



ICAO

International Civil Aviation Organization  
North American, Central American and Caribbean Office

DISCUSSION PAPER

NACC/WG/5 — DP/06REV  
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**Fifth North American, Central American and Caribbean Working Group Meeting (NACC/WG/5)**  
Port of Spain, Trinidad and Tobago, 22-26 May 2017

**Agenda Item 3**

**Implementation on Air Navigation Matters**

**3.3 ANI/WG Progress on AIM, ATM and CNS**

**PBN IMPLEMENTATION TASKFORCE PROGRESS REPORT**

(Presented by the PBN TF Rapporteur)

<b>EXECUTIVE SUMMARY</b>	
<p>This discussion paper presents the updated progress report of the PBN Taskforce taking into consideration deliberations of the PBN Taskforce during NACC/WG/5.</p>	
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"><li>• Safety</li><li>• Air Navigation Capacity and Efficiency</li><li>• Security &amp; Facilitation</li><li>• Economic Development of Air Transport</li><li>• Environmental Protection</li></ul>
<i>References:</i>	<ul style="list-style-type: none"><li>• NAMCAR Regional Performance-Based Air Navigation Implementation Plan (RPBANIP)</li><li>• Minutes of PBN TF teleconferences</li><li>• Final report of ICAO/IATA/CANSO Performance-Based Navigation (PBN) Harmonization, Modernization and Implementation Meeting for the Caribbean (CAR) Region 28 March – 1 April 2016, Fort Lauderdale, Florida, United States</li><li>• Final report of Third NAM/CAR Air Navigation Implementation Working Group Meeting (ANI/WG/3) ICAO NACC Regional Office, Mexico City, Mexico, 4 to 6 April 2016</li><li>• Progress Report by PBN Task Force WP/08 ANI/WG3</li><li>• Final report of Regional and National Air Navigation Performance Framework/Aviation System Block Upgrade (ASBU) Implementation Workshop for the NAM/CAR Regions (Mexico City, Mexico, 22 – 26 August 2016)</li><li>• Final report of Second ICAO/IATA/CANSO Performance-Based Navigation (PBN) Harmonization, Modernization and Implementation Meeting for the Caribbean (CAR) Region San Jose, Costa Rica, 7–9 December 2016</li></ul>

## 1. Introduction

1.1 During the NACC/WG/5 Meeting, the PBN taskforce (TF) met as a Working Group Committee and discussed the following working papers/information papers:

WP/02, WP/03, WP/09, WP/13, IP/02

1.2 The PBN TF also engaged in discussion relating to issues such as:

- PBN Taskforce Terms of reference (TORs)
- PBN Taskforce Points of Contact (POCs)
- PBN Taskforce action plan
- Progress and activities accomplished from ANI/WG/03 to date
- Training needs
- Assistance required from ICAO

1.3 The Working Group Committee consisted of representatives from Antigua and Barbuda, Barbados, Cuba, Mexico, Saint Lucia, Saint Vincent and the Grenadines, United States, Trinidad and Tobago, COCESNA, ECCAA, IATA and ICAO. A telephone call was also made to the CANSO Latin American and Caribbean Regional Director to discuss CANSO's continued involvement in the PBN Task fForce activities.

## 2. PBN TF Progress and results

2.1 For ASBU Training, the ICAO NACC Office held the Regional and National Air Navigation Performance Framework/Aviation System Block Upgrade (ASBU) Implementation Workshop for the NAM/CAR Regions (Mexico City, Mexico, 22 - 26 August 2016). The workshop was attended by 40 representatives of 15 NAM/CAR States/Territories, and 4 International Organizations.

2.2 Successful RNAV 5 live trials held within PIARCO's Continental en-route airspace in July 2016, with the participation of major airline operators (e.g. AAL, ACA, DAL, TAM and UAL). Results from the trials showed savings in fuel, time and increased operational efficiency.

2.3 There were two PBN task force teleconferences held in June 2016. Items discussed were the new PBN route proposals and the submission in the ICAO format. Routes had to be finalized by June 30th 2016 for ICAO's approval.

2.4 In preparation for the Second PBN Harmonization, Modernization and Implementation Meeting held in San Jose, Costa Rica, from 6- 9 December 2016, a series of monthly teleconferences was also held to discuss progress post ICAO/IATA/CANSO Performance-Based Navigation (PBN) Harmonization, Modernization and Implementation Meeting for the Caribbean (CAR) as well as other matters.

