



International Civil Aviation Organization

**THE SECOND MEETING OF ASIA/PACIFIC ATS INTER-FACILITY
DATA COMMUNICATION (AIDC) IMPLEMENTATION TASK FORCE
(APA TF/2) OF APANPIRG**

Bangkok, Thailand, 16 - 18 March 2016

AIDC Trial with Thailand's Adjacent FIRs
(Presented by AEROTHAI)

SUMMARY

This paper presents the AIDC test activities between Thailand and some of its adjacent FIRs and some of the problems found during the test.

1. INTRODUCTION

1.1 Thailand has four adjacent FIRs with which it has to do the transfer of control authority – Cambodia, Lao PDR, Malaysia and Myanmar.

1.2 Up till now, Thailand has cooperated with Cambodia and Lao PDR regarding the initial trial on AIDC message exchange.

1.3 Recently, Thailand has carried out the initial trial on AIDC message exchange with Cambodia and Lao PDR. There are two main software defects found during the test: CRC error and message identification number (ODF option 2) jump.

2. DISCUSSION

CRC Error

2.1 CRC or cyclic redundancy check is used to ensure end-to-end message integrity. As described in 2.1.6 of PART II (Communications and support mechanisms) of the Asia/Pacific ICD for AIDC, CRC is conveyed in ODF option 5. The CRC is calculated beginning from opening parenthesis to closing parenthesis and non-printable characters such as carriage return (CR), line feed (LF) must not be included in the calculation.

2.2 However, CRC calculation within some of the ATM systems does, by mistake, include the CR/LF.

Message identification number jump

2.3 The message identification number (ODF option 2) described in 2.1.3 of PART II (Communications and support mechanisms) of Asia/Pacific ICD for AIDC is a 6-digit number assigned to messages that require confirmation.

2.4 As described in 2.2.2 of Appendix D (Implementation Guidance Material) of the Asia/Pacific ICD for AIDC, message identification number must be sequential and a number that is out of sequence means that something is wrong with the system.

2.5 As shown in Figure 1, Thailand's ATM system is connected with multiple ATM systems (in this case, during the trial, Lao PDR and Cambodia) while it has only a single queue for all messages it has to process, i.e., aircraft movement, NOTAM, MET, AIDC messages, etc.

2.6 Within the same queue as all other messages where the sequence number is specified by channel sequence number (CSN), AIDC messaging additionally has another layer of message queues/sequence numberings controlled by message identification number (ODF option 2). These AIDC message queues/sequence numberings have to be created on the basis of AIDC endpoints. Therefore, there should be one AIDC message queue/sequence numbering mechanism per other AIDC communication party.

2.7 However, since Thailand's ATM system has only one single queue for all messages, conflict on AIDC message identification number has been found. As shown in Figure 2, the AIDC software within the ATM system altogether creates and has control over only the single AIDC message queue/sequence numbering and hence all of the AIDC messages, regardless of their destination addresses, are considered in the same queue/sequence numbering.

2.8 The possible solutions for this error could be either that:

- a) the AIDC software, while remaining having one AIDC message queue for all AIDC communication parties, not mistakenly takes into account different AIDC communication parties (based on different destination addresses) and keeps control of different AIDC sequence numberings; or that
- b) the AIDC software creates and has control over multiple message queues/sequence numberings in accordance with multiple different AIDC communication parties.

Fixing the software

2.9 Thailand, Cambodia and Lao PDR are now in the process of contacting the manufacturer to fix the problems found in their ATM software.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this papers;
- b) particularly take into account the message identification number jump error during the ATM system requirement specification and/or acceptance processes.
- c) discuss any relevant matters as appropriate.

