviewed the guidance from ANSP and operator perspectives specifically for CPDLC/ADS-C implementation, contained in the PBCS Manual (Doc 9869). This material is based on the one contained in the inter-regional GOLD, Appendices B, C and D.

SESSION 4 AIR-GROUND DATA LINK IMPLEMENTATION ISSUES, CHALLENGES, LESSONS LEARNED

2.10 Under P/09 – *Challenges and Lessons Learned* Canada highlighted the importance of sharing experiences and reaching out to any and all contacts that one have. It spoke of challenges encountered and lessons learned, and of the importance of understanding that not everything will be perfect and that patience is required. It is important to start slow and to focus as much energy as possible on training and educating the users (controllers and pilots) when and where possible.

2.11 With P/10 - *Air ground data link implementation issues and lessons learned - European experience stemming from Link 2000+ Programme*, EUROCONTROL described the issues arising during the deployment of the LINK 2000+ Programme and lessons learned from this experience, as well as the next steps being planned by the European Commission. There was some discussion about the different needs/approaches to regulation. For the implementation of CPDLC over the ATN a mandate was required in order to stimulate the development of the systems to support it, whereas for the North Atlantic (NAT) FANS mandate the majority of aircraft were already equipped before the mandate was developed.

2.12 Under P/11 - *Data Link Implementation - Lessons Learned - An ANSP Perspective*, United States described some of the challenges that will be faced by ANSPs when implementing data link and the systems associated with its use based considering the experience of the FAA on deploying ADS-C/ CPDLC .

2.13 Under P/12 - *A view of CPDLC from a pilot's perspective*, IFALPA presented its position and good practices for successfully implementing CPDLC/ADS-C.

2.14 Under P/13 - *Air-ground data link deployment – A/C manufacturer perspective*, Airbus presented the aircraft manufacturer perspective with regards to ATS data link services deployment. The introduction of the worldwide context provided an overview on the ongoing initiatives and mandates in the different ICAO regions, based on the two existing ATS data link capabilities, i.e. FANS 1/A and ATN B1. Airbus informed on the fact that FANS 1/A and ATN B1, under deployment in different regions, are not interoperable, which created the need for aircraft manufacturers to provide a dual capability to airlines flying both technologies on long-haul flights, pushing a significant increase of complexity onboard the aircraft.

2.15 Under P/14 - *SITA Data Link*, Information about SITA activities on data link as aircraft cockpit service, implementation of ICAO Very High Frequency (VHF) digital/data link (VDL), ATS data link, VHF Data Link Network Partnerships with ANSPs and Caribbean Region and air traffic control data link opportunities was presented

2.16 Similarly under P/15 – *ARINC Data Link*, ARINC informed of its data link media, Aircraft Communication Addressing and Reporting System (ACARS) coverage, global link High Frequency Data Link (HFDDL), global link ATS services as Aeronautical Fixed Network (AFN), CPDLC, ADS-C, CADS/CFRS, Pre-Departure Clearance (PDC), Departure Clearance (DCL) and Data Link Automatic terminal information service (D-ATIS) services.

STATE EXPERIENCE

2.17 Under P/16, Argentina described its implementation on: ATM Automation Center Ezeiza and Cordoba (2005), Mendoza (April 2016) and Resistencia and Comodoro (May 2016), AIDC/ADS C in Comodoro and Ezeiza ACC, ADS-B CPDLC, AIDC, AMHS and IP national network and described the functionality of automation system.

2.18 Under P17- *Brazil Data Link*, Brazil provided information regarding the Brazilian data link planning consideration (SIRIUS programme), the VHF data link implementation (51 Station), the concession of operation and maintenance of VDL, pre FANS implementation (DCL, D-ATIS and Data Link Meteorological Information for Aircraft in Flight (DVOLMET)) and CPDL/ADS C on Atlantic ACC.

2.19 Under P/18 – *COCESNA ADS-C/CPDLC Implementation*, COCESNA commented the current status of implementation of their ADS-C/CPDLC and the problems to make operation this service.

2.20 P/19 - *Haiti Data Link Planning and Expectations* was a exposure of Haiti's effort and commitment to modernize its air navigation service as planning to implement AMHS and surveillance system.

2.21 Under P/20 – *Air Ground Data Link in South Atlantic Region*, the use and service performance of FANS 1/A, and the potential problem identified in the South Atlantic region were presented.