2.5 There were four teleconferences held in total to discuss these matters.

Items discussed:

- Review and open items from previous meetings/teleconferences.
- Updates on Modernization/Harmonization Activities – Group Rapporteurs
- Updates on Implementation Activity
- New route proposals as PfA1 to be presented at the Costa Rica meeting. This PfA will be included in ICAO DOC 7030 - Regional Supplementary Procedures and DOC 8733- Air Navigation Plan- Caribbean and South American Regions.

2.6 There was an ATS Routes review teleconference on 23 November 2016 for final review of routes before admission to PfA1

2.7 The Second PBN Harmonization, Modernization and Implementation Meeting updated information for the Proposal for Amendment (PfA) development to Doc 8733 – Air Navigation Plan – Caribbean and South American Regions.

2.8 The Meeting discussed relevant actions on the Proposal for Amendment implementation as follows:

- Route proposals were reviewed one by one, allowing the interaction among stakeholders in order to concur in modifications, changes and agreements
- United States noted that the PBN ATS Routes within its FIRs may be used by aircraft below FL180 and that for regulatory reasons, it does not use the Upper or Lower designator prefixes to differentiate
- Dominican Republic did not reflect Venezuela and Curacao requirements
- Colombia agreement is required on waypoints in the Maiquetia and Curacao FIRs
- Jamaica expressed concern for not concluding their proposal
- ICAO will assist States with the assignment of 5LNC with ICARD system usage

2.9 As agreed at the first PBN meeting in Ft. Lauderdale, Florida, all participating States agreed, to the extent applicable, to reduce longitudinal separation from 80 NM to 40 NM between transferred air traffic operating in the Flight Information Regions (FIRs) of the CAR Region. Some States, in some areas, further agreed to reduce separation to 20 NM between transferred air traffic operating in the CAR Region FIRs.

2.10 LoAs for the coordination and operational procedures between the air traffic control facilities continue to be negotiated and signed. As discussions have now included FIRs of States in the ICAO South America (SAM) Region, States and Air Navigation Service Providers (ANSPs) have agreed to further review and introduce applicable longitudinal separation minima of 40 NM or 20 NM between transferred air traffic operating in the FIRs of the CAR region and adjacent FIRs of the SAM Region.

- There were review proposals of new PBN Routes, Implementation and trials in the FIRs of the CAR Region and Coordination with Adjacent Regions During these discussions, States and Air Navigation Service Providers (ANSPs) of the CAR and SAM Regions agreed to further review Air Traffic Service (ATS) new Routes, in order to introduce all the new requirements of the air traffic operating in the FIRs of the CAR Region and adjacent FIRs of the SAM Region, in

this regard the Meeting agreed on the following: CAR States submit routes which have been agreed by the respective adjacent FIRs to ICAO for a Second Proposal for Amendment (PfA2) not later than 27 February 2017.

- The Federal Aviation Administration (FAA) will submit proposed Area Navigation (RNAV) routes from the METROPLEX and “Y” projects to harmonize regional ATS route network.

2.11 In order to have better coordination and harmonization within the sub-regions, the ANI/WG PBN Taskforce selected Regional champions as follows:

- Mr. Robert Rooplal – Trinidad and Tobago- (ECAR)
- Mr. Alexi Batista – Dominican Republic -Eastern (C/CAR)
- Mr. Courtney Malcolm – Jamaica- Western -(C/CAR)  
Mr. Christopher Chambers (former)
- Mr. César Turcios Valiente-Costa Rica—(Central America)

2.12 It was concluded the need for intersessional work. It was agreed that monthly teleconferences with the Regional champions be held to discuss the following:

- Review of Completed Proposal for Amendment (PfA)
- Submission/Briefings of New Proposals
- Presentation by States
- Review of Progress on Longitudinal Separation
- Break-out sessions by Regions facilitated by Champions
- Briefings by IATA on Operational Matters

2.13 During this meeting, Cuba, Curaçao, Dominican Republic, and Trinidad and Tobago presented new ATS routes to be proposed for the second Proposal for Amendment, to be coordinated with adjacent FIRs through their Regional champions.

