International Civil Aviation Organization

Eleventh Meeting of the South China Sea Traffic Flow Review Group (SCSTFRG/11)

Bangkok Thailand, 04 – 06 July 2023

Agenda Item 3: Review of the Existing Traffic Flow Route Structures in SCS Airspace and Identifying Priorities

INTRODUCTION TO THE ROADMAP FOR ATS RECOVERY IN SANYA FIR

(Presented by CHINA)

SUMMARY

This paper presents the forecast of civil aviation recovery from COVID-19 pandemic in Sanya FIR. In order to provide better air traffic services for airspace users, and promote ATS safely and efficiently during the recovery, Sanya FIR formulates detailed ATS Roadmap during the period from 2023 to 2025. A phased roadmap has been developed, and most of the plans require a joint effort with stakeholders. Therefore, cross-border collaborations with Sanya FIR are encouraged to promote the rapid recovery from 2023 to 2025.

1. INTRODUCTION

1.1 From January to May 2023, the flight volume of the Sanya Flight Information Region has recovered rapidly, and domestic take-off and landing flights have exceeded that of 2019, with an increase of 2.3%. At the same time, the A1/A202/L642/M771, the main route in the Asia and Pacific region, has recovered to 66% of the average daily flight volume compared to May 2019. The A1 route accounted for 75% of the total number of flights in 2019.

1.2 COVID-19 pandemic brings about great changes in resources input, personnel capability, infrastructure, operation mode and so on in ANSPs, airlines as well as airports compare to 2019. However, with the urgent needs in interaction that cover the field of economy, policy, culture between countries, flight volume recovery becomes irreversible trend and will develop more rapid than the period before COVID-19 pandemic.

1.3 In order to provide better air traffic services for promoting ATS safely and efficiently during the recovery, Sanya FIR formulates detailed ATS Roadmap from 2023 to 2025.

2. DISCUSSION

Analysis of traffic volume on oceanic sectors in Sanya FIR

2.1 *Flights before 2019*. Flights on routes A1/L642/M771 from 2012 to 2019 are shown in the Figure 1 the average annual growth rate is 9.93%.

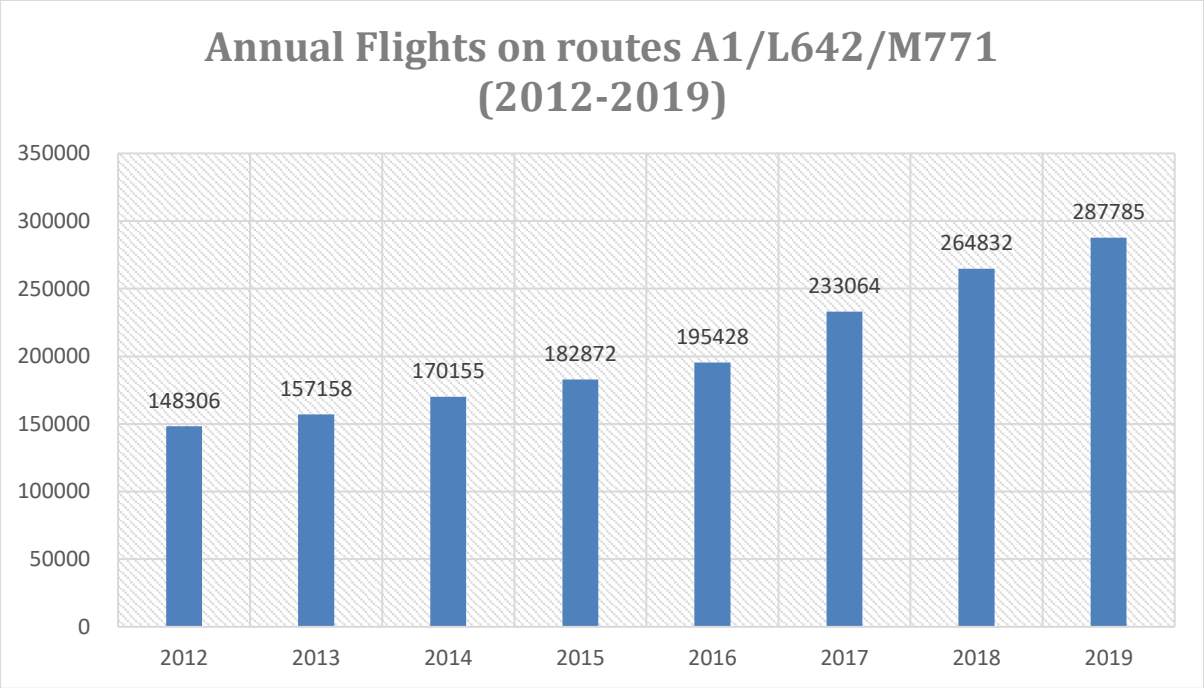

Figure 1 Annual Flights on routes A1/L642/M771 (2012-2019)

2.2 *Flights of 2020-2022.* Flights on routes A1/L642/M771 from 2020 to 2022 are shown in the Figure 2 that 2020 falls 67.73%, 2021 falls 75.8% compare to 2019, 2022 falls 71.2% compare to 2019.

