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WORKING PAPER

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**Seventh Eastern Caribbean Network Technical Group (E/CAR/NTG/7) and
Fifth Eastern Caribbean Radar Data Sharing Ad hoc Group (E/CAR/RD/5)**
Basseterre, St. Kitts and Nevis, 17 – 18 October 2016

Agenda Item 4: Surveillance Sharing Activities
**4.3 Automatic Dependent Surveillance – Contract (ADS-C) and Automatic
Dependent Surveillance - Broadcast (ADS-B)/MLAT developments**

ADS-C and ADS-B/MLAT DEVELOPMENTS

(Presented by Trinidad and Tobago)

EXECUTIVE SUMMARY	
This paper serves to update the meeting of the work done by Trinidad and Tobago in the areas of Automatic Dependent Surveillance – Contract (ADS-C) and Controller-Pilot Data Link Communication (CPDLC).	
Action:	The suggested actions are presented in Section 3.
Strategic Objectives:	<ul style="list-style-type: none">• Safety• Air Navigation Capacity and Efficiency
References:	<ul style="list-style-type: none">• FANS 1/A CONOPS for the PIRCO FIR

1. Introduction

1.1 Following from E/CAR/CATG/2 CONCLUSION 1/12, CPDLC and ADS-C were implemented for operational use on July 7, 2016. Communications and situational awareness has been greatly enhanced in the Oceanic Sector, resulting in enhanced safety, improved efficiency and reduction in harmful CO2 emissions.

1.2 The goal of implementing fifty (50) Nautical Miles longitudinal is still being pursued. Provision is made in ICAO PANS-ATM (DOC 4444) for this separation minima with the availability of direct controller-pilot communication and position reporting at an interval of, at most, every twenty four (24) minutes. Operational use of Controller - Pilot Data Link Communication (CPDLC) has been available for three (3) months (at the time of this meeting), when more exposure has been gained by Controllers in this area, the reduction of separation could be pursued. With a PBN specification for aircraft and stipulated ADS-C reporting interval, the longitudinal separation could be further adjusted.

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2. Discussion

ADS-C Update

2.1 A period of ADS-C testing and trials was conducted between May, 2015 and start of service (July 7, 2016). At start of service all of the Controllers who routinely work in the Oceanic Sector were certified competent in FANS 1/A services. Training is ongoing to certify all the ACC controllers in FANS 1/A operation. The training and certification process is in accordance with that approved by the TTCAA Safety Regulators. All current ACC controllers would be certified in FANS 1/A and this would be included as part of the standard training package for future ACC controllers.

2.2 Advanced ATM Systems are capable of transmitting a Contact Advisory (FN_CAD) message to suitably equipped aircraft. This message instructs the airborne avionics to contact the subsequent ANSP via the ACARS Address of that ATM system. This is done without controller or pilot input. In the current software of the Piarco ATM system this feature is not available, however, in the pending upgrade this would be one of the capabilities to be added. Since the FANS 1/A was launched, the neighbouring FIRs of New York and Santa Maria have been using FN_CAD messages to instruct aircraft to logon to the Piarco ATM system.

2.3 Although flights are encouraged to retrain their CPDLC connection in the continental portion of the FIR it is recommended that the ADS-C connection be terminated on entering surveillance airspace. This reduces instances of dual tracks being displayed to the surveillance controller.

Automation and Customization

2.4 During the pre-implementation trials a comprehensive list of features to automate has been compiled. These include inter alia:

- a) End_Service message
- b) FN_CAD message
- c) Next Data Authority message
- d) "Welcome" message that would indicate what a flight can expect in the sector

Service monitoring

2.5 The ICAO Global Operational Data Link Document (GOLD) defines the Required Surveillance Performance (RSP) for ADS-C. Although it is beneficial to monitor the RSP in any application it is a necessity if ADS-C is to be used to reduce separation to fifty (50) or thirty (30) nautical miles longitudinally (with a PBN stipulation).

2.6 The Communication Service Provider (CSP) provides a monthly report of the performance of the Data Link service, however, it would be prudent for the TTCAA to conduct independent monitoring. The process to be employed will involve data mining of a relatively large data set. The mechanism to perform this is yet to be finalized.

2.7 The fault reporting form attached to the FANS 1/A AIC is a mechanism for users to report deficiencies. Although the form is yet to be used, operators have used the email address of the Centralized Reporting Unit (CRU) to address queries. Using the CRU email enquires reach persons who can provide follow-up action in a timely manner and communicate the response in the most direct path.

System Safety Assessment

2.8 The safety assessment conducted prior to commencement of the FANS 1/A service was to the satisfaction of both the TTCAA ANSP Safety Unit and the Regulatory Department. The mitigations suggested have ensured that all identified hazards to FANS 1/A operations bring the risks into an acceptable range.

2.9 There is availability of CNS support onsite between 6:00AM - 11:00 PM (local) and offsite support outside these hours. The system has been stable but an occasional there has been a disconnection of the Air Ground Data Link (AGDL). This has been reported to the ATM system supplier and is receiving attention, in the interim the CNS staff ensures that the Air Ground Data Link could be rebooted within twenty (20) minutes.

Regulatory Activities

2.10 The activities associated with FANS 1/A conform to the processes approved by the TTCAA Regulator. The assessment of competence in the use of FANS 1/A is done by Air Traffic Examiners (ATE) who act on behalf of the TTCAA Regulator. Though an ATC License endorsement is not issued on certification of FANS 1/A, it will form part of the annual renewal of Controller proficiency.

2.11 ADS-B is considered surveillance and it would be proposed that it be treated in a manner similar to any other surveillance mode. The precedence ANSPs such as the FAA and Australia would be used to bolster this position.

2.12 Work has been done through the ICAO NACC office (ADS-B AD-HOC/1) to define the technical specifications and concept of operations (CONOPS) for ADS-B in the NAM/CAR. The ADS-B Task Force has submitted a draft report to effect these and it has been distributed through the chair of the ad-hoc group.

3. Suggested actions

3.1 The Meeting is invited to:

- a) Take note of the information provided; and
- b) agree to any other actions as deemed appropriate.