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ASSEMBLY — 38TH SESSION

TECHNICAL COMMISSION

Agenda Item 35: Air Navigation — Implementation Support

REPORT ON THE PBN IMPLEMENTATION PROGRESS IN CENTRAL AMERICA

(Presented by COCESNA)

EXECUTIVE SUMMARY	
This working paper shows the most recent progress achieved by Central American Corporation for Air Navigation Services (COCESNA) in Central America in relation to PBN implementation.	
Strategic Objectives:	This working paper relates to the Safety and Environmental Protection and Sustainable Development of Air Transport Strategic Objectives.
Financial implications:	Financial management conducted with funds provided by COCESNA.
References:	RPBANIP, May 2011 version IPBN ACNA, 10 August 2011 version

1. INTRODUCTION

1.1 The Central American Agency for Air Navigation Services (ACNA, by its initials in Spanish) as part of the Central American Corporation for Air Navigation Services (COCESNA, by its initials in Spanish), developed its activities by taking as a reference the May 2011 version of the RPBANIP document approved by the fourth meeting of North American, Central American and Caribbean Directors of Civil Aviation (NACC/DCA/4), as well as the 10 August 2011 version of the PBN implementation plan (IPBN).

[1] English and Spanish versions provided by COCESNA.

(15 pages)

2. FOLLOW-UP TO THE PBN IMPLEMENTATION PROGRESS IN CENTRAL AMERICA

2.1 An overview of the most important ACNA-COCESNA progress with regard to the fulfilment of regional performance objectives (RPO) and action plan duties for the regional PBN implementation is presented below.

RPO 1.- ATS ROUTE STRUCTURE OPTIMISATION IN EN-ROUTE AIRSPACE

COCESNA has supported the implementation of 18 RNAV routes in the upper airspace of the Central American flight information region (FIR). COCESNA is also looking forward to adding an average of 12 more routes in 2013, thus providing efficiency benefits in:

a) reduction of fuel consumption;
b) aircraft capacity to fly as close as possible to the preferred flying routes;
c) increase of airspace capacity; and
d) provision for the use of advanced technologies (e.g. FMS-based arrivals) and tools for decision support in ATC (e.g. separation and sequencing), thus increasing efficiency.

RPO 2. FLEXIBLE USE OF AIRSPACE IMPLEMENTATION (FUA)

a) COCESNA is aware of some ATS agreements between Central American States and military authorities. Some of these agreements have established civil-military coordination committees.

b) There has been coordination with the State of Belize to reduce the (MZP1) prohibited area in the approach path to runway 07 at Phillip S. Goldson International Airport. In addition, it has been suggested to reduce the (MHR5) restricted area in Honduras. A reduction or elimination of prohibited or restricted airspaces affecting mainly some PBN approaches has been considered as well.

RPO 3. IMPROVEMENT OF DEMAND-CAPACITY BALANCING (DCB)

By developing the air traffic flow management (ATFM) implementation project for Central American States and COCESNA, an important progress has been attained in the following activities:

a) project work programme updating;

b) regional coordination through regular teleconferencing in the CAR region, with the participation of COCESNA;

c) creation of an ATFM centre in COCESNA headquarters in Tegucigalpa, Honduras;

d) publication and dissemination of the declared capacity of ATC by sectors of the Area Control Centre of the Central American FIR (CENAMER ACC/FIC);

e) support to the State of Costa Rica in the creation of the ATFM sub-centre;

f) support to the State of Guatemala in the creation of the ATFM sub-centre; and

g) planning to fit out an ATFM sub-centre in COCESNA's Central American Institute for Aeronautical Training (ICCAE) in El Salvador, in the second semester of 2013.

RPO 4 IMPROVE THE SITUATIONAL UNDERSTANDING OF AIR TRAFFIC MANAGEMENT (ATM)

a) development of a modernisation plan for ATM automation systems in Central America;

b) agreement of radar data sharing between COCESNA-Cuba and preparation for the counterpart agreement between COCESNA-Jamaica;

c) continuing automatic dependent surveillance-broadcast (ADS-B) data analysis; and

d) trial plans for 2013 with automatic dependent surveillance-contract (ADS-C) data and controller-pilot data link communications (CPDLC) in the Central American Pacific Oceanic FIR.

In order to support the GREPECAS project C2, COCESNA has contributed to establish coordination with experts from the states on different subjects. Their progress is summarised as follows:

Review of the regional surveillance strategy for the implementation of systems in support of situational awareness improvements

a) In accordance with the unified regional surveillance strategy for the CAR SAM region, specifically for mid-term (2010-2015) en-route and TMA airspace implementations, COCESNA has taken into account the implementation of the new automated system AIRCON2100 in CENAMER, the inclusion of data processing and monitoring functions of data types such as conventional radar modes A and C, Mode S, ADS-B and ADS-C, as well as CPDLC, AIDC and OLDI data interchange.

b) Functions indicated in the above paragraph shall be implemented in February 2014, as the new ATS CENAMER system starts operating. After setting these new implementation dates in COCESNA systems, April 2014 is proposed as a new date to assess the situational awareness improvements to be implemented in automated systems.