2.14 Monthly teleconferences were held on the following dates to discuss as follows:

- 9 February 2017: Development of the Second Proposal for Amendment (PfA2) and report on the event logistics for the Third (3<sup>rd</sup>) PBN meeting in Florida, United States from 8 to 12 May 2017.
- 17 March 2017 (For Champions): To report on Proposals for Amendment (PfA1 and PfA2).
- 17 March 2017: To report on Proposals for Amendment (PfA1 and PfA2).
- 28 March 2017: To update on Proposals for Amendment (PfA1 and PfA2).

2.15 An ICAO PBN Go Team Mission was conducted from March 13 – 15, 2017 in Jamaica. The team performed a gap analysis on the Jamaica PBN Implementation Plan and has since submitted recommendations aimed at accelerating their progress.

2.16 Regarding PfA2, champions were notified by ICAO NACC that there are still some unresolved coordination problems, delayed by lack of response of some states. ICAO NACC determined that 31 March 2017 as the new deadline for this submission (PfA2).

2.17 On 31 March 2017 ICAO NACC advised that the Third (3<sup>rd</sup>) Meeting (Florida, United States, 8-12 May 2017) will be postponed, due to venue conflicts.

2.18 There will be a teleconference on 21 April 2017 to provide follow-up in this matter and PfAs status.

### **3. Discussion**

3.1 The WG discussed the importance of the PBN GO-TEAM Missions. All agreed that the missions were beneficial to those that have already received them and that all States/Territories/Organizations, that have not already done so, should seek to take advantage of this initiative.

3.2 The WG discussed the quantification of fuel savings by airline operators based on PBN implementation. IATA advised that actual fuel savings can only be quantified after the first phase of upper airspace PBN route restructuring takes place.

3.3 It was agreed that in order to obtain the current status of effective PBN implementation within the region, a new PBN survey should be conducted with all States/Territories/Organizations by the end of September 2017. The ICAO NACC ATM RO advised that he will conduct this survey as part of his familiarization with POC's from each State/Territory /Organization.

3.4 Training needs identified by the WG to assist with PBN implementation are as follows:

- Instrument Flight Procedure Design
- Airspace Design
- ATCO PBN Training
- Pilot Training
- Airline Flight Dispatcher Training

3.5 Although the upper airspace PBN route re-design has already begun, it was reported that attention was required in the Lower Airspace/Terminal Airspace (TMA's). The connectivity between the upper airspace and lower airspace designs require specific collaborative workshops between relative ANSPs and stakeholders. It is imperative that decision makers recognize the need for suitably qualified/trained representation at these meetings. Additionally, there is a requirement for personnel with decision making capabilities. COCESNA advised that they have started a programme with the States in the lower airspace to ensure harmonization of the lower and upper airspace design. The ECAR advised that a workshop was held in Trinidad and Tobago in November 2015 during which an initial concept was designed, however, a meeting amongst all TMA's, Trinidad and Tobago, Puerto Rico and Sint Marten is required.

3.6 Lack of resources continues to be a major impediment to effective PBN implementation. The WG discussed that the following elements were necessary in order for PBN implementation objectives to be met:

- Human Resource – Staffing availability/Organizational Structure aimed at ensuring the availability of suitably trained and qualified subject matter expertise.
- Financial Resources - training, attendance to meetings/workshops, hardware/software to aid in airspace and procedure design or outsourcing of PBN procedures and airspace design.

3.7 The WG identified the need for operational meetings with airline operators in order to engage in CDM regarding the Airspace Concept. This discussion should also centre on the understanding the Airspace Organization and Management initiatives were being developed to ensure average operational benefit to all stakeholders.

3.8 In November 2014, ICAO included amendment 6 to the document 8168 Vol 2 which incorporated new criteria for BARO VNAV procedures. Due to this, procedures that were developed prior to this amendment should be reviewed to ensure compliance.

3.9 Reviews of the Work Programme, Terms of Reference and Points of Contact were conducted and are attached as **Appendix A, B and C** respectively.

#### **4. PBN Taskforce Recommendations**

4.1 States/Territories/Organizations need to continue engaging in the CDM process with all stakeholders when re-designing their airspace.