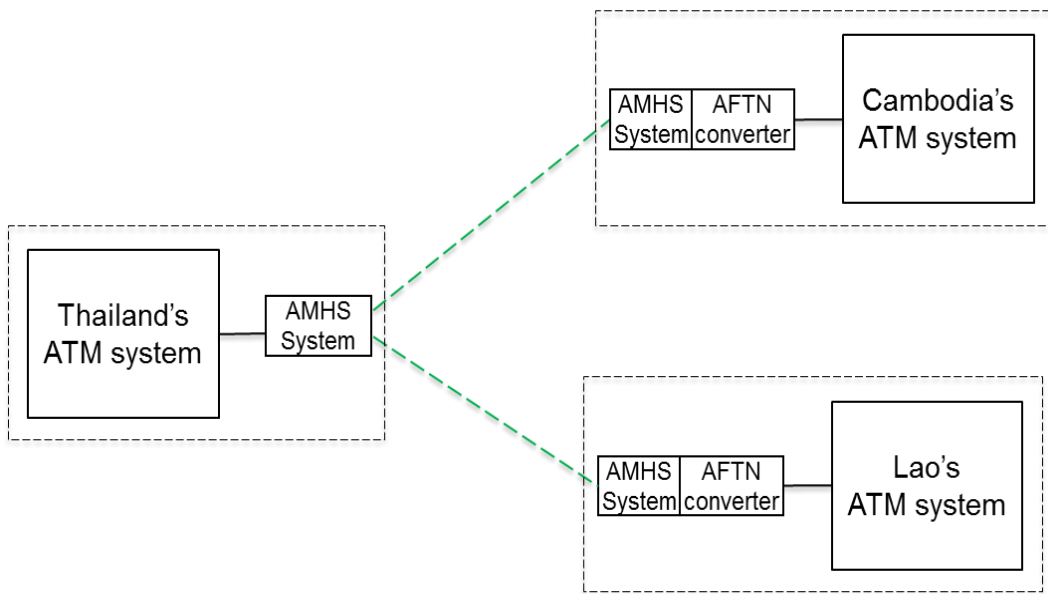


Figure 1 The ATM systems' connection diagram.

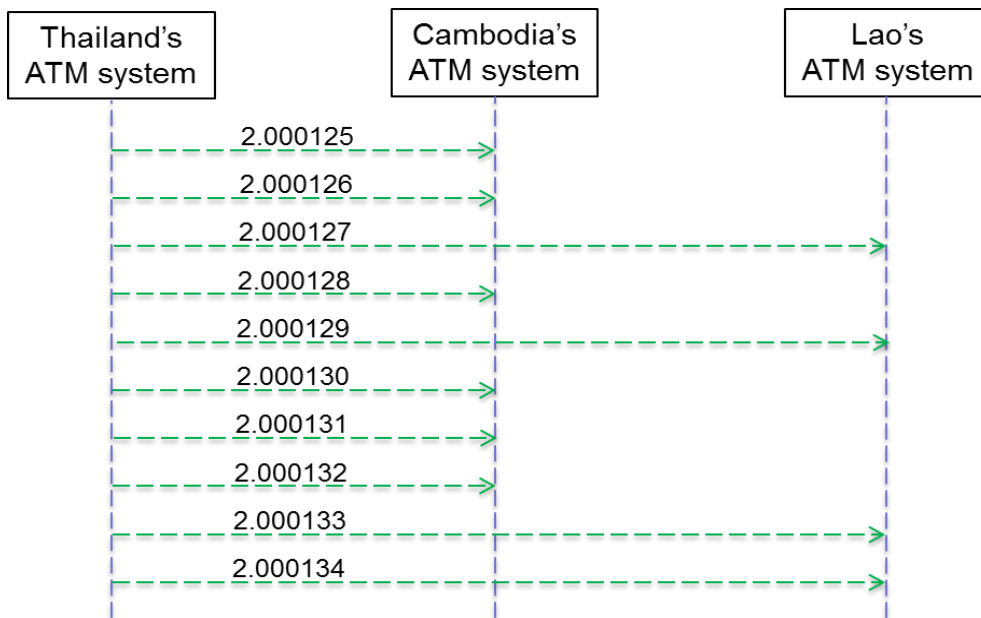


Figure 2 Outgoing AIDC message identification sequence numbering – Out of sequence

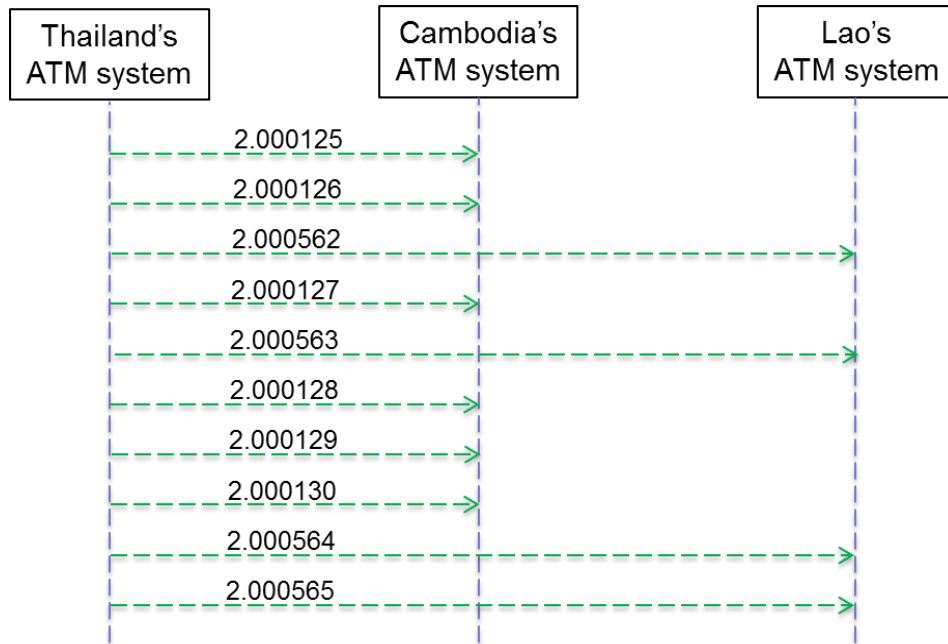


Figure 3 Outgoing AIDC message identification sequence numbering – Ideal case