Guidelines for improvements in both land and air warnings

a) a survey on the electronic warnings implemented by each state was sent. Surveys by Guatemala, Cuba, upper airspace of C.A. –COCESNA, Saint Martens were received.

b) 18 June 2013 was established as the new deadline for the Central American States that have not returned the survey.

Guide to the guidelines for the operational implementation of ADS-B and data exchange.

a) participation of an assigned expert for the completion of the task was proposed.

b) the ADS ‘C’ implementation document was sent by SITA’s expert. This document has already been sent to each one of the expert members in order get some valuable feedback, concerning the implementation of ADS ‘B’.

Pending area of action:

The FAA will send an achievement report, concerning the ADS 'B' implementation in the USA. This will allow the expert panel to get to know these achievements, with a view to working out an implementation guide proposal.

Orientation guide supporting the implementation of ATFM.

So far, there is no significant progress, given that the person in change has not sent the documentation yet.

Orientation guide for the use of AIDC to reduce coordination errors

a) the coordinator of the activity received the two guides for the use of AIDC, one for the SAM region and the other one for the CAR NAM region; and

b) at the next ICAO's meetings, with Cuba's leadership, the possibility of standardising the guides for CAR NAM and SAM regions will be analysed.

Orientation guide for developing SIGMET in a graphic format

Since May 2013, COCESNA has implemented the graphic alternative to follow up to SIGMETs on its webpage. You can find this graphic aid at: http://apps.cocesna.org/eAIM/servlet/metarview.

RPO 5. IMPLEMENTATION OF ICAO'S NEW MODEL OF FLIGHT PLAN FORM

The project 'Implementation of the New Flight Plan (FPL) Format for COCESNA' met the objective of establishing a strategy to implement the management capacity of the new FPL format, through the aviation messaging system of the Central American FIR. The most important activities included:

- Develop the strategies necessary to carry out the implementation efforts for the new flight plan form on the aviation messaging network;

- Update COCESNA'S AFTN/AMHS Aviation Messaging System Software.

- Provide the operating users in Central America with the training necessary to develop the skills needed to use the software applications developed by COCESNA;

- Create the backups necessary and the contingency plans for the project, covering the different scenarios and taking account of the different technical and operational options.

- Perform the system transition planning, assays, internal and external testing.

- Issue the publications necessary to keep Central American FIR users informed and at the same time, create proper conditions, so that the adjacent FIRs will be able to follow up the recent work to coordinate testing among the different ATC.

a) this RPO has been successfully completed, allowing for a harmonised and coordinated transition to the new ICAO's model format since 15 November 2012, thanks to the work carried out by CA/ANE/WG and other working teams, users, operators and international bodies such as COCESNA, CANSO and IATA.

b) to achieve this, the required improvements to the data processing systems were made by AFTN and the planning for ATC system improvement was performed. In addition, the establishment and revision of bilateral agreements between air navigation service providers (ANSP) of adjacent airspaces and regions, for the testing and interface of the data processing systems of the New ICAO's Model Flight Plan (FPL) Form was carried out; the rules and procedures required to avoid duplicity or mistakes in the presentation of FLP were published. Training programmes were performed as well as a revision of the sufficient number of qualified personnel at ANSPs.

c) with this RPO, efforts have been directed towards the reduction of duplicated, missing or degraded flight plans and the improvement of flight plans as well.

Progress achieved in regional experience concerning the change to the new flight plan format

The implementation of the new FLP in Central America led to changes in two types of aviation systems: 1) the messaging systems y 2) and the Control Centres.

In the case of the messaging systems, COCESNA, as the owner of the developments, performed the updates thereto internally. For automated ATS systems, the renewal of CENAMER systems in Managua, Nicaragua and El Salvador was contracted. For the remainder of the systems, COCESNA installed a 'converter', which is in full operation and allows for compliance with the amendment.

In addition, by means of a regional plan throughout Central America, the related activities of socialisation and training that this change involved were carried out.

RPO 6 IMPROVE THE SEARCH AND RESCUE SYSTEM (SAR)

The coordination of the Search and Rescue System (SAR), provided by COCESNA, within the Central American SRR, is contingent on what has been established by the regional agreements signed by COCESNA and the Member States of the Central American SRR and by the recommended, international rules and procedures, in compliance with Article 25 of the Convention on International Civil Aviation.

The Search and Rescue Unit (SAR) RCC/SPOC along with COCESNA's Information Technology (IT) have been developing an application that will enable the Central American States to keep records directly, by means of SIAR (Regional Aviation Information System), of the emergency equipment in the 406 MHZ frequency, thus making a significant contribution in this regard.

It will allow for precise location of any aircraft or vessel in danger or requiring help.