4.2 States/Territories should continue to provide data to ICAO NACC RO and the PBN Taskforce on developments in their airspace.

4.3 States/Territories/Organizations should continue to participate in the regional project to harmonize the upper level airspace routing structure among the NAM/CAR/SAM Regions.

4.4 States/Territories/Organizations should take advantage of the PBN Go Team Missions provided by the ICAO NACC Office.

4.5 States/Territories/Organizations should ensure that suitably trained/qualified personnel should attend workshops/meetings relating to airspace design.

4.6 States/Territories/Organizations should ensure that regular meetings are held with airline operators and other stakeholders in order to ensure the effectiveness of PBN implementation initiatives.

4.6 PBN Taskforce TELCONS to be held during the first week of every month.

**5. Draft Conclusions****DRAFT CONCLUSION****NACC/WG/5/XX****EFFECTIVENESS OF PBN AIRSPACE HARMONIZATION MEETINGS**

That, in order to improve the effectiveness of the PBN Airspace harmonization workshops/meetings/telcons NAM/CAR States/Territories/Organizations should:

- a) ensure that suitably trained/qualified personnel should attend workshops/meetings relating to airspace design.
- b) ensure that human and financial resources are provided to ensure that PBN implementation objectives are achieved.

**DRAFT CONCLUSION****NACC/WG/5/XX****ANALYSIS OF CURRENT PBN IMPLEMENTATION STATUS IN THE NAM/CAR REGION AND MEASUREMENT OF ITS EFFECTIVENESS**

That, in order to determine the current state of PBN implementation in the NAM/CAR Region, determine the roadblocks to implementation and identify ineffective initiatives utilized on past PBN projects;

PBN Task Force:

- a) develops and submit a PBN survey form to the ICAO NACC ATM RO by June 30 2017;

ICAO NACC Office:

- b) conducts surveys with NAM/CAR States/Territories/ Organizations by September 30 2017; and
- c) provides results of survey to PBN Taskforce by October 2017.

**DRAFT CONCLUSION****NACC/WG/5/XX****CDM WITH STAKEHOLDERS**

That, in order to improve the effectiveness of the PBN Airspace implementation, NAM/CAR States/Territories/Organizations should engage in regular CDM meetings with the airline operators and other stakeholders.

**DRAFT CONCLUSION**

**NACC/WG/5/XX**

**FEASIBILITY STUDY ON THE ESTABLISHMENT OF A FLIGHT PROCEDURE PROGRAMME (FPP) WITHIN THE NAM/CAR REGION**

Taking into consideration ICAO Assembly Resolution A39 – 14, where States are urged to utilize FPPs for PBN implementation, the PBN Task Force in collaboration with the ICAO NACC Regional Office should:

- a) conduct a survey which identifies which States/Territories/International Organizations require assistance in procedure design;
- b) identify the resources required for the establishment of a FPP within the Region; and
- c) provide a report to the ANI/WG/4 (2018), with appropriate recommendations.

**6. Suggested Actions**

6.1 The Meeting is invited to:

- a) take note of the deliberations of the PBN Taskforce during the NACC/WG/5;
- b) accept the draft conclusions of the PBN Taskforce; and
- c) propose any other action or task as deemed necessary.

