



ICAO

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

Bangkok, Thailand, 14 – 17 July 2025

Agenda Item 3: Reports from Asia/Pacific RMAs and EMAs

**2024 ANALYSES FOR THE TRANSFER OF CONTROL POINT BETWEEN INCHEON FIR
AND SHANGHAI FIR, HOT SPOT B1**

(Presented by the United States/PARMO)

SUMMARY

The Incheon FIR AKARA Corridor interface with Shanghai/Fukuoka/Taipei FIRs was identified in 2015 by RASMAG/20 as one of the LHD Hot Spot Areas (Hot Spot B) with the PARMO, China RMA, JASMA, MAAR as the RMAs assigned to this task. This paper presents analyses of the Hot Spot, B1, transfer of control point between Incheon ACC and Shanghai ACC.

1. INTRODUCTION

1.1 The PARMO presented WP04 to RASMAG/29, which contained analyses of the AKARA corridor airspace for calendar years 2015 through 2024. RASMAG/29 agreed to the sub-divisions of Hot Spot B proposed by the RASMAG Monitoring Agencies Working Group (RASMAG/MAWG).

1.2 The AKARA corridor airspace refers to the airspace involving four FIRs, specifically Fukuoka, Incheon, Taipei and Shanghai. Phase 1 of the improvement plan for the AKARA Corridor was implemented on 25 March 2021. Phase 1 included a new eastbound unidirectional ATS route, Y590/Y591, parallel to airway A593.

1.3 The Hot Spot Identification process was developed at the Ninth Meeting of the RASMAG Monitoring Agencies Working Group (RASMAG/MAWG/9). The RASMAG/29 meeting agreed to split Hot Spot B into smaller areas at the interface level.

1.4 The Hot Spot B was divided into three smaller areas as follows (**Figure 1**):

- a) B1 for Incheon (Transfer-of-control Point between Incheon ACC and Shanghai ACC);
- b) B2 for Incheon (Intersection points of A593, Y590, Y711 and Y722;
- c) B3 for Fukuoka and Incheon

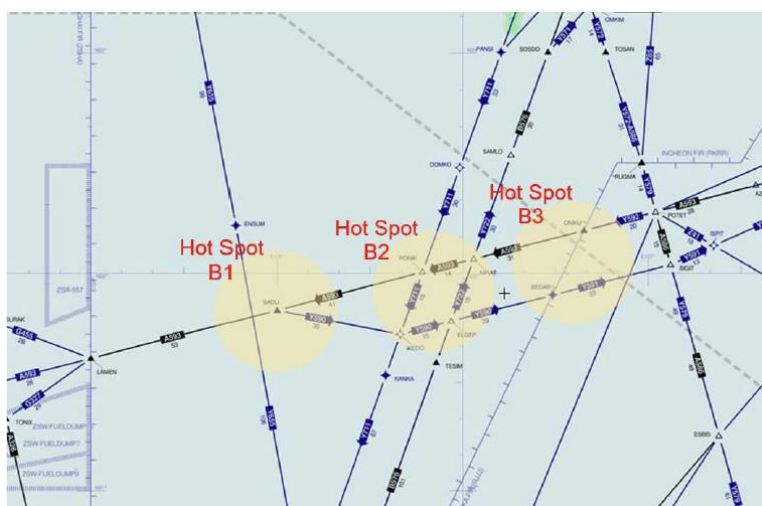


Figure 1. Subdivisions for Hot Spot B

- 1.5 RASMAG/29 agreed to remove Hot Spot B2 and B3 from the Hot Spot list.
- 1.6 This working paper provides the meeting with an update related to Hot Spot B1.

2. DISCUSSION

2.1 The reported LHDs for AKARA Corridor Airspace collected by the China RMA and PARMO were compiled and assessed. A summary of the reported LHDs for calendar year 2024 is shown in **Figure 1**. There were 123 LHDs reported for calendar year 2024 representing a 66% increase in the overall number of reported LHDs compared to calendar year 2023 (74 reported occurrences in 2023 vs 123 occurrences reported in 2024).