This function will keep specific records and all the updated details about the aircraft, like photographs and emergency equipment, according to the new COSPAS-SARSAT format.

The application will be installed in the next few months in each one of the Authorities and Directions of Civil Aviation in Central America.

With respect to the analysis of causes of beacon activation, there is coincidence between the SAR coordination and the indications in the manual of specialised SAR organisations, in the sense that the causes of false ELT beacon activations in the 406 MHZ frequency are due to:

- wrong installation inside the aircraft;
- mishandling of equipment by the aircraft maintenance staff;
- malfunction of ETL, PLB, EPIERB;
- voluntary activation;
- other unknown circumstances; and
- environmental conditions.

Simultaneously, the Search and Rescue Coordination Unit is also seeking to implement a software in the next few months of this year, to be called 'RCC/SPOC /SAR TRACKING SYSTEM', whose primary function is to receive the warning messages from different emergency equipment connected to the Central American FIR; locate the aircraft or vessel directly on a Central American FIR map, according to the coordinates indicated by the incoming message; and show the closest radio aids to the location spot. It may also keep an electronic blog, a dashboard or whiteboard for comments by staff members, reports by air traffic controllers, for monthly statistics of occurred events or warnings outside the Central American FIR.

SAR Agreements

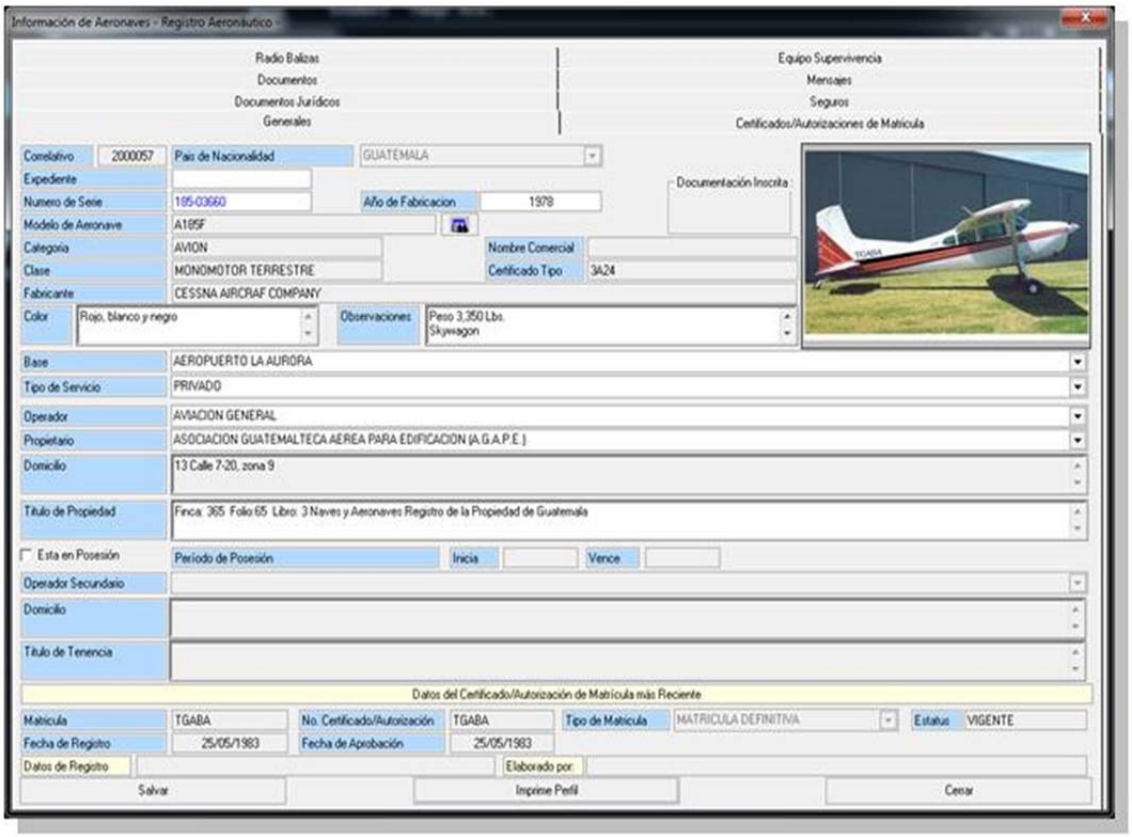
a) the Search and Rescue Committee (COBUSA) is in charge of coordinating SAR implementation activities in Central America;

b) there is an agreement between the Civil Aviation Authorities, and other cooperation agreements between civil and military authorities for the provision of the SAR service in Central America;

c) COCESNA already has letters of agreement or SAR agreements with all the states of the Central American region, with respect to the adjacent states to Central American FIR;