2.22 In P/21 - *Data Link Operations Piarco FIR*, Trinidad and Tobago presented the CPDLC/ADS C and AIDC processes of implementation, challenges encountered and expectations. AMHS tests with the FAA were informed.

SESSION 5 - INTRODUCTION TO GROUND-GROUND DATA LINK/ GLOBAL AND REGIONAL PLANS/ ICAO PROVISIONS

2.23 Under P/22 - *Regional Ground-Ground Data-Link Implementation*, regional air-ground data link consideration on planning and implementation on the eANP, regional plan based on performance in the NAM, CAR and SAM and in GREPECAS, and implementation status of CPDLC/ADS C in the NAM CAR SAM Regions were presented.

SESSION 6 - GROUND-GROUND DATA LINK IMPLEMENTATION ISSUES

STATE AIDC IMPLEMENTATION EXPERIENCE

2.24 Under P/23 Jamaica explained its ATS challenges (A-G radio and surveillance coverage, coordination, human resource and training), solution of deficiencies (radar sharing, AIDC, CPDLC) and its implementation plan to cover the challenges and deficiencies were presented.

2.25 With P/24 Colombia described the implementation of the automation system in the Bogota and Barranquilla Area Control Centre (ACC) and four Approach Control Offices (APPs) and the implementation and pre operational use of AIDC between the ACC of Bogota with Lima, Guayaquil and Panama ACCs.

2.26 Under P/25 – *Cuba AIDC Implementation Progress*, Cuba presented the progress on the AIDC implementation with the adjacent ACCs (Miami, Merida, CENAMER, Kingston) and the lesson learned in the AIDC implementation. This presentation showed the importance and benefits of AIDC use in the FIR Habana, taking into account the air traffic increase. The implementation status of adjacent FIRs was showed, and the steps taken for the implementation with CENAMER were described as an example. Lessons learned from acquired experiences and recommendations were given.

2.27 Under P/26 – *Dominican Republic AIDC Implementation Progress*, Dominican Republic informed on its AIDC implementation in order to improve verbal coordination. Finally it was informed that its first AIDC interface will be with Miami/San Juan, through the AMHS link. The AIDC Task Force was formed during the First NAM/CAR Air Navigation Implementation Working Group Meeting (ANI/WG/1) in 2014. It is one of the many task forces of this working group, and has the responsibility of streamlining the implementation of AIDC in all FIRs in the region, as well as reporting the progress to the working group. The task force has held several teleconferences and meetings, and has developed an implementation checklist, example Letters of Agreement (LOAs) as reference for adding AIDC agreements to operational LOAs, as well as the AIDC regional plan and evaluation of interface implementations, among other activities and deliverables. The Task Force also has an Ad hoc group for guiding the mitigation of flight plan errors, which has done three phases of data collection to analyse the situation of flight plan errors. These analysis have permitted to reduce significantly the occurrence of duplicate flight plans in the region. The Task Force has met the goal of 50% of FIRs with applicable interfaces implemented (86%), and has established a goal of 9 interfaces in the CAR Region by December 2016.

2.28 Under P/27 COCESNA informed of its 3 phases implementation of the AIDC service between the adjacent FIRS but also within the Central American FIR APPs with the use of the NAM and AIDC Interface Control Documents (ICDs).

2.29 Under P/28 – *AIDC Experience in Peru*, Peru informed of their AIDC implementation process, including the implementation status of AIDC operation with all the adjacent ACCs, the AIDC performance, the problems encountered for the operation of AIDC and the challenges to be solved. Special emphasis was done about the importance of the operational test phase, where all the ATC personnel must be involved in order to troubleshoot any technical and operational issues, and contribute with ATC familiarization and confidence in the system before AIDC final implementation. Emphasis was also done about the role of the flight plan quality and integrity in AIDC performance.

2.30 Under P/29 - *Ground - Ground Data Link – AIDC*, Canada informed on the reason why to use AIDC, the AIDC messages used, the lessons learned and implementation consideration for AIDC. This presentation provided an overview of the AIDC operations in Gander Oceanic. It discussed the advantages of AIDC, the current implementation and lessons learned from the recent expansion to a larger message set. It also emphasized the importance of coordination with adjacent units in the early stages of development.

