



ICAO

International Civil Aviation Organization

**Thirty-First Meeting of the Regional Airspace Safety
Monitoring Advisory Group (RASMAG/31)**

Bangkok, Thailand, 29 June – 03 July 2026

Agenda Item 5: Airspace Safety Monitoring Activities/Requirements in the Asia/Pacific Region

ENHANCING SAFETY IN HOT SPOT B1 ATS ROUTE A593

(Presented by the Republic of Korea)

SUMMARY

In 2025, the Republic of Korea conducted a Safety Review of Hot Spot B1, the transfer of control point between Incheon ACC and Shanghai ACC. The review indicated that most of occurrences in the area were attributable to human factors. Accordingly, this paper proposes the implementation of Phase 2 of the “Consensus Document on the Phased Implementation of New Route Structure and Air Traffic Services” which includes the establishment and operation of AIDC, the development of a safety oversight mechanism for the delegated airspace, and the improvement of the airspace structure at the earliest possible, in order to enhance safety at Hot Spot B1. In addition, this paper proposes initiating discussions on the reduction of longitudinal separation minima based on enhanced surveillance performance, together with related safety enhancement efforts.

1. INTRODUCTION

1.1 The 20th Regional Airspace Safety Monitoring Advisory Group (RASMAG/20, 26–29 May 2015, Bangkok) concluded that safety concerns existed in relation to the provision of air traffic services on A593 ATS route within the Incheon FIR by Fukuoka, Incheon, and Shanghai ACCs, and the area was accordingly designated as Hot Spot B. Subsequently, the 11th Meeting of the Monitoring Agency Working Group (MAWG/11, 29 January – 1 February 2024, Bangkok) established procedures for subdividing Hot Spots, which were reviewed and approved at the 29th RASMAG (19 – 22 August 2024, Bangkok).

1.2 At that meeting, Hot Spot B on A593 ATS route was subdivided into B1 (transfer of control point between Incheon and Shanghai ACCs), B2 (intersection segment controlled by Incheon ACC), and B3 (boundary between Incheon and Fukuoka FIRs). Since no LHD occurrences were reported in B2 and B3, their designations were removed and only B1 remains designated.

1.3 The removal of B2 and B3 resulted from the implementation of Phase 1 of the “Consensus Document on the Phased Implementation of New Route Structure and Air Traffic Service Scheme” (hereinafter referred to as the “Phased Implementation Plan”) on 25 December 2020, which was concluded among the Republic of Korea, China, and Japan under the auspices of the ICAO Council. Pursuant to this Phased Implementation Plan, the Republic of Korea and Japan completed the duplication of A593 ATS route and the establishment of AIDC, and since 25 March 2021, Incheon ACC has been safely providing air traffic services for the east of SADLI of A593 (east of 125°E). However, implementation of the detailed measures for the west of SADLI under the Phased Implementation Plan have not yet been commenced, and LHD occurrences attributable to human error continue to be reported around SADLI (Hot Spot B1).

1.4 In this context, the Republic of Korea conducted a Safety Review to systematically analyze and manage the safety risk associated with Hot Spot B1. This paper proposes safety enhancement measures based on the results of the safety review.

2. DISCUSSION

Measures to Enhance Safety in Hot Spot B1

2.1 **Safety Review** - The Safety Review of Hot Spot B1 was conducted based on LHD data collected from January to December 2025, as well as mandatory and voluntary safety reports. Out of 91 safety data entries, 9 cases were excluded from the analysis due to misreporting or insufficient information. Accordingly, 82 cases were subject to a detailed safety review.

2.2 The safety review identified that 77 cases were attributable to errors by air traffic controllers, including uncoordinated flight level changes (40 cases), delayed provision of flight information (13 cases), and omission of flight information (8 cases). In addition, 3 cases were attributed to human errors by pilot, such as incorrect readback. One case of severe turbulence and one case of aircraft system malfunction were also reported. The risk assessment indicated that none of the cases were classified as “Severe” or “Major”. However, 55 cases were categorized as “Minor” and required mitigation measures, all of which were attributable to human errors. Although these cases do not pose an immediate significant safety risk, they highlight the potential for recurring human errors.

Note – In accordance with the Safety Manual (ATMO Directive), risk levels are classified as ‘Severe’, ‘Major’, ‘Minor’, and ‘Negligible’. ‘Severe’ is not acceptable. ‘Major’ is acceptable only after investigation and mitigation measures are implemented. ‘Minor’ is acceptable following expert review and the implementation of mitigation measures, without requiring a full investigation. ‘Negligible’ is acceptable without mitigation.

