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ICAO

**Thirtieth Meeting of the Regional Airspace Safety Monitoring
Advisory Group (RASMAG/30)**

Bangkok, Thailand, 14 – 17 July 2025

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

**SHARING THE IMPLEMENTATION STATUS OF SAFETY IMPROVEMENT MEASURES
AT HOT SPOT B1 ON A593 AND FUTURE TASKS**

(Presented by the Republic of Korea)

SUMMARY

This paper aims to share the status of Large Height Deviation (LHD) occurrences at Hot Spot B1 on A593 within Incheon Flight Information Region, and propose measures to reduce LHD and improve safety in the SADLI-LAMEN segment of A593. Considering that LHD occurrences observed in Hot Spot B1 are mostly caused by human errors, to reduce LHDs, we would like to propose the rapid implementation of the Second Phase of A593 Normalization, which includes the implementation of Air Traffic Services Inter-Facility Data Communication (AIDC) between Incheon ACC and Shanghai ACC and triple ATS routes.

1. INTRODUCTION

1.1 Hot Spot B of the Asia-Pacific region situated between ONIKU-LAMEN of A593 within Incheon Flight Information Region (FIR) was established at the RASMAG/20 (May 26-29, 2015) due to potential safety concerns over the provision of air traffic services by different States – Korea, China and Japan. Afterwards, under the leadership of the ICAO Council, China, Japan, Republic of Korea and ICAO held a special meeting on October 2018, agreed on the phased implementation of A593 normalization on 25 December 2020, and initiated the phase 1 of the normalization on 25 March 2021.

1.2 Accordingly, the Republic of Korea established Y590, a route parallel to SADLI-ONIKU of A593 and implemented ATS inter-facility data communication (AIDC) between Incheon ACC and Fukuoka ACC. With these efforts, despite increased traffic between Incheon ACC and Fukuoka ACC, there has been no LHD reported over the past 3 years. On the other hand, the extension of Y590 and the implementation of AIDC for LAMEN-SALDI segment of A593 which is delegated to China has been delayed due to differences of opinion between the Republic of Korea and China, which has contributed to ongoing LHD occurrences (Table 1).

Table 1. LHD Occurrences on A593

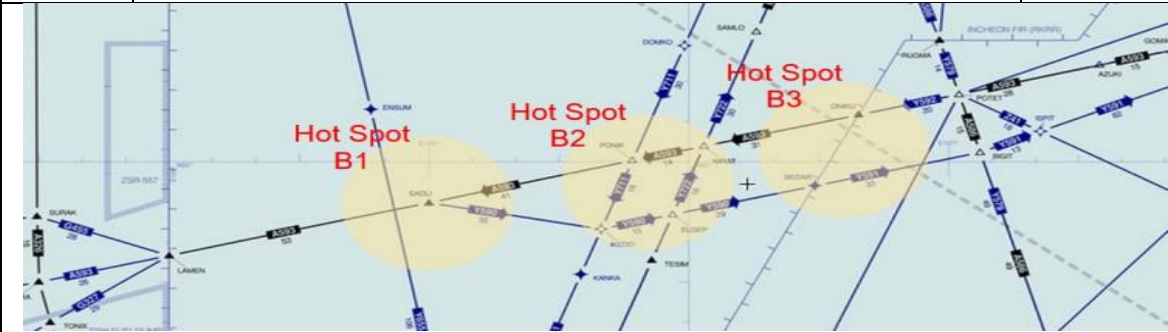
Interface	2021	2022	2023	2024
Between Incheon ACC and Fukuoka ACC	0	0	0	-
Between Incheon ACC and Shanghai ACC	21	108	74	123

1.3 LHDs are primarily caused by human errors (Category “E”), including flight information errors, uncoordinated altitude changes and missing flight information notification. As air traffic continues to increase after the end of the COVID-19 pandemic, LHDs are expected to persist unless operational environment within SADLI-LAMEN segment is improved through AIDC and multiple route implementation, raising concerns over the potential for serious aviation safety incidents.

1.4 The 11th meeting of MAWG ('24.1.29~2.1, Bangkok, Thailand) established the ‘Hot Spot Management Process’ to identify, monitor, and release hot spots in the Asia-Pacific region, and the 29th meeting of RASMAG ('24. 8.19~8.22, Bangkok, Thailand) reviewed and approved it. Accordingly, Hot Spot B in A593 was subdivided into B1 (control transfer point between Incheon and Shanghai ACC), B2 (air route intersection controlled by Incheon ACC) and B3 (control transfer point between Incheon and Fukuoka ACC). However, B2 and B3 where there has been no LHD occurrence were delisted, and only B1 remains on the list (Table2).

Table 2. LHD Hot Spot B

Name	Involved FIR	Hot Spot
B1	INCHEON (TOC point of Incheon ACC and Shanghai ACC)	Continued
B2	INCHEON (Intersection of A593, Y590, Y711 and Y722)	Deleted
B3	INCHEON and FUKUOKA	Deleted



1.5 This paper aims to share the efforts made by the Republic of Korea and China to implement Action Item 29/2 of the 29th RASMAG meeting and propose measures to improve airspace safety to remove B1 from the Hot Spot list.