AMHS INTERCONNECTION

2.31 Under P/30 – *United States AMHS interconnection and Automation System*, United States informed on the status of implementation of AIDC with adjacent ACCs in the NAM. North Atlantic (NAT) and Asia and Pacific (APAC) Regions, comparison between Aeronautical Fixed Telecommunication Network (AFTN) and AMHS, current situation of international AMHS/AFTN and project deployment of AMHS.

2.32 Under P/31 – *United States AMHS Implementation and MET XML Testing*, the workshop was informed on the AMHS implementation process conducted by United States, including the Meteorological Extensible Markup Language (MET XML) tests with AMHS (Hong Kong, United Kingdom, United States and Singapore).

3. CONCLUSIONS/ RECOMMENDATIONS

3.1 Based on the presentations and discussion, the participants agreed on the following conclusions and recommendations:

Air-Ground Data Link Implementation

- a) ATS data link is a fundamental enabler for realizing the concept of future operations (FF-ICE, TBO and SWIM).
- b) There are a number of ICAO Annexes, PANS and Manual concerning ATS Data Link (Service/Message and Media) and they are evolving: Mature ICAO documents and SARPS for air ground data link addressed for messages, services and media are ready as the PANS ATM (Doc 4444 Chapter 4,5 and 14), the GOLD manual (Doc 10037 Edition 1); Doc 9880 - Manual on Detailed Technical Specifications for the Aeronautical Telecommunication Network (ATN) using ISO/OSI Standards and Protocols, Doc 9896 - *Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols*, Doc 9776 - *Manual on VHF Digital Link (VDL) Mode 2*, Doc 9925 - *Manual on Aeronautical Mobile (Route) Service*, Doc 10044 - *Manual on Aeronautical Mobile Airport Communications System (AeroMACS) (to be published in 2016) Annex 10 Volume II and III*,

Doc 9869 - Manual on Required Communication Performance (RCP).

c) Data link provides the following benefits:

- Safety improvements by reducing reception of erroneous message
- Reduction of congestion of voice communications
- Reduction of radiotelephony work load for the pilot and controller
- More availability of voice communications
- Reduction of delayed transfer of communications
- Reduction of retransmissions generated by misunderstood communications
- Less stress for the controller
- Reduction on the required time for controller communication

Planning and installation

- d) The establishment of an ATM operational concept in a State is the starting point for data link implementation. The States are not isolated and in the seamless airspace concept, regional and global initiatives (in that order) must be considered. The NAM/CAR (RPBANIP) and SAM (SAM PBIP) Performance-based regional Plans and the Global Air Navigation Plan (GANP) (Doc 9750) should be taken into account from the beginning.
- e) To ensure global standardization, it is important that development is done using recommendations in the ICAO Doc 10037 (GOLD) (guidelines for service provision, aircraft preparation, controller procedures, flight crew procedures and State aircraft procedures) to ensure any particular needs are considered, documented and shared with all stakeholders and to make sure implementations comply to the applicable standards and guidance materials (avoid misinterpretations).
- f) The institutions related to air traffic management (CAA, ANSP) should develop an evolutionary strategy aimed at providing benefits to the ATM community, through an orderly, safe, and cost-efficient implementation. It should be noted that the evolutionary implementation of the concept is related to the installed capacity on board aircraft.
- g) ICAO CPDLC/ADS-C “operational” can be supported by either FANS 1/A and ATN B1 but they are not interoperable. However, the GOLD Manual provides guidance to prepare for and establish the policies and procedures to use either technology within a global standardization operational framework. Operators always stress the importance of global harmonization of CPDLC/ADS-C procedures and the GOLD Manual is the best resource to facilitate achieving this goal.
- h) Other challenges that need to be considered for an effective implementation of CPDLC/ADS-C are the correction and accurate filing of the flight plan information, delays in messages (FPL, RCL, AFN) and the appropriate CPDLC/ADS-C performance monitoring (active evaluation of problems and timely recommend solutions).

- i) Take the time to carefully plan any data link implementation and only implement those services for which there is an operational need and where the service will meet safety objections.
- j) Continued participation at the regional and international level adds to the pool of experience and knowledge. It is important to share the learnings and solutions discovered, to lend support to other States wherever possible and seek guidance from the different groups when required.

