International Civil Aviation Organization

THE FIRST MEETING OF ASIA/PACIFIC ATS INTER-FACILITY DATA-LINK COMMUNICATION (AIDC) IMPLEMENTATION TASK FORCE (APA TF/1) OF APANPIRG

Bangkok, Thailand, 16 -18 June 2015

Agenda Item 8: **Sharing of experience on AIDC implementation including training and implementation packages**

PROGRESS OF AIDC IMPLEMENTATION

(Presented by Singapore)

SUMMARY
This paper presents the progress of AIDC implementation in Singapore with adjacent FIRs.

1.   INTRODUCTION

1.1   Singapore's new ATM system, LORADS III, was operationalized in October 2013. It brought about a generational shift in ATM capability which included various automation capabilities such as AIDC.

1.2   Singapore has taken a phased approach to implement AIDC with the ultimate aim to have all-round AIDC with all the adjacent ATS units surrounding the Singapore FIR. The development of an AIDC implementation roadmap takes into account the volume of traffic (which implies the volume of ATC coordination required to be undertaken), the development of ATM systems in the adjacent ATS units and the readiness for AIDC implementation. While the initial planned version of AIDC for LORADS III was version 3.0, Singapore elected to install the earlier AIDC version to ease the introduction of AIDC as it was envisaged that only some basic messages will be introduced at the start of AIDC operations and also to minimize compatibility issues with neighbouring FIRs.

2.   IMPLEMENTION PLAN

Vietnam (Ho Chi Minh FIR)

2.1   Recognizing the benefits that AIDC will bring to ATM operations, Singapore commenced discussions with Viet Nam (Ho Chi Minh FIR) for the conduct of AIDC trials after the successful implementation of LORADS III in October 2013. The following ATS routes (L625, L642, L644, M753, M768, M771 and N892) constituted 21% of the traffic in Singapore FIR and it is recognized that the potential benefits of AIDC implementation will be high

2.2   A multi-phased approach was jointly developed to ease the introduction of AIDC, bearing in mind the differences in design and automation of the two ATM systems. It was also agreed to introduce selected AIDC messages progressively in phases, gradually introducing AIDC operations to ATC. Phase 1 AIDC messages are limited to: EST, ACP, LAM and LRM. After a series of trials and finalisation of parameters, this was implemented on 24 July 2014.   For Phase 2, ABI, TOC and AOC will be introduced. Operational trials will commence on 15 June 2015. The sample statistics for EST messages exchanged from January-May 2015 are as follows:

	EST messages	Successful EST with ACP	Unsuccessful EST	Remarks
Total	53747	50340 (93.6%)	3407 (6.4%)	Please refer to Para 3.1 for implementation issues
Incoming	32738	30282 (92.5%)	2456 (7.5%)	
Outgoing	21009	20058 (95.5%)	951 (4.5%)	

Malaysia (Kota Kinabalu, Kuching and Kuala Lumpur FIRs)

2.3   Singapore and Malaysia initiated discussions on AIDC implementation in November 2014. Technical tests were conducted with Kota Kinabalu, Kuching and KL ATCCs from December 2014 till April 2015. Discussion on AIDC implementation is still in progress and the operational implementation of AIDC operations is planned to commence by December 2015.

2.4   AIDC operations will begin with Kota Kinabalu ATCC as the 3 ATS routes (M78, M768 and L517) make up close to 13% of the traffic movements in the Singapore FIR. AIDC operations for Kuching and Kuala Lumpur ATCCs will be progressively introduced by February 2016.

Philippines (Manila FIR)

2.5   Singapore conducted an initial test with Manila FIR on their interim system in December 2014 and further tests are planned to assess the readiness of AIDC implementation with Manila ACC.

Indonesia (Jakarta FIR)

2.6   Singapore understands that Jakarta will have AIDC capability in September 2015 and is ready to commence discussions on AIDC trials as soon as practicable. A significant coordination workload reduction is expected when AIDC is eventually implemented with Jakarta ATSU as the traffic movements between Jakarta and Singapore FIRs constituted approximately 30% of the total traffic movements in the Singapore FIR.

2.7   The various activities that has been conducted or planned for AIDC implementation with adjacent FIRs are summarized in the table below:

State/ATC unit	Technical test commencement	Implementation date	AIDC messages	Remarks
Vietnam/Ho Chi Minh ACC	December 2013	24 July 2014	Phase 1 (24th July 2014) : EST, ACP, LAM, LRM Phase 2 (3Q 2015): ABI, TOC, AOC	Phase 2 operational trials started on 15 June 2015
Malaysia/ Kuala Lumpur, Kota Kinabalu and Kuching ATCCs	December 2014	December 2015: Kota Kinabalu ATCC January 2016: Kuching ATCC February 2016:	ABI, EST, ACP, LAM, LRM, TOC, AOC	Messages for different phases and ATCCs are yet to be finalized. Coordination meeting planned for July 2015 for discussion.

		Kuala Lumpur ATCC		
Philippines/ Manila ACC	December 2014	December 2015	ABI. EST. ACP, LAM, LRM, TOC, AOC	Initial testing December 2014 with interim system. Further technical testing will be scheduled for July 2015.
Indonesia/Jakarta ATSC	TBA	December 2016*	ABI. EST. ACP, LAM, LRM, TOC, AOC	Jakarta ATSC expected AIDC capability in September 2015. Discussions on AIDC implementation to commence in 3Q 2015.

3. IMPLEMENTATION ISSUES

3.1 The AFTN network was selected as the media to support the exchange of AIDC messages as the established infrastructure is already available and it has the ability to re-direct messages through alternate paths in the event of a direct connection failure. Through the various technical testing with adjacent FIRs, several issues were encountered:

   a) Message timeout errors due to the re-routing of messages caused by the failure of the direct AFTN link;
   b) Rejected EST message due to invalid DEP message (The ATM system carries out an internal check on DEP messages against EST reception, invalid DEP messages with a big different in timing will trigger a rejection of the EST message);
   c) Rejected EST message due to missing or multiple flight plans;
   d) Cyclic Redundancy Check (CRC) errors due to ATMS generating extra spaces in messages.

3.2 The issues that were attributed to AFTN network and flight-planning have been resolved through tuning and adjusting parameters and engagement with operators. Software corrections have also been made to ensure correct handling of AIDC messages. The experiences gained from these technical trials will serve as a good reference when defining the bilateral agreements between ACCs for AIDC message handling.

4. BENEFITS OF AIDC IMPLEMENTATION

4.1 The introduction of AIDC has brought about the benefits such as reduction of controller workload. Errors such as large height deviations are eliminated as human errors are minimized with the automated coordination process. Although only a small message set is used currently, the benefits of AIDC operations has reap substantial benefits to Singapore as voice coordination is reduced drastically. The weaving of the coordination process into the AIDC workflow has enhanced the work processes of our controllers, with HMI indications to reflect the coordination that is automatically initiated and accepted for agreed coordination level bands.

5. ACTION BY THE MEETING

5.1 The meeting is invited to note and discuss

   a) the progress of AIDC implementation in Singapore FIR;

   b) the issues faced during AIDC implementation, and

   c) the benefits of AIDC implementation.

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