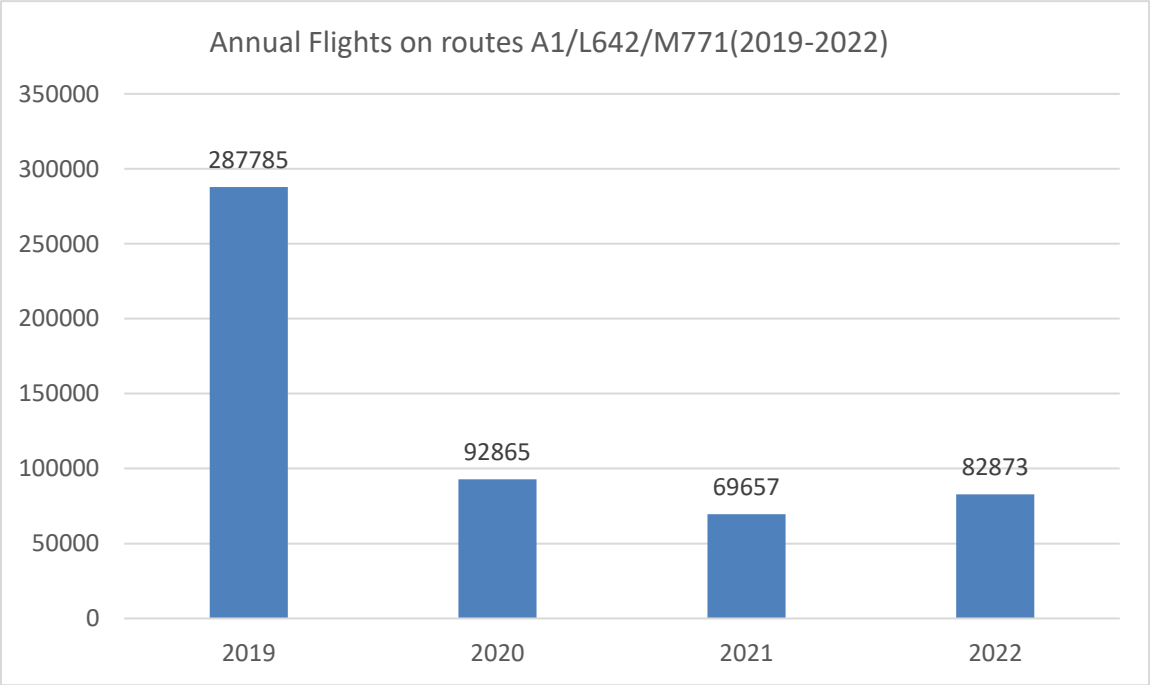

Figure 2 Annual Flights on routes A1/L642/M771 (2019-2022)

2.3 *Flights after 2023 (prediction).* The prediction in many ways shows that flights volume will bottom out and begin to rise and will basically return to the volume of 2019 in 2024/2025.Based on the flight growth rate from January to May 2023, it is expected that the flight volume of 2019 will

be reached in 2024, and the growth rate will be more than 6% from 2025. Therefore, we can conclude that the flight volume from 2023 to 2025 will respectively back to 70%,95%,105% of traffic volume compared to 2019.