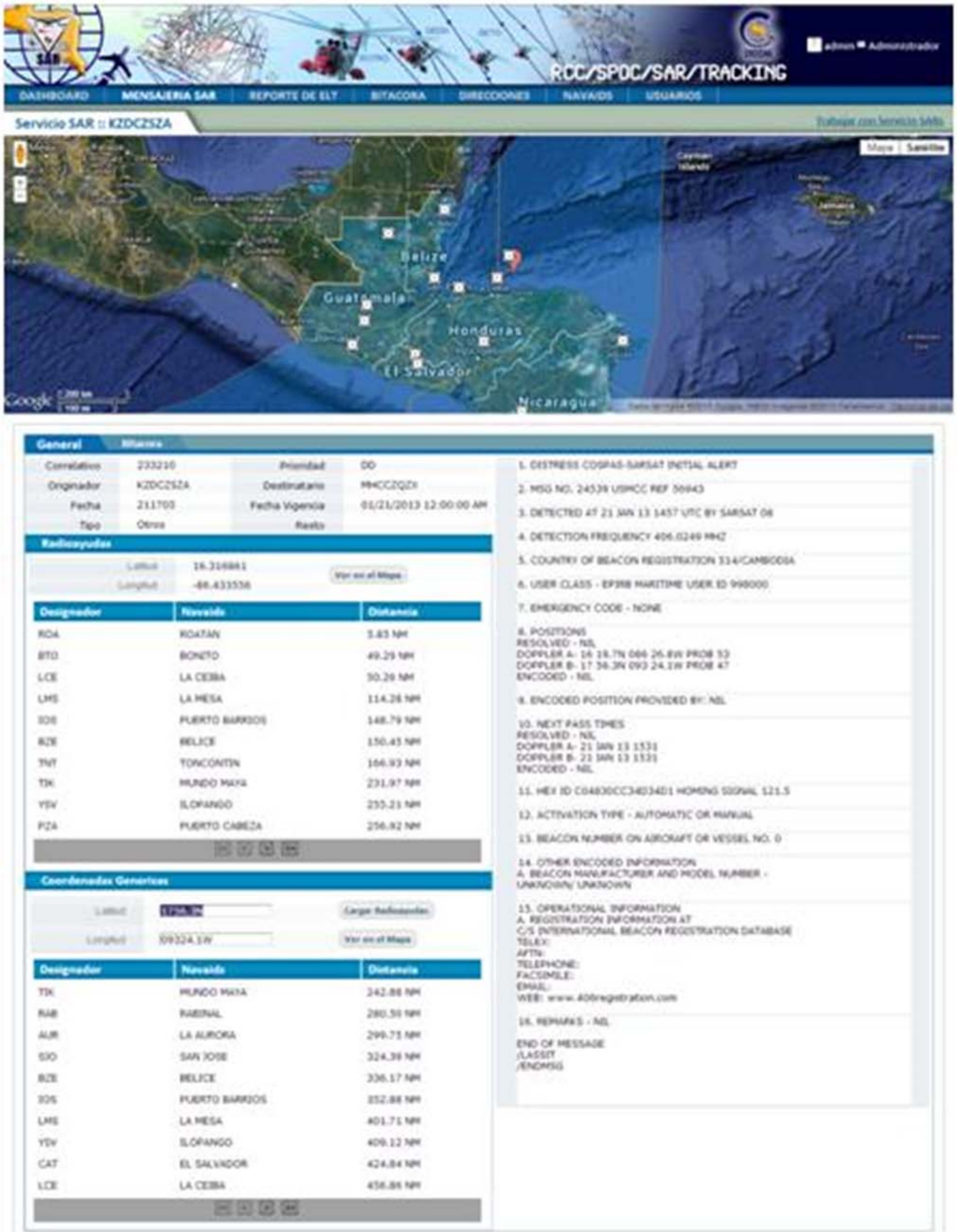
d) it also has SAR agreements with Panamá and Colombia; and

e) efforts are being made to come to similar agreements with Mexico, Cuba and Ecuador.



Screens of the Information System of Aeronautical Regulations (SIAR, by its initials in Spanish) for emergency equipment records on the 406 MHz ELT frequency.

Screen of the 'RCC/SPOC /SAR TRACKING SYSTEM' warning messages system.


RCC/SPOC/SAR/TRACKING
DASHBOARD
MENSAJERIA SAR
REPORTE DE ELT
BITACORA
DIRECCIONES
NAVAIDS
USUARIOS
Servicio SAR :: KZDCZSZA
Belize
Guatemala
Honduras
El Salvador
Nicaragua
Google
General
Radioayudas
Designador
Navaids
Distancia
ROATAN
BONITO
LA CEIBA
LA MESA
PUERTO BARRIOS
BELICE
TONCONTIN
MUNDO MAYA
ILOPANGO
PUERTO CABEZA
Coordenadas Genericas
RABINAL
LA AURORA
SAN JOSE
EL SALVADOR
1. DISTRESS COSPAS-SARSAT INITIAL ALERT
3. DETECTED AT 21 JAN 13 1457 UTC BY SARSAT 08
7. EMERGENCY CODE - NONE
8. POSITIONS
10. NEXT PASS TIMES
12. ACTIVATION TYPE - AUTOMATIC OR MANUAL
14. OTHER ENCODED INFORMATION
15. OPERATIONAL INFORMATION
TELEX:
AFTN:
TELEPHONE:
FACSIMILE:
EMAIL:
16. REMARKS - NIL
END OF MESSAGE
/LASSIT
/ENDMSG

