International Civil Aviation Organization

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Agenda Item 5: Provision of ATM/AIS/SAR in the Asia/Pacific Region, including associated CNS matters

Realisation of Increased Efficiency and Capacity via ATS Inter-facility Data-link Communications (AIDC)

(Presented by Hong Kong, China)

SUMMARY

This paper presents the experience of Hong Kong, China on trials and realisation of the ATS Inter-facility Data-link Communications (AIDC) using a standalone system to reduce ATM personnel workload, increase efficiency and capacity, and strengthen flight safety. Under the ATM modernisation project, the Hong Kong Civil Aviation Department (HKCAD) is engineering a new ATM System with integrated AIDC capability that will enable smooth and structured testing and implementation of AIDC with all the neighbouring air traffic services (ATS) authorities in 2013.

This paper relates to –

Strategic Objectives:

A: ***Safety*** *– Enhance global civil aviation safety*
D: ***Efficiency*** *– Enhance the efficiency of aviation operations*

Global Plan Initiatives:

GPI-2 Reduced vertical separation minima
GPI-6 Air traffic flow management
GPI-7 Dynamic and flexible ATS route management
GPI-22 Communication infrastructure

1. INTRODUCTION

1.1 The first launching of AIDC operation in Hong Kong China was between Hong Kong ATCC and Sanya ACC on 8 February 2007. The AIDC was carried out on a standalone system platform that made use of flight data tapped from the ATM system. The AIDC implementation was very successful resulting in reduction of controller's workload and elimination of possible human errors arising from voice communications through Inter Area Speech Circuit.

1.2 Since then, further AIDC technical tests were or are being conducted with other ACCs such as Guangzhou, Taibei, Zhangjiang with a view to implementing AIDC on the same standalone system platform. The lesson learnt and experience gained from the AIDC tests/trials are incorporated in the design of a new Air Traffic Management System (ATMS) of the Civil Aviation Department of Hong Kong, China (HKCAD).

2. DISCUSSION

Further AIDC Tests

2.1 The technical test with Guangzhou covered nearly all of the 13 core AIDC messages. The test revealed that some advance features in APAC ICD Version 3.0 were not supported, such as Mach number technique, block levels and offset. However, the key stumbling block to implementing AIDC with Guangzhou is the short distance of flight transfer taking off from Guangzhou airport that the standalone system required a bit longer preparation time prior to coordination in transfer of control. This problem is expected to be resolved by using the new ATMS with automated and integrated AIDC function.

2.2 The technical test with Taibei ACC on all the core AIDC messages conducted in February 2012 revealed 2 technical issues, viz. Cyclic Redundancy Check (CRC) algorithm mismatch and processing of LAM and LRM messages. While the former technical problem has been resolved, the operational trial with Taibei could only be commenced when software modification of the Taibei ATM system is complete. For operational trial with Taibei using the HKCAD standalone AIDC system, it will initially be confined to use of reduced set of AIDC messages, i.e. EST, ACP, LAM, and LRM.

2.3 The technical test with Zhangjiang ATCU was completed in April 2012 based on 8 AIDC core messages, i.e. EST, ACP, TOC, AOC, ABI, MAC, LAM and LRM as other core messages are currently not supported by the system at Zhangjiang ACC. Planning of further operational trial will be arranged in due course.

Modernization of the ATM system of Hong Kong, China

2.4 The project for modernization of the ATM system, hereinafter referred to as “the System”, of Hong Kong, China was formally kicked off in 2007 after obtaining funding approval. The goal is to replace the existing ATM System which was commissioned in 1998 by a new System that is on a par with the most advanced systems adopted globally. The new ATM System will be installed in a new air traffic control centre located in the new HKCAD headquarters building. The air traffic control centre building of the new HQs is ready for equipment installation since January 2012.

2.5 The System comprises many major systems and the most important and critical one is the Air Traffic Management System (ATMS). The ATMS will handle much enhanced data transmission, processing and display power as well as high handling capacity to meeting air traffic growth in the Hong Kong FIR. Among other enhanced features, functions and safety nets, the new system will have an integrated AIDC function which addresses and resolves all these lessons learnt from the AIDC technical tests and operational trials using the standalone system. The key points are highlighted below for sharing: -

(a) As it is highly probable that the neighbouring ACC/ATCU are at differing pace of AIDC implementation, it is important that the ATMS should be able to support the latest ICAO version as well as lower versions so as to substantially realize the benefits of AIDC to reducing workload of ATM personnel, increasing efficiency/capacity and strengthening of flight safety.

(b) It is beneficial to incorporate all AIDC core messages in the system design despite only a subset of core messages will be implemented to suit local implementation. This will help save time and budget for subsequent software upgrade.

(c) Despite ICAO has provided guidance material on AIDC implementation, there exist grey areas and different interpretation in data field and CRC setting by the equipment manufacturers that would lead to compatibility problem as mentioned in paragraph 2.2 above. It is hoped that the "Pan Regional Interface Control Document for AIDC" (PAN ICD) would address all these observations.

(d) It is extremely important for States to allow ample time for conducting AIDC interoperability tests as fixing of anomaly identified by the ATM system manufacturer normally takes at least a few months. The new ATMS of HKCAD will be ready for AIDC tests with adjacent ATS authorities in early 2013.

(e) The AIDC messages set in supporting electronics notification and transfer of control between adjacent ATS authorities should be mutually agreed by way of letter of agreement or other means based on the specific operational needs and local environment.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information presented in this paper,

b) arrange AIDC tests with neighbouring ATS authorities soonest possible so as to reap the operational benefits of AIDC to reduce workload of ATM personnel, increase efficiency/capacity and strengthen flight safety, and

c) support a coordinated AIDC implementation plan in this Region in line with the ICAO Aviation System Block Upgrades initiative B0-25.

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