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NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN OFFICE

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Agenda Item 3: Specific Air Navigation Activities and Developments
3.5 Air Traffic Management (ATM)

ATS DATA LINK OPERATIONAL APPLICATIONS

(Presented by the Secretariat)

SUMMARY

This paper proposes data link operational applications for aeronautical terminal information service - data link (ATIS-D), data link service of pre-departure clearance (PDC) in air traffic services.

References:

- Report of the Eleventh Air Navigation Conference Montreal (22 September to 3 October 2003)
- Report of the GREPECAS 10 and 11 Meetings
- Report of the Third Regional Air Navigation CAR/SAM Meeting (Buenos Aires, Argentina, 5-15 October 1999)

1. Introduction

1.1 The Eleventh Air Navigation Conference, held in Sep-Oct/2003, analyzed the future development of air-ground communications, and recognized that several technical, operational and economic issues have to be addressed in order to obtain the coexistence of multiples systems through different implementation scenarios, being that the increasing use of aircraft communications addressing and reporting system (ACARS), Mode S, and its benefits are meaningful part of them and pointed out the integrity of information as an essential supporting element for ATM Safety.

1.2 It also points out that the early application of data link communications provides greater benefits to the ATM community for the collaborative decision-making mostly in oceanic/low-density airspace and specific type of operations as meteorological information request, and at the same time it fosters covering the communication requirements of regional and global aviation considering their growth rates projected towards year 2025.

1.3 The Conference also recognized that the use of digital ATIS and pre-departure clearance as well FANS-1/A avionics package for controller-pilot data link communications (CPDLC) and ADS based on ACARS and Mode S, would bring real operational benefits for.

1.4 The Third Regional Air Navigation CAR/SAM Meeting (CAR/SAM/3 RAN) recommended the planning and implementation of the new CNS/ATM systems technologies, in accordance with the Global Air Navigation Plan for CNS/ATM Systems.

1.5 The CAR/SAM/3 RAN Meeting agreed upon several recommendations on the SMA(R) Plan and the use of frequency spectrum in VHF, including those forecasts that facilitate the introduction of the use of VDL.

1.6 On the other hand, GREPECAS recommended to the States and International Organizations to work in trials and studies oriented towards the implementation of air-ground communications established in the Global Air Navigation Plan for CNS/ATM Systems, including the air-ground data links (VDL, HFDL and S Mode).

1.7 In accordance with the guidelines of GREPECAS, in the CAR/SAM Regions measures to improve and develop voice and data air-ground communications have been applied with the following main objectives:

- a) optimise the use of communication services;
- b) improve VHF and HF coverage;
- c) protect from interference;
- d) implement character-oriented ATIS data links;
- e) implement ACARS; and
- f) others.

1.8 According to studies carried out by GREPECAS, the implementation of data link communications applications is considered feasible, such as CPDLC. In addition, some States of CAR/SAM Regions have already carried out tests using ACARS protocol for ATM applications have started trials in VDL Mode 2 and demonstrations of the ADS-C System. Some Area Control Centres have already been updated with the data processing capability with these new technologies.

1.9 Likewise, the States and International Organizations de the CAR/SAM Regions have implemented the air-ground communications requirements, indicated in the FASID Table CNS 2A and in accordance with ICAO Annex 10, Volumes III and V, making use of analogical VHF DSB-AM of 25 kHz channelling. technologies, for communications coverage in ground zones and in HF for communications in oceanic and remote zones. In those regions no saturation has been produced in the frequency band 117.975-137 MHz; but a higher congestion in the frequency assignment in the 118-118.925 MHz sub-band has been noticed, assigned to the aerodrome control service

2 Discussion

2.1 In some airports, where there is excessive operational information to be diffused, pilots are obliged to use more time to transcribe the contents. Additionally, in some occasions, it is not possible to include in the assigned time interval in the broadcast, the critical information or SIGMET; in those cases, broadcasting in a VOR channel has been used as an alternative means, which in turn imposes more disadvantages and delays to the pilots to listen to and/or transcribe the required information.