RPO 9 OPTIMISATION AND MODERNISATION OF COMMUNICATIONS INFRAESTRUCTURE

a) ATS voice channel between El Coco APP and the Area Control Centre (ACC) of Panama implemented.
b) ATS voice channel Mérida ACC and Belize APP implemented.
c) Operation of AMHS system in Central America.
d) Improvements to CAMSAT communications network.
e) Agreements for the testing of ADS-C and CPDLC data processing for Central American Pacific Oceanic FIR (Search for solution to a deficiency).
f) Initial testing to improve VHF AMS communications at Kingston FIR, in cooperation with COCESNA.
g) Implementation plans and trials for direct interchange of (OLDi) data in Central America.

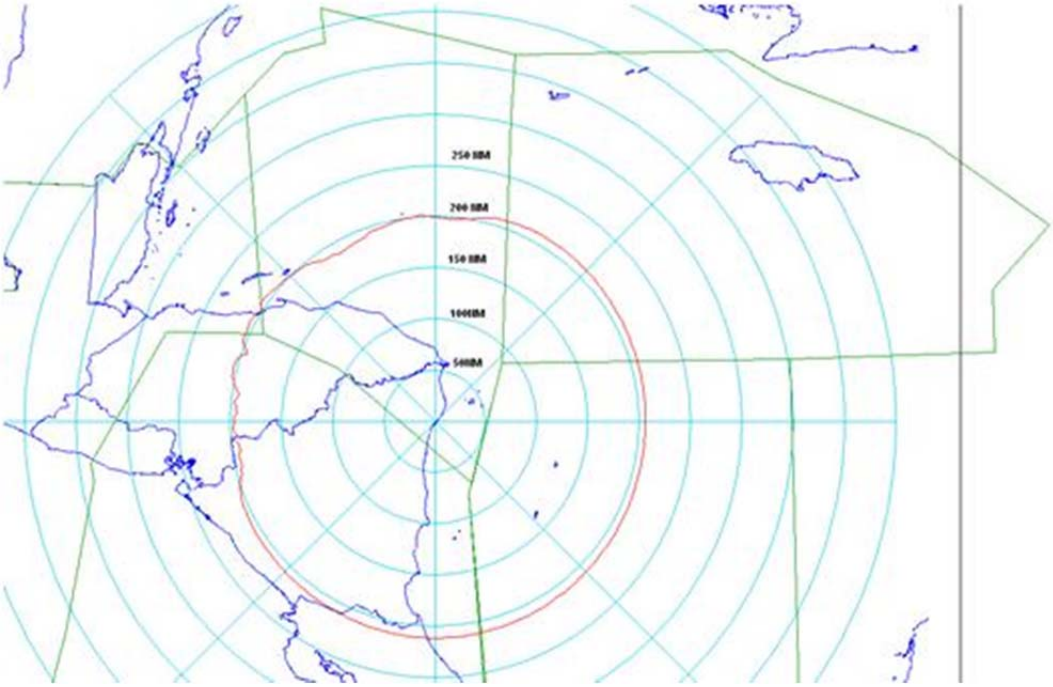
To improve VHF and HF coverage

Panama and Jamaica have requested that COCESNA consider the installation of VHF equipment at the site of Puerto Cabezas (PZA) to correct VHF communication failures at their FIR bordering lines.

Progress has been achieved with Jamaica and contact with MEVA service provider has been made in order to enable and test the existing channel between Tegucigalpa and Kingston. The corresponding configuration and testing are currently being conducted.

In PZA, VHF systems have already been tested and the correct coverage at the sites of interest has been checked.

At the end of the medium installation and testing through MEVA network, the necessary testing will have been performed all the way to the operating systems of Jamaica.