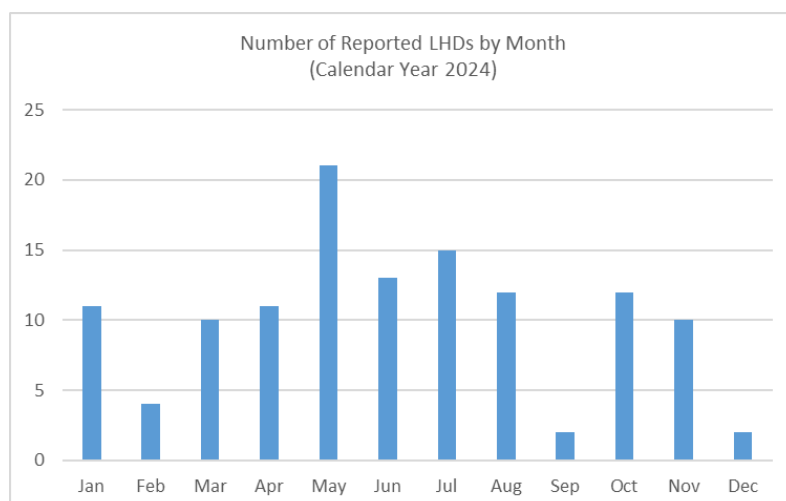


Figure 1. Number of reported LHDs for the AKARA Corridor by Month for 2024

2.2 A comparison from recent years is shown in **Figure 2**. Most of the reported LHDs involved errors in ATC transitions and were attributed to LHD category E - Coordination errors in ATC-to-ATC transfer of control responsibility due to human factors issues.

2.3 All reported LHDs were identified by the receiving ATC-unit prior to the aircraft entering their airspace, as a result all reported LHD occurrences are categorized as non-risk bearing. This means that all reported LHDs have zero duration and do not affect the operational vertical collision risk estimates.

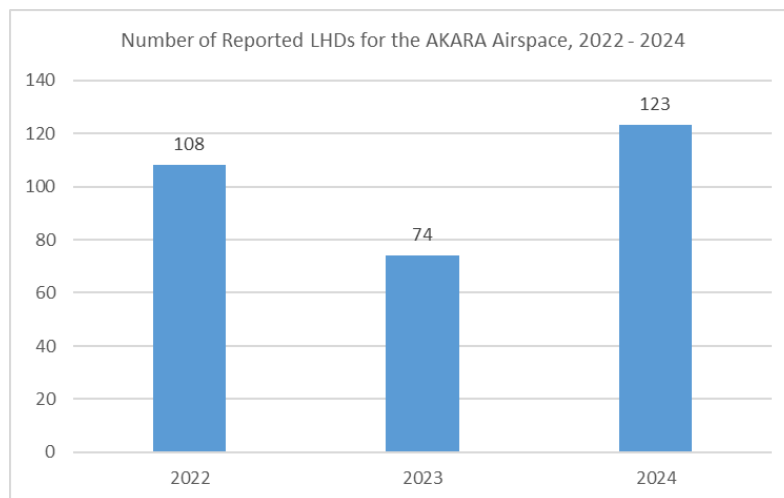


Figure 2. Number of reported LHDs for the AKARA airspace during the period of 2022-2024

2.4 The MAWG/12 discussed the sub-categories for LHD category E occurrences and decided on the following set:

- E-NT: No Transfer or Negative Transfer,
- E-LT: Late Transfer,
- E-RI: No or Late Revision of Transfer Information, and
- E-OT: Any Other Types.