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## APPENDIX A

**ACTION PLAN FOR PBN IMPLEMENTATION  
REVISION MAY/MAYO 2017**

Task Name/ Tarea	Start/ Inicio	Finish / Final	Deliverables/ Resultados	Follow-up/ Seguimiento	Responsible/ Responsables	Observations/ Comments- Observaciones/ Comentarios
a) Implement PBN Airspace Redesign Project for oceanic, continental and terminal areas in of NAM/CAR/SAM Region in accordance with the ICAO PBN Manual Doc 9613 and Doc 9992	APR 2015	JUN 2019	i) Update the regional PBN <b>Upper Airspace</b> concept with implementation activities for the period 2015-2019	ICAO/IATA/CANSO PBN Harmonization Meetings & Airline Operators	PBN Taskforce, ICAO, CANSO, IATA, States, Territories, Organizations, Airline Operators	States/Organizations to develop a PBN Airspace Redesign Project including: a revision of regional ATS Route network.  <b>Resources required:</b> Airspace Designers, ATCOs, Airline Operators, ANSP Decision makers
	APR 2015	DEC 2018	ii) Update the regional PBN <b>Lower Airspace</b> concept with implementation activities for the period 2015-2018	PBN Harmonization Meetings between FIR ANSP and TMAs ANSPs & Airline Operators	PBN Taskforce, ICAO, IATA, CANSO, States, Territories, Organizations, Airline Operators	States/Organizations to develop a PBN Airspace Redesign Project including: a revision of regional ATS Route network.  Resources required: Airspace Designers, ATCOs, Airline Operators, ANSP Decision makers
b) Develop and implement PBN training programme for pilots, ATCOs, operators and regulators	APR 2015	DEC 2018	PBN training programme	ICAO PBN Manual includes guidelines to develop training programmes	States, Territories, Int. orgs, Operators and ANSPs	PBN TF to engage with Civil Aviation Training Centers to develop PBN training programmes for pilots and controllers
c) Implement CDOs/CCOs for SID/STARS in terminal areas based on RNAV 1-2 and RNP 1-/2 navigation specification, as required	APR 2015	DEC 2018	Implement CDOs/CCOs in TMAs	States continue implementation of CDOs and CCOs	PBN TF, States, Territories, Int. Org	
d) Evaluate current state of PBN implementation within the region	JUN 2017	SEP 2017	Current status relating to PBN implementation in the region	Ongoing	PBN TF ICAO, States, Territories, Int. Orgs	
e) Conduct a feasibility study on the establishment of a Flight Procedure Programme within the Region	AUG 2017	MAY 2018	A comprehensive study looking into the need for an FPP within the Region based on States' needs as well as identifying the resources that would be required		PBN TF, ICAO, States, Territories, International Organizations, IATA, CANSO.	PBN TF to: <ul style="list-style-type: none"> <li>• Conduct research into FPP's already established,</li> <li>• Analyse Region's needs for such an entity</li> <li>• Produce a document with</li> </ul>

Task Name/ Tarea	Start/ Inicio	Finish / Final	Deliverables/ Resultados	Follow-up/ Seguimiento	Responsible/ Responsables	Observations/ Comments- Observaciones/ Comentarios
			and the possible benefits.			recommendations to the ANI/WG.
f) Efficient application of longitudinal separation across the NAM/CAR/SAM regions.	APR 2014	DEC 2018	Analysis of applicable separation minima for transfer traffic between FIRs	ANSPs of States, Territories, Int. Orgs to update existing Letters of Agreement (LOAs) between ATC units	ANSPs of States, Territories, Int. Orgs	PBN TF to support ANSPs in reduction from 80 NM to 40NM by DEC 2016 and to 20NM by DEC 2017 Some FIRs were using as low as 5NM in their own airspace, based on existing procedures and LOAs.
g) Develop post-implementation PBN Safety Assessment Programme	2010	DEC 2019	States to conduct post-implementation PBN Safety Assessment	Permanent On going activity conducted by States	States, Territories, Int. Organisations	On going
h) Monitor implementation progress	2008	DEC 2019	Annual review of PBN implementation	On-going activity conducted by ICAO	ICAO, States, Territories, Int. Organisations	On going

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## APPENDIX B

### TASK FORCE ON IMPLEMENTATION OF PERFORMANCE-BASED NAVIGATION (PBN) AIRSPACE CONCEPT

#### 1. *Background*

1.1 During the first ANI/WG meeting, a PBN Implementation Task Force was formed in order to streamline related air navigation implementation activities. This Task Force shall carry out specific studies to support Performance-Based Navigation (PBN) implementation in the NAM/CAR Regions in accordance with the NAM/CAR RPBANIP, as well as update and report progress to the ANI/WG based on the action plan for these tasks.