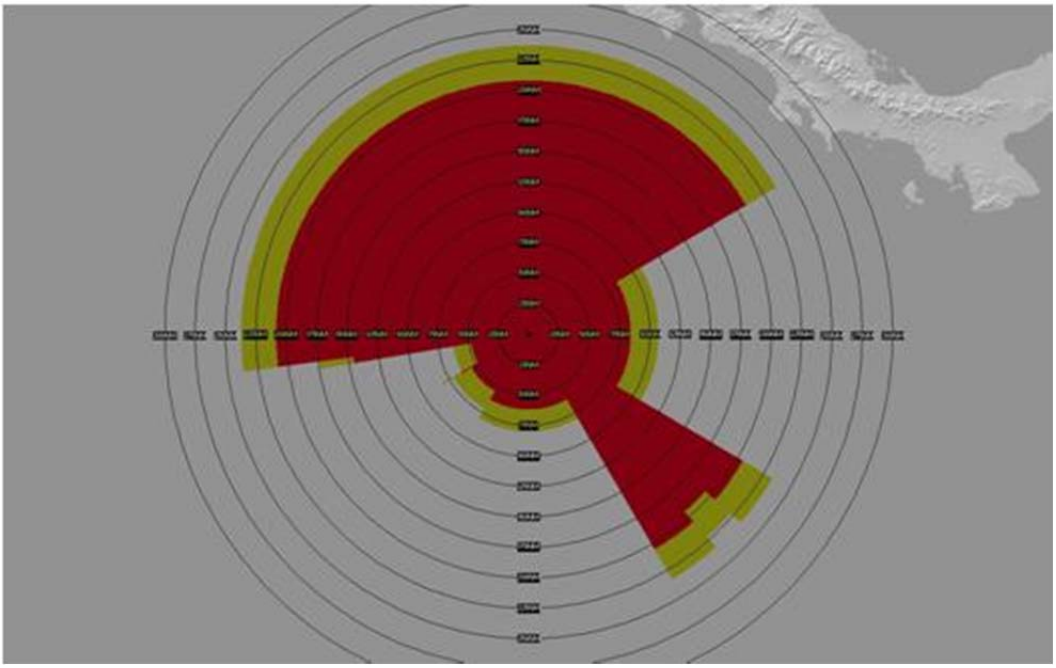


Plans to improve AMS/HF coverage in Pacific Oceanic Area of CA FIR

Facility at El COCO Island

COCESNA and ICE (Costa Rican Institute of Electricity) signed an agreement that allowed COCESNA to build a facility at El COCO Island (on the South Pacific) for (AMS/VHF) communications systems on the 124.1 MHz frequency. For this implementation, a VPN has been contracted from CENAMER to the site, through COCESNA's and ICE's internal network infrastructure. Nowadays, the system is on both quality and coverage trials.

In conclusion, it has been noted that the island site is not the best now from the operational point of view, due to the low elevation of the terrain and the small height of the tower. However, this facility is useful for the coverage of the North-Western sector, as well as the Eastern and Southern parts of the island. For the moment, this facility is working as a backup system for the equipment installed on this frequency (124.1 MHz) at Poas Volcano and Buenavista Hill.



As per ICE, they intend in the near future to develop a project, including the erection of a tower in one of the highest points of the island. This will allow for the overcoming of the current coverage limitations, according to the developed feasibility.

Improvements in HF Systems

COCESNA carried out a study of HF communications in the Pacific Zone, the result of this study was the same diagnosis obtained to improve HF communications in the Central American Oceanic FIR. The installation of a High-Gain Antenna is necessary as well as the seasonal use of HF frequencies. COCESNA contracted the project, which will be developed simultaneously to the modernisation of CENAMER's Control Centre.

The project will include two stages:

The first stage that corresponds to the reception site in San Pedro Sula, equipment and antennas have already been installed and completion is scheduled for 14 June 2013.

Photographs of equipment and antennas which have already been installed are presented as follows:

The second stage corresponds to the transmitter-receiver site at Laguna El Pedregal. This stage requires the acquisition of a new site by COCESNA. The land has already been acquired, and currently the topography work is being contracted. If everything develops as planned, this stage will have been completed by 17 February 2014.

ATS voice circuits:

- ATS voice circuits have been implemented and a new ATS channel between La Aurora Control and Tapachula Mexico is in correct operation. This will improve coordination between the two centres, and the arrival of aircraft coming from Central America with too high an altitude to start an instrument approach with at Tapachula International Airport will be avoided.
- OCO-PAN Circuit: During 5-16 September 2011, COCESNA completed the installation of a VSAT node in their Satellite Telecommunication Network. This installation will enable, among other services, the ATS Panama Control – El Coco channel, by means of an FXS hot line.
- The implementation of Belize Merida communications was agreed at a meeting between MEXICO and COCESNA, held at NACC WG 03. Actions will be taken as follows:

  a) implementation of the technical communication channel by using the existing infrastructure. COMPLETED.

  b) signing up of the relevant Belize – COCESNA – Merida letter of agreement. IN PROGRESS.

Implementation of a digital terrestrial network in Central America to support CAMSAT

Currently, COCESNA is going through the modernisation process of its microwave network. The main characteristics of this new communication network are: It will be a private digital communication network, covering the entire Central American region with a 40 Mbps capacity per radio section. It is based on IP technology. This will allow for a better integration with both current and future services. It uses open-architecture equipment/COTS and state-of-the-art technology. It is flexible and scalable to facilitate changes and network growth. It is a high availability network (with redundancy), with intelligence distributed within the Backbone nodes and with no common failure point. It has traffic prioritisation and centralised management. In 2011, the installation of radio links was completed in the Central American region (except for Guatemala in 2012).