2.5 The data in Figure 3 show a comparison of the LHD Category E by sub-category.

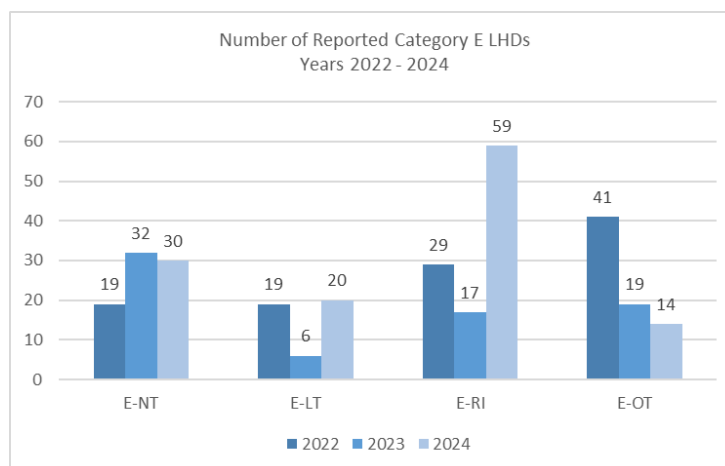


Figure 3. Comparison of Category E LHDs by sub-category, 2022-2024

2.6 The data for calendar year 2024 show that most of the reported category E LHDs involved no or late revision to the transfer information.

2.7 **Figure 4** shows the number of LHDs reported by Airspace Fix for calendar years 2022 through 2024. The data show a higher number of reported LHDs near SADLI.

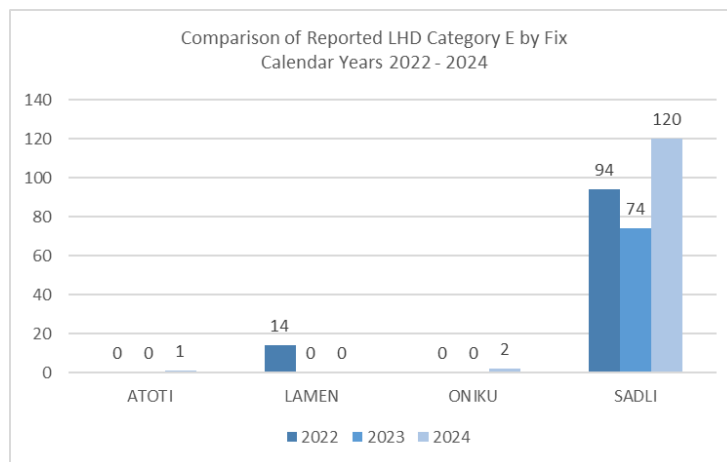


Figure 4. Comparison of Category E LHDs by location, 2022-2024

2.8 **Figure 5** provides the geographic location of LHD reports during the calendar year 2024. There were 120 reports at the SADLI fix location, 2 reports at the ONIKU fix and 1 report at the ATOTI fix. All reported LHDs indicated risk was mitigated by available surveillance and direct speech circuit, or other means.

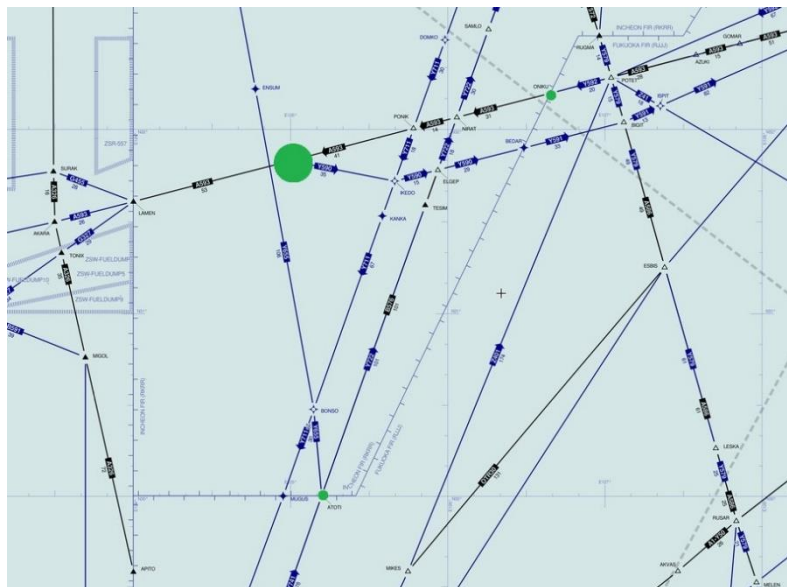


Figure 5. Geographical locations of Category E LHDs -2024

Vertical Risk Estimate

2.9 None of the reported LHDs in calendar year 2024 contribute towards the estimate of operational vertical risk. Therefore, the vertical operational risk estimate is zero for calendar year 2024. The vertical technical risk 0.56×10^{-9} fapfh.