2. DISCUSSION

LHD Information Exchange

2.1 The Republic of Korea has implemented follow-up measures to improve safety at Hot Spot B1 in accordance with Action Item 29/2 of the 29th RASMAG meeting and has conducted various technical reviews to reduce human errors by air traffic controllers.

2.2 First of all, the 10th Republic of Korea(ATMO)-China(ATMB) ATM/CNS Coordination Meeting ('24.9.9 ~9.12, Shanghai, China) was convened to discuss ways to improve LHD data sharing process between Incheon and Shanghai ACCs, implement AIDC and achieve structural improvement of the air route between Korea (Incheon FIR) and China (Shanghai FIR), aiming to reduce LHDs occurring in Hot Spot B1 and conduct accurate situation analysis on the cause of the occurrences.

2.3 During the meeting, the Republic of Korea proposed to use MAAR's online reporting platform or increase the frequency of information exchange to no less than twice a month as suggested by RASMAG/29 in order to improve the LHD information exchange process. China stated that it is unable to utilize the platform due to internal issues, and agreed to explore improvement by shortening the exchange cycle. In addition, Korea also suggested to share safety information including analyzed LHD cases through various bilateral meetings between two States.

2.4 After the meeting, the Republic of Korea and China have continued joint work to improve the LHD information exchange process and agreed to exchange LHD occurrences twice a month between the Air Traffic Management Office (ATMO) of Korea and China RMA, and deliver mutually confirmed LHDs to PARMO. This measure has been in effect since April of this year.

AIDC implementation

2.5 In an effort to mitigate human error, Korea completed the construction of AIDC infrastructure in June 2023, and requested a test-operation with China. However, China mentioned that they found it difficult because of technical issues and the need for regulatory approval.

2.6 Air traffic volume on A593 dropped sharply after the outbreak of the pandemic, but it began recovering rapidly since 2023, reaching 93% of its 2019 level in 2024. And this year, air traffic is predicted to surpass the 2019 volume (**Table 3**). Based on this, if there is no improvement in the flight information notification procedure, the workload of air traffic controllers will significantly increase, and accordingly the possibility of LHD occurrences and aviation safety occurrences of human error is expected to rise.

Table 3. Traffic volumes on A593 (2019~2024)

Year	2019	2020	2021	2022	2023	2024	2025.1~5.
Total	358,052	125,940	109,356	131,400	268,363	335,490	150,125
Daily (average)	981	344	300	360	735	971	994
Compared by 2019	-	35%	31%	37%	75%	93%	101%

2.7 In addition to the implementation of AIDC, the Republic of Korea has continued to conduct research on various system improvements in order to prevent human errors and improve airspace safety. In particular, the Republic of Korea completed the project to develop and expand the use of ADS-B surveillance data, enabling Incheon ACC to recognize aircraft information coming from Shanghai ACC in advance, thereby reducing the possibility of incidents caused by delayed or missing flight information notification, and providing safer air traffic control services at Hot Spot B1.

2.8 However, there are concerns that aircraft's position provided by ADS-B may be displayed inaccurately in the event of GNSS interference. In addition, air traffic controllers of Incheon ACC do not know instructions issued by Shanghai ACC before receiving transfer information from Shanghai ACC. Therefore, ADS-B information is being used as supplementary ones for providing air traffic services. In these reasons, Incheon and Shanghai ACCs need for rapid AIDC implementation for fundamental improvement of aviation safety within the delegated airspace. Meanwhile, it has been confirmed that the AIDC system of the Republic of Korea is compatible with various technical requirements.

Implementation of the 2nd Phase of A593 Normalization

2.9 To significantly reduce the occurrence of human errors within Hot Spot B1 at the fundamental level, the improvement of the ATC environment in the delegated airspace (LAMEN-SADLI segment of A593) is necessary. As this airspace has only one ATS route while the other side has two, it occurs bottleneck phenomena over SADLI when managing traffic bound for Shanghai.

2.10 In addition, the separation minima between aircraft from Incheon ACC to Shanghai ACC is 10 minutes (50~60NM) longitudinally, which is much greater than other airspaces where surveillance services are provided, causing congestion within the Incheon ACC and posing a safety risk. During the 14th Air Navigation Conference (AN Conf/14, 26 Aug – 6 Sep 2024), the Conference agreed to implement Project 30/10 – implementation of longitudinal separations of 30NM or less in oceanic and remote airspace and 10NM or less elsewhere (Recommendation 3.1/1).

2.11 To resolve these issues, the discussion on the implementation of the 2nd phase of A593 normalization that has been suspended must be resumed promptly.

3. ACTION BY THE MEETING

- 3.1 The meeting is invited to
- a) note the information contained in this paper;
 - b) encourage China and Republic of Korea to discuss the implementation of AIDC and the reduction of longitudinal separation between Shanghai ACC and Incheon ACC to reduce LHD occurrence at Hotspot B1;
 - c) support ICAO, China and Republic of Korea to discuss the implementation of the 2nd Phase of A593 Normalization to enhance the safety of Hotspot B1; and
 - d) discuss any relevant matters as appropriate.

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