International Civil Aviation Organization

The Fifth Meeting of the South Asia, Indian Ocean and Southeast Asia ATM Coordination Group (SAIOSEACG/5)

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Agenda Item 3: Review of Current Operations and Problem Areas

PROGRESS ON THE TRIAL IMPLEMENTATION OF REDUCED LONGITUDINAL SEPARATION ON ROUTES L642 AND M771

(Presented by CHINA)

SUMMARY

This paper presents an overview of the trial implementation to reduce longitudinal separation on Routes L642 and M771, in response to the rapid growth of air traffic demand in the Asia-Pacific region and the resulting challenges in airspace capacity and operational efficiency. The trial, launched in May 2024, reduced longitudinal separation from 50 NM to 20 NM on the two routes. Since its commencement, the trial has demonstrated clear benefits in terms of increased route capacity, enhanced operational flexibility and improved inter-FIR coordination, while maintaining an acceptable level of safety. The paper summarizes the background, operational information and key milestones, identifies issues observed during implementation, and proposes the way forward.

1. INTRODUCTION

1.1 Driven by accelerating economic integration in the Asia-Pacific region, air traffic demand continues to grow worldwide, with the region experiencing particularly strong growth. ICAO has projected that Asia-Pacific air traffic will lead global growth, reaching approximately 12.4 billion passengers by 2050, underscoring the need to transform the way the movement of people and goods across borders is managed, as highlighted by the ICAO Secretary General.

1.2 While this trend significantly enhances regional connectivity, it also places increasing pressure on the efficient and sustainable use of limited airspace resources. Routes L642 and M771 are key international ATS routes serving as major corridors linking important economic centers across China, Hong Kong, China, Viet Nam, Singapore, Malaysia, and Indonesia. To alleviate capacity constraints, improve the utilization of flight levels and release additional operational potential while maintaining safety, Sanya FIR, together with the Hong Kong, Ho Chi Minh and Singapore FIRs, initiated a trial on 7 May 2024 to reduce longitudinal separation on these routes from 50 NM to 20 NM, following extensive coordination and technical assessment.

1.3 As of 31 October 2025, the accumulated trial operating time exceeded 2,954 hours, with 4,110 flights directly benefiting from the reduced separation. Owing to the release of additional flight level resources, the number of indirectly benefiting flights was significantly higher. Overall, the trial

has delivered positive results in increasing route capacity, enhancing operational flexibility, improving fuel efficiency and strengthening inter-FIR coordination. Confidence, acceptance and participation among all stakeholders have continued to grow, with the trial gradually evolving from an exploratory phase towards quasi-routine operations.

2. DISCUSSION

Operational Data and Trend Analysis

2.1 *Overall Operational Performance.* During the trial period, operational indicators for Routes L642 and M771 showed a steadily improving trend. Key metrics, including average daily operating hours and average daily benefiting flights, increased significantly. In April 2025, the trial achieved near-continuous daily coverage for the first time, with average daily operating hours reaching 17.63 hours, reflecting the growing confidence of all ANSPs in the reduced separation concept.

2.2 Between January and May 2025, the average number of benefiting flights reached 23.21 per day, representing an increase of approximately tenfold compared with the initial stage of the trial. This clearly demonstrates the feasibility and necessity of a 20 NM longitudinal separation under current operational conditions.

Period	Avg. Daily Operating Hours	Avg. Daily Benefiting Flights	Max. Daily Benefiting Flights
May–Dec 2024	2.53 hrs	2.26	22
Jan–May 2025	15.28 hrs	23.21	60

2.3 *Phased Progress and Key Milestones.* Several milestones of particular significance were achieved during the trial:

- 11 May 2024 – First Effective Operating Window. Despite persistent adverse weather, a five-hour trial operation was successfully conducted, marking the transition from planning to live operations.
- 25 December 2024 – 7th China–Viet Nam CNS/ATM Coordination Meeting. Agreement was reached to extend the trial operating window. Subsequently, average daily benefiting flights increased from 2.26 to 23.21, and average daily operating hours increased from 2.53 to 15.28.
- 29 December 2024 – First Extension Beyond the Agreed Time Window. The trial was proactively extended to 1600 UTC, with total operating time reaching 14 hours.
- 30 March 2025 – First Extension to 2300 UTC. Trial operations reached 22.4 hours, with 60 flights transferred using reduced separation, representing a record high.
- 2–3 May 2025 – Reduced Separation under LSWDCP Conditions. Reduced longitudinal separation of 30 NM and 20 NM was applied during adverse weather and LSWDCP activation, demonstrating enhanced operational flexibility and airspace management capability.

2.4 These milestones reflect the progressive deepening of mutual understanding and coordination among all ANSPs and provide a solid foundation for wider implementation.

Issues Identified During the Trial

2.5 *Differences in Standard Application and Coordination.* One of the most prominent challenges observed during the trial was the inconsistent application of standards under special operational conditions. Although multiple separation values (20, 30 and 40 NM) were applied in practice, clear and unified procedures have yet to be fully institutionalized. In complex situations such as weather deviations, some operations reverted to the conventional 50 NM separation without sufficient assessment, limiting the effective utilization of airspace resources.

2.6 *Technical Limitations and Airspace Efficiency.* In catching-up scenarios, the existing Mach number technique is overly conservative. For example, a speed difference of only 0.01 Mach may require the longitudinal separation to increase from 20 NM to more than 80 NM, resulting in significant inefficiencies in flight level utilization.

2.7 *Coordination Mechanisms and Contingency Response.* The trial also highlighted the need for more flexible coordination mechanisms, particularly during rapidly evolving weather or airspace constraints. Differences in information availability regarding airspace status, traffic demand and meteorological conditions further affect decision-making efficiency.

Way Forward

2.8 *Standardization and Agreement Revision.* It is recommended that States and administrations, based on the experience gained from the trial, initiate revisions to relevant ATC agreements to establish 20 NM as the default longitudinal separation on Routes L642 and M771. At the same time, it is recommended to establish clear, harmonized and differentiated scenario-based procedures, defining longitudinal transfer separation standards under various special operational conditions, including:

- where no catching-up aircraft are involved, a longitudinal transfer separation of 20 NM should be implemented;
- in cases of weather deviations or airspace constraints, the affected ANSP should initiate coordination at least 30 minutes in advance, and the separation may be increased as appropriate, but in principle should not exceed 50 NM;
- where catching-up aircraft are involved, an additional 20-30 NM should be applied on top of the existing separation, as an alternative to the overly conservative Mach number technique;
- Mach number-based longitudinal separation should be applied only when surveillance capability is lost, and when procedural control or contingency scenarios are in effect.

2.9 *Technical Enhancement and Information Sharing.* Further enhancement of CNS/ATM capabilities is recommended to support more refined separation management. In addition, a regional information sharing mechanism covering airspace status, traffic demand and meteorological information should be established to support coordinated decision-making and continuous optimization.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) develop a common understanding among the concerned ANSPs on longitudinal transfer separation standards applicable under different operational scenarios;

c) support the comprehensive implementation of a standard 20 NM longitudinal transfer separation;

d) discuss any relevant matters as appropriate.

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