2.3 **Establishment and operation of AIDC** – As confirmed in previous meetings, the most fundamental and effective measure to mitigate human errors during the transfer of control is the establishment and operation of AIDC. Conclusion 26/33 of the 26th APANPIRG (7–10 September 2015, Bangkok), and the Asia/Pacific Seamless ANS Plan recognize the importance of AIDC as a mitigation measure against hazards caused by human errors. Furthermore, the 29th RASMAG (14–17 July 2024, Bangkok) acknowledged the establishment and operation of AIDC between Incheon ACC and Fukuoka ACC as an effective LHD mitigation measure, resulting in the removal of Hot Spots B2 and B3.

2.4 Taking these findings into consideration, the Republic of Korea completed the development of the necessary infrastructure at Incheon ACC for AIDC implementation (June 2023) and requested Shanghai ACC to commence trial operations in order to enhance safety on A593. However, China indicated in previous meetings that technical constraints made it difficult to proceed with trial operations. In response, the Republic of Korea clarified that its AIDC system can accommodate various technical requirements. The Republic of Korea stands ready to discuss trial operations with Shanghai ACC to resolve technical issues and to facilitate the implementation of AIDC between the two ACCs at the earliest possible opportunity.

2.5 **Safety Management Cooperation** – The Republic of Korea’s Air Traffic Management Office (ATMO) as the Air Navigation Service Provider (ANSP) is responsible for providing safe and efficient air traffic services within the Incheon FIR, and the Korea Office of Civil Aviation as the regulatory authority is responsible for conducting oversight of its ANSP accordingly. However, safety data related to the airspace delegated to Shanghai ACC (lateral: 25 NM on both sides of LAMEN–SADLI segment; vertical: FL250, FL290, FL310, FL390) are shared only to a limited extent, with such exchanges largely confined to LHD data, posing challenges to conducting comprehensive safety reviews and safety oversight.

2.6 In accordance with Action Item 29/2 of the 29th RASMAG (19 – 22 August 2024, Bangkok), since March 2025, the LHD information exchange interval between China RMA and ATMO has been reduced to two weeks, contributing positively to the analysis of LHD occurrences and hazard mitigation in the designated airspace. However, the current scope of information sharing, which is largely limited to LHD events, does not provide sufficient basis for safety assessment and oversight of the delegated airspace in line with ICAO standards.

2.7 The Republic of Korea has the responsibility to ensure continuous and effective safety management in the delegated airspace. Accordingly, as the State responsible for the Incheon FIR, the Republic of Korea requests the establishment of a safety oversight mechanism for the delegated airspace (LAMEN–SADLI segment of A593). This will contribute not only to strengthening bilateral aviation safety cooperation but also to enhancing airspace safety in the Asia/Pacific Region.

Improvement of the Airspace Environment

2.8 At the 13th Meeting of the ATM Sub-Group (ATMSG/13, 25 – 29 August 2025, Singapore), the Republic of Korea and China respectively presented measures to enhance safety on A593 ATS route. Following discussion, both States agreed to continue their coordination efforts and to submit a joint working paper to ATM/SG/14, scheduled for August 2026, providing an update on the progress of Phase 2 implementation and any associated operational outcomes.

2.9 Both States noted the need to improve the airspace structure. Currently, aircraft entering from the Shanghai FIR proceed to SADLI or NIRAT for departures from Pudong Airport Runway 34, or IKEDO, before joining the ATS route. Such operations, where aircraft join at specific fixes rather than along structured ATS routes, may create difficulties for controllers in aircraft identification and maintaining situational awareness. In 2024, an TCAS RA occurrence was reported in relation to these operations, highlighting associated safety concerns.



Figure 1. ATS Route Structure for Phase 1

2.10 Controllers' situational awareness is enhanced when ATS route structures accurately reflect actual traffic flows. In this regard, the Phased Implementation Plan was developed to align route design with prevailing operational conditions. However, further improvements are required in the Hot Spot B1 area. It is therefore proposed that Phase 2 of the Phased Implementation Plan be implemented at the earliest opportunity, including the establishment of a triple ATS route structure on A593, as agreed by ICAO, the Republic of Korea, China, and Japan.