Monitoring

- k) Per Annex 6, operators will need to establish policies and procedures to support PBCS monitoring programme for CPDLC and ADS-C operations.
- l) PBCS is essential to ensure ATC systems, operator systems, communication service provider systems and aircraft systems together will provide reliable CPDLC and ADS-C service suitable for advanced ATM operations. ANSPs should plan for PBCS implementation at the same time when the plan for CPDLC and ADS-C implementation. States will need to establish PBCS policies for its operators even if they are not implementing CPDLC, ADS-C or PBCS in their airspace.
- m) CPDLC and ADS-C systems are very complex for use by pilots and controllers to ensure smooth operations, these systems require to be supported by monitoring agencies that investigate reported problems. These monitoring agencies function under the PBCS monitoring programme provision contained Annex 11.

Training

- n) It is important to invest time and effort into training before implementation and anticipate interoperability tests campaigns with aircraft systems (setup large scale trials with multiple partner airlines for pre-operational validation of the data link services when possible and participate to in-service monitoring agencies).

Support COCESNA CPDLC AIDC implementation

- o) It was noted that CPDLC and ADS-C service in the Central American FIR is on trials since 2014 where the percentage of aircraft equipped is still low. IATA and FAA expressed their support to COCESNA to seek ways of promoting this service with improve safety/business cases and an equipped-best served principle.

Ground-Ground Data Link Implementation

- p) Data link implementations must be involved the participation of all involved stakeholders (users, regulator, ANSPs, CSP, etc.) and supported by a business case and/or a positive operational assessment. An implementation by phased is recommended to ensure the transition of new technology and procedures less problematic and leaves room for adaptation focused in the operational improvements.
- q) For air navigation implementation, all CAR/SAM States should follow the Global Air Navigation Plan (GANP), its technological roadmaps, the ICAO ASBU methodology, CAR/SAM regional plans, and align their implementation activities by developing their respective national air navigation plans.

- r) The staff in charge of the data link air-ground and ground-ground system planning should have at their disposal all ICAO documents and Annexes published on the topic.

AIDC

- s) In order to optimize AIDC implementation, States should consider taking action to mitigate/resolve filed flight plan (FPL) issues. It was recommended that regional efforts be consolidated in order to coordinate mitigation actions between the CAR and SAM Regions. This aspect includes the total update of FPL converters
- t) Close cooperation is required among States in order to achieve the interconnection of automated systems, for instance, the agreement of the ICD to apply, amendment to operational agreement letter, and definition of common aspects to be implemented.
- u) AIDC implementation has shown its advantages in terms of safety and efficiency:
- ✓ significantly reduces the need for oral coordination between ATS units
 - ✓ reduces controller workload
 - ✓ reduces repetition/readback errors during coordination
 - ✓ reduces coordination errors and "controller-to-controller" language barrier issues
 - ✓ mitigates Large Height Deviations (LHDs), thus avoiding mid-air collisions
- greater support to performance-based navigation initiatives and emerging technologies through automation

- v) It was recognized the importance of evaluating each operational scenario involving AIDC implementation and management of desirable messages, and subsequently assessing its impact on controller workload and its end results in order to select the most appropriate AIDC ICD for implementation.
- w) The preferred ICD for the CAR and NAM Regions is the NAM ICD, and the PAN ICD for the SAM Region.
- x) AIDC implementation represents the initial phase towards ground-ground integration and Flight And Flow - Information for a Collaborative Environment (FF/ICE) implementation (FPLs exchange, coordination and radar handover).
- y) The non-compliance with the AIDC procedures established by ICAO to manage flight plans and associated messages brings increased flow of unnecessary messages in system operation.

AMHS

- z) Eventhough AMHS implementation had a good implementation rate in the SAM Region, just a few States in CAR Region are actually operational.
- aa) The experience on the use of MET data using the XML format as described by United States was noted and it was recommended to use these experiences for the CAR/SAM testing and assessment of XML using the AMHS system.