2.2 The pre-departure clearance (PDC) is communicated to aircraft by oral means in a designated VHF frequency. When there is higher activity of air operations in the peak hours at the airport, saturation of the frequency may occur through oral radio communications congestion for the delivery of pre-departure clearance. This causes delays and adversely affects the ATC operational efficiency, a situation that will be more complex as the global air traffic increases.

2.3 **Operational application of data link (DL)**

2.3.1 In order to overcome the aforementioned problems, the use of data link communications technology, available under CNS/ATM systems, is a good alternative for the application of data link in the ATIS and delivery of pre-departure clearance (D-ATIS, PDC) for aircraft with adequate communications equipment and the hardware required to access and/or receive the complete text of D-ATIS and PDC messages. In this way, the implementation of the data link communications also fosters the use of already available avionics, in a more efficient way.

2.3.2 Texts containing operational terminal area information and pre-departure clearance may be prepared and updated dynamically to be offered to access databases, which may be managed and stocked in digital recording by Civil Aviation Authorities, as specified in Annex 11.

2.4 **Operational benefits**

2.4.1 In light of the experience acquired by pilots, IATA, the airlines and the air traffic controllers in other Regions on data link D-ATIS and PDC implementation, the benefits concerning air operations and/or safety matters, are, among others:

- a) reduction in workload for pilots and controllers;
- b) greater data integrity;
- c) removal of errors due to reception/transcription;
- d) no time constraint and no coverage limitation for pilots to obtain the ATIS/VOLMET information;
- e) reduction in radio channel congestions for PDC delivery;
- f) enhanced flight efficiency and safety;
- g) receiving at will by the pilots;
- h) most updated information; and
- i) quick access to specific information in the ATIS/VOLMET/PDC.

2.4.2 Since CPDLC has been used, it has generated increasing benefits and the ATS providers and operators have gained greater experience with the technology, which includes support for satellite navigation as well concrete benefits such as reduction in separation minima, dynamic routing and reduction in communications costs.

2.4.3 Some ATS providers have also implemented applications of the CPDLC capability such as Pre Departure Clearance, Automatic Terminal Information Service, Taxi Clearance Delivery and Terminal Meteorological Information. The NAT Region has been using CPDLC applications for Position Reports via data link in lieu of HF Voice Radio. The results of the trials to date show that 85% of the pilot-controllers workload has been reduced; without CPDLC the supporting HF infrastructure would be seriously overloaded today. Based on the benefits obtained through these applications, an increasing number of ATS providers is implementing CPDLC and/or are planning to do so in the coming years.

5. **Conclusion**

5.1 ATS providers database management and the data link communications are compatible with the ATM system through the exchange of substantial information for collaborative decision-making. The applications of the D-ATIS and PDC data link communications have satisfactorily proven wide benefits for the operations and/or air safety.

5.2 Bearing in mind the information expressed in the paragraphs above, the States/International Organizations of the E/CAR area should take the initiatives towards the implementation of data link communications in D-ATIS and PDC operational applications at the main airports of the CAR/SAM Regions using data link technologies after a data and integrity checking period, so that all the ATM community may obtain the aforementioned benefits. To this end, the Meeting should take note of the information presented in this working paper.

6 **Suggested action**

6.1 The Meeting is invited to adopt the following:

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CONCLUSION 3/X IMPLEMENTATION OF THE D-ATIS AND PDC SERVICES IN THE HIGHER TRAFFIC DENSITY INTERNATIONAL AERODROMES OF THE CAR/SAM REGIONS

That the E/CAR States/Territories/International Organizations:

- a) note the operational and/or air safety benefits identified as a result of the applications of data link communications;
- b) develop, in coordination with NACC Regional Office, an action plan to use available ATS data link technology in order to exercise operational procedures and effectively improve awareness, with immediate benefits for ATS providers and users in the ECAR; and
- c) present in the next ECAR/IWG/29 the action plan to use available ATS data link technology.