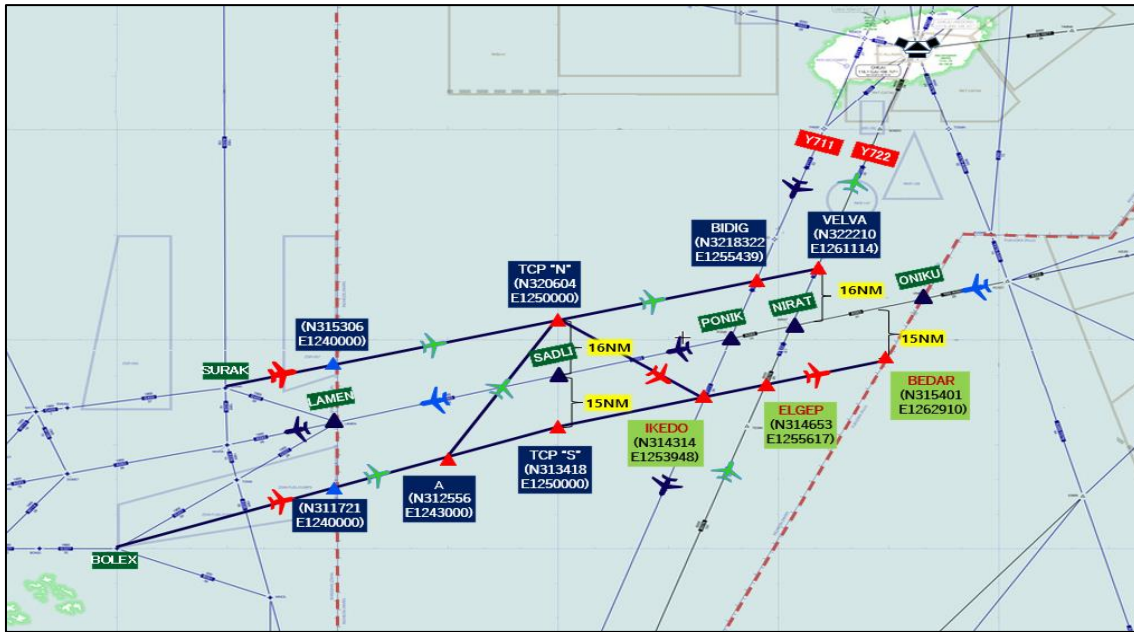


Figure 2. ATS Route Structure for Phase 2

Efforts to Enhance Airspace Safety

2.11 In 2025, the average daily traffic in the Incheon FIR was 2,778 movements per day, exceeding the pre-pandemic level of 2019 (2,307 movements per day). To accommodate increasing traffic demand and maintain airspace capacity and smooth traffic flow, the Republic of Korea will require ADS-B equipage for all transport aircraft operating within the Incheon FIR from 9 April 2027. As a result, surveillance within the Incheon FIR will transition from radar-only surveillance to integrated ADS-B surveillance environment, thereby enhancing the stability of surveillance services.

2.12 However, despite the enhanced surveillance capability, a 10-minute longitudinal separation minimum is still applied to aircraft departing from the Incheon FIR to Shanghai ACC via A593 on the same flight level, which limits improvements in operational efficiency.

2.13 ICAO AN-Conf/14 Recommendation 3.3/1 (26 August – 6 September 2024, Montreal) recommends the implementation of longitudinal separation minima of 30 NM or less in oceanic and remote airspace, and 10 NM or less in other airspace. In this regard, the APANPIRG/36 (24–26 November 2025, Bangkok) adopted Decision APANPIRG/36/7 to establish the APAC Project 30/10 Task Force, which held its first meeting from 16 to 18 June 2026 in Tangerang, Indonesia.

2.14 Considering the enhanced surveillance capability along the entire A593 route, the Republic of Korea is ready to discuss the reduction of longitudinal separation minima with Fukuoka and Shanghai ACCs in accordance with Recommendation 3.3/1 of AN-Conf/14. In preparation for Phase 2 operations under the Phased Implementation Plan, the Republic of Korea is also preparing the design of a triple ATS route structure, the removal of FLAS, and the improvement of flight information procedures for VFR aircraft.

2.15 Furthermore, following up on ATM/SG/13 (25 – 29 August 2025, Singapore), the Republic of Korea has proposed bilateral meetings with China to discuss safety enhancement measures for the B1 segment, but no concrete progress has been made yet.

Operational Structure and Terminology of A593 ATS Route

2.16 As noted in paragraph 1.3, following the signing of the Phased Implementation Plan on 25 December 2020 among the Republic of Korea, China, Japan, and ICAO, the corridor system applied to the ONIKU–LAMEN segment of A593 within the Incheon FIR (formerly known as the FUKUE–AKARA Corridor) was dismantled upon the implementation of Phase 1 on 25 March 2021. Accordingly, Incheon ACC has been providing air traffic services for the SADLI–ONIKU segment (east of 125°E), while Shanghai ACC has been providing services for the SADLI–LAMEN segment (west of 125°E) under delegation from Incheon ACC. Therefore, the term “Corridor” or “AKARA Corridor” is no longer valid, and it is proposed that “A593 delegated airspace” or “SADLI–LAMEN segment” be used instead.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) encourage China and the Republic of Korea to implement Phase 2 of the “Phased Implementation Plan” including the implementation of triple routes, AIDC and separation minima reduction at the earliest possible opportunity;
- c) encourage China and the Republic of Korea to discuss the establishment of an appropriate safety oversight mechanism to enhance airspace capacity, operational efficiency, and safety; and
- d) discuss any relevant matters as appropriate.

— END —