#### 2. *Responsibilities*

The Task Force is responsible for:

- a) Work Programme Management
- b) Continued refinement and ongoing review of the NAMCAR PBN Implementation Plan and monitoring and reporting on its application in the Regions
- c) Assisting States with optimizing the Air Traffic Services (ATS) route structure within the NAM/CAR Regions based on PBN Airspace Concept implementation
- d) Carrying out specific studies, developing guidance material and organizing workshops and seminars to assist States with Area Navigation/Required Navigation Performance (RNAV/RNP) implementation in the en-route, terminal, and approach flight phases, taking into account the PBN concept according to the ICAO Strategic Objectives and Global Plan Initiatives (GPIs)
- e) Assisting States with preparation and review of their PBN Implementation Plan to ensure regional harmonization and possible inclusion in ICAO regional documentation
- f) Identifying deficiencies and constraints with PBN implementation, and propose solutions that would facilitate resolution of such problems
- g) Addressing other regional PBN implementation issues, including those related to safety management
- h) Reviewing activities of PBN Task Forces from other regions, including their PBN implementation action plans, to ensure harmonization and avoid duplication of work

#### 3. *Working Methods*

The Task Force will:

- a) Present its work programme containing activities in terms of objectives, responsibilities, deliverables and timelines
- b) Avoid duplicating work within the ANI/WG and maintain close coordination among the existing entities to optimize use of available resources and experience
- c) Designate, as necessary, ad hoc groups to work on specific topics and activities and organize clearly defined tasks and activities
- d) Coordinate tasks to maximize efficiency and reduce costs via electronic means including emails, telephone and teleconference calls, and convene meetings as necessary
- e) Report on and coordinate the progress of assigned tasks to the ANI/WG

4. **Work Programme** - will be included
5. **Membership:** Provided in Appendix C.

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## APPENDIX C

## POINTS OF CONTACT

STATE/ORGANIZATION/TERRITORY/FIR	PBN (POC)NAME	EMAIL
<b>Antigua &amp; Barbuda</b>	Shenneth Phillips	shenneth.phillips@ab.gov.ag
<b>Barbados</b>	Kendrick Mason	kendrick.mason@barbados.gov.bb
<b>Costa Rica</b>	Edwin Jimenez Barrantes	cr_edwinjimenez@hotmail.com
<b>Cuba</b>	Jorge Centella Artola	jorge.centella@iacc.avianet.cu
<b>Curacao</b>	Jacques Lasten	j.Lasten@dc-ansp.org
<b>ECCAA</b>	Anthony Meade	ameade@eccaa.aero
<b>Guatemala</b>	Enio Hernandez	eniowr@gmail.com
<b>Haiti</b>	Eric Legagneur	elegagneur@hotmail.com
<b>Honduras</b>	Heriberto Sierra Pavon	hsierra@ahac.gob.hn
<b>Jamaica</b>	Courtney Malcolm	courtney.malcolm@jcaa.gov.jm
<b>Mexico</b>	Jose Gil Jimenez Augusto Gomez Rojas	<a href="mailto:Jigiljim@sct.gob.mx">Jigiljim@sct.gob.mx</a> Augusto.gomez@sct.gob.mx
<b>Nicaragua</b>	Eleana Salguera M.	esalgueram@gmail.com
<b>Republica Dominicana</b>	Alexi Batista	<a href="mailto:alexismbr991@hotmail.com">alexismbr991@hotmail.com</a> alexi.batista@idac.gov.do
<b>Saint Lucia</b>	Errol Cherubin	errol.cherubin@slaspa.com
<b>Saint Vincent &amp; the Grenadines</b>	Lyda Ollivierre	ollivierrelyda@gmail.com
<b>Trinidad and Tobago</b>	Robert Rooplal	rrooplal@caa.gov.tt
<b>United States Focal POC</b>	William Fernandez Bruce Kinsler	<a href="mailto:william.v.fernandez@faa.gov">william.v.fernandez@faa.gov</a> bruce.kinsler@faa.gov
<b>United States – San Juan</b>	Felipe Fraticelli	felipe.fraticelli@faa.gov
<b>United States – Miami</b>	Janice Deak	janice.deak@faa.gov
<b>United States – Houston</b>	Mike McGhee	mike.mcghee@faa.gov
<b>United States – New York</b>	Jim Webb	jim.webb@faa.gov
<b>COCESNA</b>	Cesar Turcios Valiente Pablo Luna Victor Andrade	<a href="mailto:cesar.turcios@cocesna.org">cesar.turcios@cocesna.org</a> <a href="mailto:Pablo.luna@cocesna.org">Pablo.luna@cocesna.org</a> victor.andrade@cocesna.org
<b>IATA</b>	Marco Vidal	vidalm@iata.org
<b>CANSO</b>	Javier Vanegas	javier.vanegas@canso.org

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