LIST OF PARTICIPANTS / LISTA DE PARTICIPANTES

Name / Position Nombre / Puesto	Administration / Organization Administración / Organización	Telephone / E-mail Teléfono / Correo-e
Argentina		
Alfredo Fabián Iacono Jefe de Departamento de Comunicaciones	Dirección General de Control de Tránsito Aéreo - Argentina	Tel. +54911 5789 8400 E-mail fabianiacono64@gmail.com
Antonio E. González Jefe de Conmutación de Datos	Dirección General de Control de Tránsito Aéreo - Argentina	Tel. +54911 4480 2376 E-mail aegonzalez82@gmail.com
Marcos Darío Molina Auxiliar Tesorería	Dirección General de Control de Tránsito Aéreo - Argentina	Tel. +54911 57898400 E-mail direconfin@yahoo.com.ar
Guillermo Luis Castro Inspector CNS	Administración Nacional de Aviación Civil - Argentina	Tel. +011 5941 3181 E-mail gcastro@anac.gob.ar
Walter Omar Castro Encargado Dirección de Servicios de Navegación	Dirección General de Control de Tránsito Aéreo - Argentina	Tel. +54911 5789 8400 E-mail castroatm@yahoo.com.ar
Diego F. Agüero Inspector/Auditor	Administración Nacional de Aviación Civil - Argentina	Tel. +5411 5941 3000ext69196 E-mail daguero@anac.gob.ar
Aruba		
Joselito M. Correia de Andrade Air Navigation Services Aruba N.V.	Department of Civil Aviation	Tel. +1 297 5282700 E-mail joselito.correideandrade@ansa.aw
Canada / Canadá		
Shelley Balley ATS International Coordination	NAV Canada	Tel. +1-709-651-5240 E-mail bailesh@navcanada.ca
Colombia		
Cristian Amaris de Leon Técnico Aeronáutico VI	UAEAC	Tel. +571 296 2272 E-mail cristian.deleon@aerocivil.gov.co
Cuba		
Carmen De Armas Pérez Especialista de Aeronavegación	Instituto de Aeronáutica Civil de Cuba	Tel. + 537 838 1121 E-mail carmen.dearmas@iacc.avianet.cu
Luis Manuel Ruiz Godoy Supervisor Técnico Operacional CACSA	Corporación de la Aviación Cubana, S.A.	Tel. +237 271 1257 E-mail luis.godoy@cacsa.avianet.cu
Grenada / Granada		
Dennis John Philibert ATC Supervisor	Grenada Airport Authority	Tel. +473 444 4114/444 4101 E-mail Dennis.philbert@hotmail.com

Name / Position Nombre / Puesto	Administration / Organization Administración / Organización	Telephone / E-mail Teléfono / Correo-e
Haiti / Haití		
Rudy Jean-Marie Mahault Dit Electronic Engineer	Office National de l'Aviation Civile (OFNAC)	Tel. +509 2822 1123/3886-3281 E-mail mahaultrudy@gmail.com
Nadia Leopold Ingenieure CNS	Office National de l'Aviation Civile (OFNAC)	Tel. +509 377 11287 E-mail nleopold@hotmail.com
Jamaica		
Terence Wilson Air Traffic Controller	Jamaica Civil Aviation Authority	Tel. +876 960 3948 E-mail terence.wilson@jcaa.gov.jm
Derrick Grant CNS Engineer	Jamaica Civil Aviation Authority	Tel. +876-960-3948 E-mail derrick.grant@jcaa.gov.jm
Orville Shaw Special Projects Officer	Jamaica Civil Aviation Authority	Tel. +1 876 960-3948 E-mail orville.shaw@jcaa.gov.jm / villanova4@hotmail.com
Charles Wright Radar Specialist	Jamaica Civil Aviation Authority	Tel. +876 960 3948 E-mail charles.wright@jcaa.gov.jm
Fabian Taylor Assistant CNS Engineer	Jamaica Civil Aviation Authority	Tel. +1 876-960-3948 E-mail fabian.taylor@jcaa.gov.jm
Gavin Gayle Technician	Aeronautical Telecommunications Limited (AEROTEL)	Tel. + 876 952 0238 E-mail gavinggayle@yahoo.com
Carl Fearon Senior Technician	AEROTEL/Jamaica Civil Aviation	Tel. +876 960 3965/978 4037 E-mail cfearon@aerotel-jm.com
Nicoli Gabbidon Quality Assurance Officer	Jamaica Civil Aviation Authority	Tel. +876 960 3948 E-mail nicoli.gabbidon@jcaa.gov.jm
Panama / Panamá		
Edwin Ayala Técnico/Supervisor del Depto. De Comunicaciones	AAC Panamá	Tel. +315 9877/9805 E-mail eayala@aeronautica.gob.pa
Peru / Perú		
Jorge Eduardo Merino Rodríguez Air Traffic Controller	CORPAC S.A.	Tel. +511 414 1000 E-mail jmerino@corpac.gob.pe
Dominican Republic / República Dominicana		
Luis Emilio Fuentes Fuente Controlador de Tránsito Aéreo	Instituto Dominicano de Aviación Civil	Tel. +809 274 4322 ext2035 E-mail luis.fuentes@idac.gov.do
Fernando A. Cassó Rodríguez Radar Systems Manager	Instituto Dominicano de Aviación Civil	Tel. +1 809 274 4322 ext2084 E-mail fernando.casso@idac.gov.do

