International Civil Aviation Organization

Seventh Meeting of the Asia/Pacific ATS Inter-Facility Data-Link Communication Implementation Task Force (APA TF/7) of APANPIRG

Video Teleconference,

Agenda Item 3: Sharing of experience on AIDC implementation and update the implementation status

CHINA AND LAOS STARTED THE AIDC PRE-OPERATIONAL TRAILS

(Presented by China)

SUMMARY

This paper presents China and Laos started the AIDC pre-operational trials.

1. INTRODUCTION

1.1 With the rapid development of the civil aviation in the Asia Pacific region, China is actively promoting the Belt and Road cooperation. The continuous growth of the number of flights between Southwest China and its neighboring countries has led to the increasing demand for cooperation between neighboring FIRs and higher automation levels.

1.2 At present, Kunming FIR and Vientiane FIR are connected by an international route (A581), and the transfer point is SAGAG. Since the opening of the route, the flights flying over SAGAG have grown rapidly. According to the statistics in 2019, the daily average number of flights transferred to Vientiane FIR is 180, and 245 in the peak period.

1.3 Phased progress of AIDC technical test has been made between China and Laos after years of efforts. The AIDC pre-operational trials started on January 12, 2021. During the pre-operational trials, the success rate reached above 90%.

2. DISCUSSION

2.1 AIDC handover mode

During pre-operational trials, Kunming and Vientiane continue to do AIDC handover in simple mode. Both sides send ABI 15 minutes and EST 10 minutes before SAGAG automaticallyand send TOC and AOC manually.

2.2 The main problems

2.2.1 The transmission delay problem mentioned in the IP06 submitted last year by China has been solved. The AIDC messages are sent directly between two sides to reduce the number of intermediate nodes based on multiplexing the ground link system constructed by China in 2018. The network and AFTN server have been reconfigured synchronously. Since the start of pre-operational trials, both the host system NUMEN-2000 and spare system AirNet in China can carry out AIDC handover with TOPSKY in Laos normally. The success rate is above 90%.

2.2.2 Daily summary and analysis of the failed AIDC handover via emails have been made by technical staff from both sides. After analysis between both sides, the reasons for failed AIDC handover are as follows(exclude the human factor):

- The route in the ABI comes from the route in the related FPL. The TOPSKY system will reply LRM: FPL NOT PREAC or LRM: ERROR ATS TYPE due to it cannot process the ABI which contains STAR or longitude and latitude of the route point in the route.
- The TOPSKY system of Laos lacks the correction mechanism for the ETO. If the ETO deviates greatly from the ATO due to some reasons, the status of the flight plan in the TOPSKY will be incorrect. During the coordination period, the TOPSKY system will reply LRM: FPL NOT PREAC after the ABI is sent to Laos.

To solve the problem mentioned above, both sides will continue to discuss the solutions and contact relevant departments to standardize the FPL. We also suggest Laos update the ETO by using the AFTN EST sent by China, to reduce the problem of the wrong status of the flight plan in the TOPSKY caused by the deviation between the ETO and the ATO.

2.3 Work experience

During the Sixth Meeting of the Asia/Pacific ATS Inter-facility Data-link Communication Implementation Task Force (APA TF/6) of APANPIRG, China submitted IP06-The launch and promotion of AIDC handover between China and Laos. In the IP06, China introduced the solutions to the problems during AIDC technical test. The problems mentioned in the IP06 has been successfully solved and the work experience is as follows:

- About the data standards: During the previous technical test, the two sides encountered data standards inconsistency and a series of compatibility problems, such as unify the metric altitude into imperial altitude, add the route in the ABI and add the ODF-3 item in the AOC. Therefore, it is suggested that the ATC systems of both sides should strictly refer to ICAO data standards when conducting AIDC handover tests between member countries in the Asia Pacific region, to reduce AIDC failure caused by non-compliance with ICAO data standards.
- About the message forwarding and transmission routing: During the early stage of the technical test, both sides used the existing AFTN link to send and receive the AIDC messages. The 5 intermediate nodes between China and Laos caused long transmission delay. According to statistics, the longest delay time was 5min21seconds. Such long transmission delay cannot meet the requirements of the controllers' actual operation. The AIDC messages are sent directly between two sides to reduce the number of intermediate nodes. The following test showed the transmission delay was within 5 seconds, and the success rate significantly increased.
- About the cooperative work mode: Both sides used We Chat, email, and web conference to carry out the AIDC technical test.

It is suggested that the FIRs of neighboring countries in the Asia Pacific region should actively adopt the above cooperative work mode for communication, so as to improve the work efficiency and promote the implementation of AIDC in the Asia Pacific region.

2.4 Next steps

After negotiation between China and Laos, the relevant work plan for the next step to further promote the AIDC handover between these two sides has been achieved:

- Telephone handover will be canceled after starting the AIDC handover between China and Laos. In order to avoid the operational risk of the entry of unverified flights, the related software on the NUMEN-2000 automation system needed to be upgraded to have the prompt function of entry flights. The two sides maintain the pre-operational trials at present;
- Both sides will negotiate the time of AIDC handover and update the LoA after upgrading.

2.5 Significance of the work

- Reduced the workload of the controllers. According to statistics of no epidemic situation before 2020, AIDC pre-operational trials between China and Laos can reduce 180 telephone calls between Kunming FIR and Vientiane FIR every day. It has reduced the workload of the controllers.
- Improved the level of collaborative operation. AIDC pre-operational trials between China and Laos have accumulated precious experience for the AIDC handover test between China and surrounding countries, and also improved the collaborative operation level of Kunming FIR and Vientiane FIR.
- Improved the navigation safety of the border area. AIDC pre-operational trials between China and Laos have avoided the mistakes caused by the language problems of controllers on both sidesand improved the navigation safety of the border area.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate

– – – – – – – – – – – – –