Currently, the implementation of the final stage of the project is under way. This stage consists in the implementation of the access network, for which CONCESA has contracted the BT Company. The equipment has already been installed and services are expected to be in place by July 2013.

The Microwave network will become the main platform for aeronautical voice and data communications in Central America, for the use of COCESNA, Civil Aviation Authorities and Airports.

Implementation of AIDC/OLDI in the Central American FIR

COCESNA and the Central American States have signed a contract with INDRA Company. It is expected that the Control Centres of CENAMER, Managua and El Salvador will be modernised in the first stage. These new systems include the OLDI and AIDC functions. The provider has been requested contractually to do the integrations thereto with these functions between centres, as they are modernised.

Evaluation of radar coverage and identification of improvements to meet operating requirements

A contract for the renewal of the secondary radar at Las Nubes, which sends data to Managua's Control Centre (this equipment is owned by the Civil Aviation Authority of Nicaragua), has been signed. The project is at its implementation stage and it is expected to come into operation by the beginning of the second semester of 2013.

Implementation of radar data sharing

COCESNA-CUBA interchange: Taking account of the support it would give to air traffic management in the corresponding (FIR) Flight Information regions as well as to the Traffic Flow Management (ATFM), and following the strategies prescribed for the region concerning the exchange of radar data, both COCESNA and Cuba have shown interest in making this kind of interchange, through which COCESNA would share with Cuba the SSR radar data located in the Cayman Islands, and in turn, Cuba would share with COCESNA the radar data at San Julian. The agreement has been signed and the interchange of technical information has taken place. Cuba is expected to update its MEVA station, so that the interchange will take place.

In addition, nowadays COCESNA is interchanging radar data with Panama on a trial basis. COCESNA is already providing this country with the radar data of Puerto Cabezas and also provides CENAMER with the radar data at the Enrique Malek Airport in David. Nowadays, the interchange is under assessment by both parties.

ADS-B, ADS C trials:

ADS-B

Nowadays, COCESNA is testing ADS-B with a receiver located at Cerro de Hula, and the presentation system at CENAMER and data collection are intended to be used within the framework of regional studies.

ADS C, CPDLC:

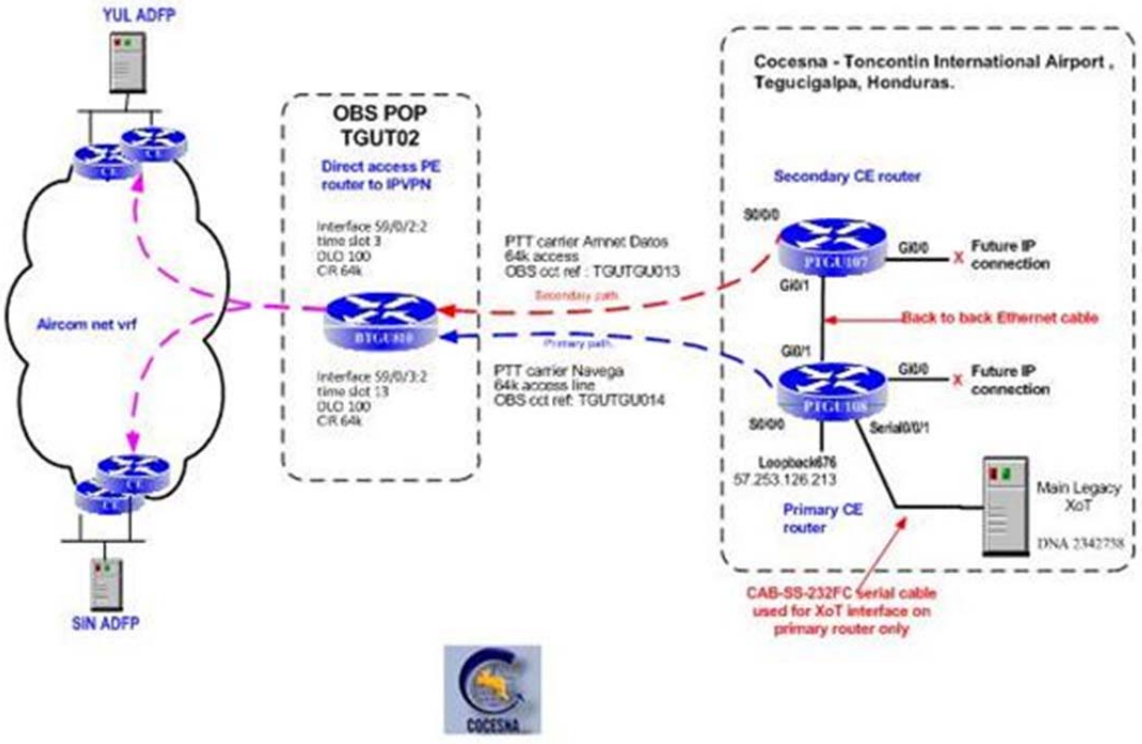
COCESNA carried out an ADS-C and CPDLC information analysis in the South Pacific Zone. Results showed that the systems were indeed available on the market, that they are technically viable to be installed at the Control Centre and that they can provide coverage for the area of interest.