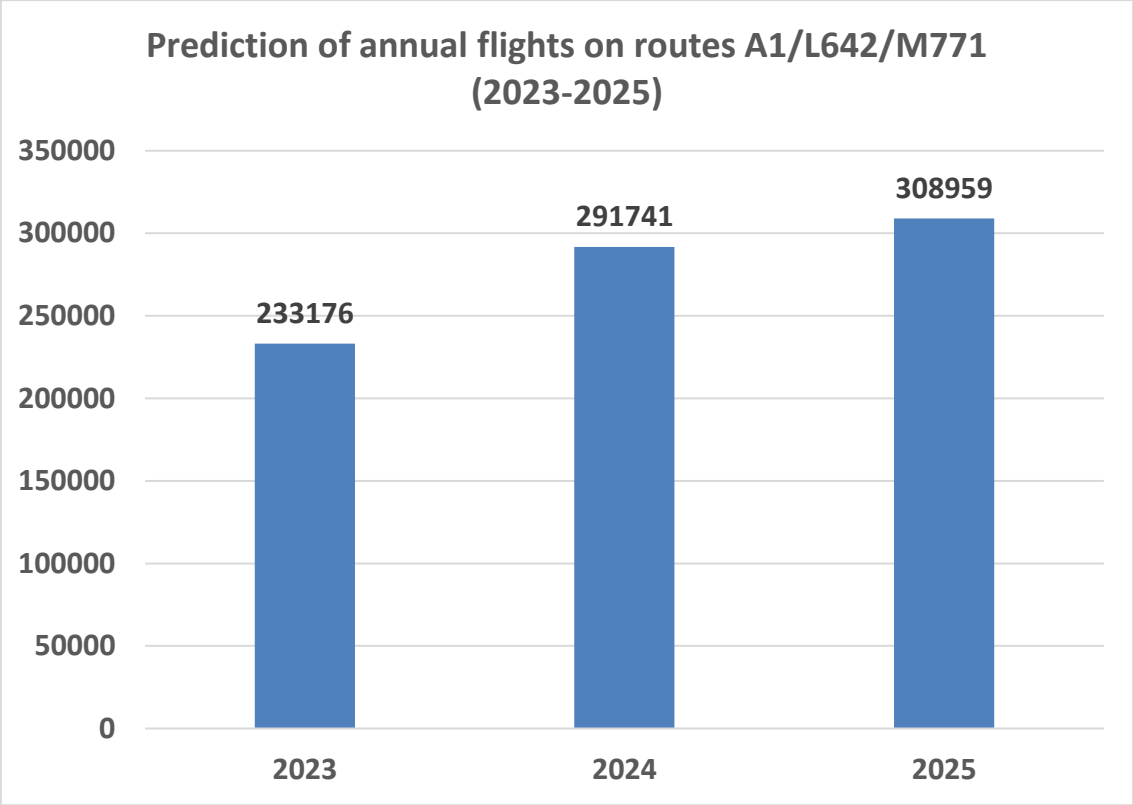

Figure 3 Prediction of annual flights on routes A1/L642/M771 (2023-2025)

2.4 According to figure 3, the annual rate of growth from 2022 to 2025 can be concluded shown in Table 1 as follows.

Year	**2022**	**2023**	**2024**	**2025**
Total	82873	233176	291741	308959
Annual rate of growth	18.90%	181.40%	25.11%	10.53%

Table 1 Prediction of annual rate of growth on route A1/L642/M771(2022-2025)

Air traffic services roadmap from 2023 to 2025

2.5 *PHASE1 (2023) phase of basic foundation and preparation.* From Figure 1, we can conclude that the growth rate of flights in 2023 is expected to be the highest in recent years (181.4% growth in 2023 compared to 2022), so there is an urgent need to make a series of preparations as follows.

- Continue the study concerned the route structure adjustment, achieve the initially commitment about the detailed plan.
- Carry out AIDC with neighboring ATC units, determine person of contact in the field of ATC and technical support and establish stabilized business connection between each other.

- Establishment of CPDLC in Sanya FIR, invite related units to introduce their own operational procedure, operational experience, and next step of work relevant to CPDLC.

- Information sharing. Basic information sharing can effectively establish common situational awareness for all air traffic control units to develop internal personnel training, risk management and operation procedures.

- Prepare the latest version of regulations and agreements which included level arrangement and supplement of ATFM and so on.

2.6 *PHASE2 (2024) The period of recovery*. In this phase, it is predicted that the flight volume will recover close to the situation in 2019 at the end of 2024, so implementation of related works should be carried out to get well prepared for the flight development in next stage.

- Initiate the feasibility study of the schedule sharing, and prepare preliminary work about A202 parallel route.

- Sign and renew cross-border LOA or MOC of ATFM;

- Put forward progress in shortening the longitudinal transfer parameters on L642 and M771;

- Discuss the application of WAM in Sanya oceanic area.

- Strengthened ADS-B surveillance capability in Sanya FIR, especially for the low altitude target.

2.7 *PHASE3 (2025-): The period of flight development.* This phase put emphasis on airspace structure adjustment, level arrangement optimization, separation reduction as well as application of new technology that helpful in improving airspace carrying capacity, in which efficient ATC service will become the motivation of flight development instead of bottleneck.