Name / Position Nombre / Puesto	Administration / Organization Administración / Organización	Telephone / E-mail Teléfono / Correo-e
Sint Maarten		
Craig Romney Electronics Engineer	Princess Juliana International Airport	Tel. +721 546 7533/581 4766 E-mail cromney@sxmairport.com
Christian President Electronics Engineer	Princess Juliana International Airport	Tel. +721 546 7531 E-mail cpresident@sxmairport.com
Lloyd Hinds Director Air Traffic Services	Princess Juliana International Airport	Tel. +7215207489 E-mail lhinds@sxmairport.com
Trinidad and Tobago / Trinidad y Tabago		
Kent Ramnarace-Singh Unit Chief Planning and Technical Evaluation	Trinidad and Tobago Civil Aviation Authority	Tel. +1 868 668 8222 Ext 2532 E-mail krsingh@caa.gov.tt
Andrew Ramkissoon Communication Navigation Surveillance Engineer	Trinidad and Tobago Civil Aviation Authority	Tel. +868 669 4806 E-mail aramkissoon@caa.gov.tt
United States / Estados Unidos		
Scott Conde NATCA Air Traffic Controller	Federal Aviation Administration (FAA)	Tel. +1-510-673-0237 E-mail sconde@natca.net
Tom Kraft Chief Scientific and Technical Advisor (CSTA) of Aeronautical Communications	Federal Aviation Administration (FAA)	Tel. +202 369 2168/ E-mail Tom.kraft@faa.gov
Dulce M. Rosés Program Manager, International Telecommunications CAR/SAM	Federal Aviation Administration (FAA)	Tel. +1 305 716 1830 E-mail dulce.roses@faa.gov
Naomi Ruschack ATO Contractor	Federal Aviation Administration (FAA)	Tel. +609 485 4870 E-mail naomi.ctr.ruschak@faa.gov
Nigel Simmons Sr. Principal Engineer (SEMCON Group)	Federal Aviation Administration (FAA)	Tel. +301 760 7648 E-mail nigel.ctr.simmons@faa.gov
Uruguay		
Daniel Ripoll		Tel. E-mail
Airbus		
Jérôme Condis Multi Program Business and Operations	Airbus	Tel. +33561188968 E-mail jerome.condis@airbus.com

Name / Position Nombre / Puesto	Administration / Organization Administración / Organización	Telephone / E-mail Teléfono / Correo-e
COCESNA		
Jenny Lee Instructora de Tránsito Aéreo	COCESNA	Tel. +504 2283 4750 E-mail jenny.lee@cocesna.org
EUROCONTROL		
David Isaac Central Reporting Office Coordinator	Eurocontrol	Tel. +32 27294738 E-mail David.isaac@eurocontrol.int
IATA		
Kieran O'Carroll Assistant Director, Safety and Flight Operations, Americas	International Air Transport Association	Tel. +786 536 3493 E-mail ocarrollk@iata.org
IFALPA		
Robert Torn Air Traffic Services Committee Chair	IFALPA	Tel. +514 954 5065 E-mail atschair@ifalpa.org
Rockwell Collins - ARINC		
Manuel Gongora Director Aviation Services	Rockwell Collins ARINC	Tel. + 786 266 1703 E-mail mgongora@arinc.com
Ángel López Lucas ExDirector Comercial Latin America ARINC		Tel. +954 430 2775 E-mail angellopezlucas@comcast.net
SITA		
Philip Clinch Vice President Aeronautical Services	SITA	Tel. +1 (770) 303 3767 E-mail Philip.clinch@sitaonair.aero
ICAO / OACI		
Julio Siu Deputy Regional Director	ICAO NACC Regional Office	Tel. + 52 55 5250 3211 E-mail jsiu@icao.int
Onofrio Smarelli CNS Regional Officer	ICAO SAM Regional Office	Tel. +511 611 8686 E-mail osmarelli@icao.int