CENAMER Control Centre has ADS/CPDLC Data Link Servers (Data Link Servers – DLS). The system has the capacity to manage ADS/CPDLC communications through connections to the networks of Data Link providers. It allows for the interchange of messages between aircraft and the Data Link Terminal and ADS data distribution to the subsystem of Surveillance Data Processing (SDP) for the monitoring of ADS and ADS/SSR tracks, as well as for the recording of all the messages transmitted.

Routers installed by the service provider

Currently, interconnection problems with the service provider are being solved, so as to enable the FANS Service Provision to the CENAMER Control Centre. The provider has already installed the optical fibre links and the router in the MACC equipment room. This equipment was connected to the servers used for communications and treatment of protocols and data. (See the following interconnection diagram and images).

Optical fibre installation



RPO 10. IMPLEMENTATION OF THE WORLD GEODETIC SYSTEM – 1984 (WGS-84) Y e-TOD

It is known that most of the Central American States have completed their WGS-84 surveying, but there is no information of action plans related to e-TOD.
COCESNA has shown significant progress with the implementation of the Geographic Information System (GIS) and has started the incorporation of the Aeronautical Information Exchange Model (AIXM) for the electronic version of the Aeronautical Information Publication (AIP) of Central America.

AIM/COCESNA has collaborated with the translation into Spanish of the first version of the "Electronic Terrain and Obstacle Data Manual" under the task *"Developments for the supply of electronic terrain and obstacle data (e-TOD) in the States,"* of CAR G1 Project of GREPECAS AIM Programme.

RPO 11. IMPLEMENTATION OF THE TRANSITION TO AERONAUTICAL INFORMATION MANAGEMENT (AIM)

CA/ANE/WG was informed of the implementation of quality systems at the Costa Rican and Nicaraguan AIS. Concerning COCESNA's AIM transition, the following is clear:

a) COCESNA's transition plan to AIM was updated on 8 March 2013;

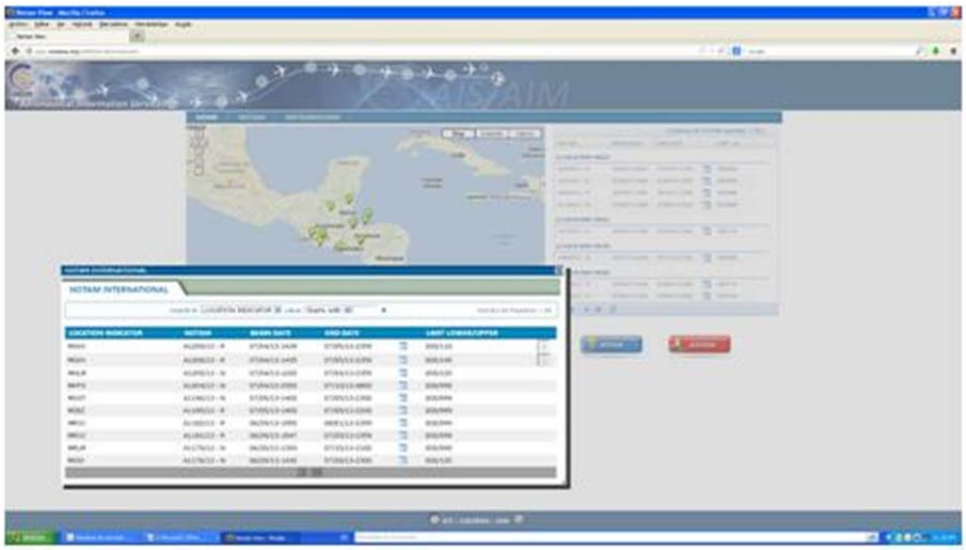
b) ISO 9001-2008 re-certification of the Quality Management System (QMS) of AIM within COCESNA's Integrated Management System (SIGC, by its initials in Spanish).

c) Implementation of a Geographic Information System (GIS) for the production of aviation cartography by AIM/COCESNA, from the Aviation Information Publication of Central America and Honduras.

d) COCESNA has created an electronic version of the Integrated Aeronautical Information Package (IAIP) in Central America with the integration of the Aeronautical Information Exchange Model (AIXM).

RPO 12. IMPROVE THE AVAILABILITY OF METEREOLOGICAL INFORMATION

The collaboration of the Technology Management (GT, by its initials in Spanish) has made available NOTAM and MET information in a format that is more suitable to the AIM transition, from May 2013. http://apps.cocesna.org/eAIM/servlet/notamview



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