- Accomplishment of opening up parallel routes.

- CPDLC implementation in Sanya FIR.

- Carrying out appropriate information sharing.

- Fully transition from FLAS and FLOS.

Recent key work emphasis

2.8 *A1 parallel route*. According to historical data statistics, the flights requiring altitude change between BUNTA-IKELA of A1 route account for 40% of the total flights. With the continuous increase of flights, the risk of flight conflicts caused by controller human factors or pilot errors increases significantly. Although various advanced auxiliary equipment used to detect flight conflicts, the risk of flight conflict using near flight level is still a big challenge for air traffic controllers with the traffic demand increasing continuously. Therefore, the joint efforts along the ATC units of A1 to prepare the plan on parallel route need to be harmonized as soon as possible.

2.9 *L642/M771 navigation performance specification and handover interval adjustment*. The handover interval between Hong Kong, Sanya and Ho Chi Minh for L642/M771 at the same level is 50 nautical miles (without chasing)/based on a 10-minute Mach number technical interval (with catching up), while the handover interval between Ho Chi Minh and Singapore is only 20 nautical miles as far as we known. Hong Kong, Ho Chi Minh and Sanya have conducted preliminary communication on the

L642/M771 navigation performance specification and handover interval adjustment, and will further collaboratively promote this work.

2.10 *Complete AIDC implementation.* According to the average of 2 flights per handover call (including handovers, revisions, etc.), and Figure 3 "Prediction of annual flights on routes A1/L642/M771 (2023-2025)", it is estimated that in 2023, the daily average calls that Sanya contacts with Hanoi and Ho Chi Minh will be 319 times approximately. Controller's attention is greatly paid on simple handover information, resulting in inefficiency and handover mistakes that are easily made by a slip of tongue or other human errors during calls. Sanya, Hanoi and Ho Chi Minh have replaced ATC automatic equipment in recently years, which provides further possibility to implement AIDC in hardware and technology. It is recommended to speed up the AIDC test and put it into use.

2.11 *Increase transfer flight levels.* The handover flight levels on route A1 (FL310/FL320/FL350/FL360), and L642/M771 (F330/F340/F370/F380) are still not the NO-PDC levels at present. While these altitudes are economic for airline companies, effectively reducing controller's coordination work. It is recommended to reorganize the available levels of each trunk route fully considering the route structure, handover interval, flight flow distribution, etc.

2.12 *Collaboration on surveillance capabilities.* There are 9 ADS-B sites(YunLong\BaoAo\WuZhiMountain\DongDao\NanShan\MaLing\XIsha\ZhanJiang\NanNing) in the Sanya FIR, which completely cover the entire Sanya FIR. It is the second-level ADS-B data center of ATMB CAAC. It is the development direction in the future to provide air traffic services for general aviation through ADS-B.

2.13 *Optimize letter of agreement.* Revise the work agreement between the ATS units according to the changes in work (such as carrying out AIDC, optimization of the altitudes arrangement), especially based on the changes of air traffic flow management in recent years (normalized ATFM measures in the direction of Northeast Asia and level blocking caused by unidentified aircraft, etc.), ATS units expand the air traffic flow management part involved in agreement or discuss whether to sign a ATFM agreement separately.

2.14 *CPDLC operation experience sharing.* According to AIP, Ho Chi Minh and Singapore areas have used the combination of CPDLC/VHF as the main means of ground-air communication on L642/M771. Sanya FIR will gradually intensify and optimize CPDLC operations in the next few years, and hopefully further develops with relevant countries about CPDLC experience sharing and function optimization in the future.

2.15 *Solution to improve the safety redundancy of ATC services.* The secondary radar coverage, ADS-B coverage and VHF coverage between the area control and approach control of some ATC units in the Asia and Pacific Region are basically consistent or can be basically consistent after a small amount of modification. This allows emergency delegation of air traffic services to be provided between the area control and approach control of these ATC units. In April 2022, an emergency drill for the approach control unit to take over the regional control unit was carried out in Sanya FIR. During the exercise, the approach control unit performs the actual instruction of the flight within the area control scope. The coordination and transfer are also taken over by the approach controllers. In a real sense, the air traffic control units in different geographical locations in the region (Sanya area control and Sanya approach distance of more than 300 kilometers) realize emergency air traffic control services. As a result, the level of safety redundancy in ATC services across the Asia and Pacific region has been increased.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) encourage the close collaboration mentioned on this paper with Sanya FIR to promote the fast recovery of air traffic services from 2023 to 2025;

c) discuss any relevant matters as appropriate.

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