2.10 **Figure 6** shows the twelve-month rolling vertical collision risk estimates for AKARA airspace for 2017 through 2024.

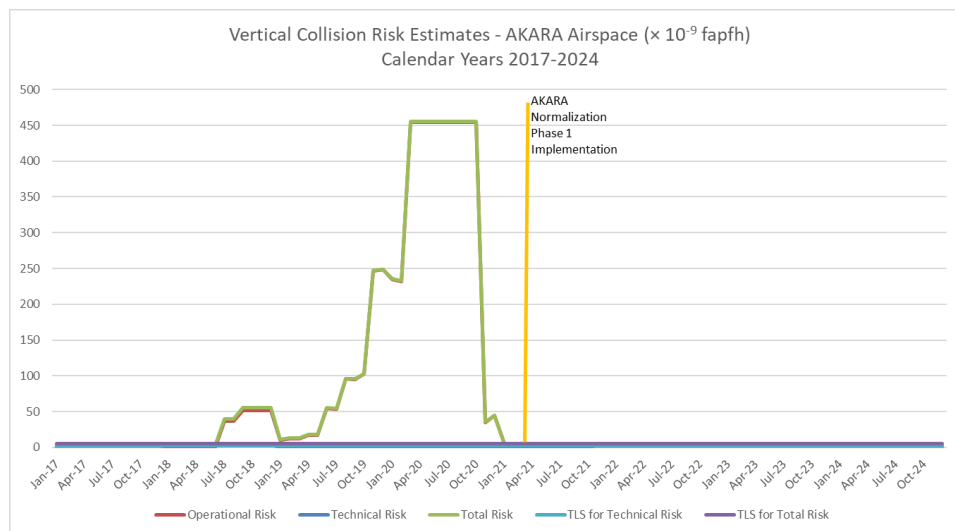


Figure 6. Vertical Collision Risk Estimates, 2017-2024

Hot Spot Identification Process

2.11 The Hot Spot Identification process is applied to Hot Spot B1. This process was developed at the Ninth Meeting of the RASMAG Monitoring Agencies Working Group (RASMAG/MAWG/9). The results from 2022 through 2024 are provided in **Table 1**.

2.12 The first row of Table 1 contains the numbers of reported LHDs. A '[0]' is below the number of reported LHDs indicating all the reported LHDs were mitigated with no contribution towards vertical collision risk estimates.

2.13 The second row of Table 1 contains the numbers of observed clusters. The third row of Table 1 contains the operational risk estimate for Hot Spot B1 for each calendar year.

Table 3. Hot Spot Identification Process for Hot Spot B1

	2022	2023	2024
Number of LHDs in Hot Spot B1 ¹	108	74	123
	[0]	[0]	[0]
Number of Clusters (n) in Hot Spot B1	11	1	1
Hot Spot B Operational Risk ($\times 10^{-9}$ fapfh)	0.0	0.0	0.0
Criteria: Number of Occurrences in Hot Spot B1/(n+1)	54	37	61.5
	[0]	[0]	[0]
Criteria: Region Risk Estimate ($\times 10^{-9}$ fapfh)/(n+1)	0	0	0
Criteria: TLS $\geq 5 \times 10^{-9}$ fapfh	5	5	5
Result and Action by RASMAG Meeting	Continue Monitoring (RASMAG/28)	Continue Monitoring Hot Spot B1 (RASMAG/29)	Continue Monitoring Hot Spot B1 (RASMAG/30)

¹ RASMAG/29 defined Hot Spot B1 as the Transfer-of-control Point between Incheon ACC and Shanghai ACC

2.14 For RASMAG to remove an LHD hot spot, proof of mitigation measures should be presented, and the implementation results should reflect the effectiveness of risk controls in terms of reduction in the number of occurrences and operational risk of the hot spot.

2.15 The first row of Table 1 provides the counts of reported LHDs for Hot Spot B1. For calendar years 2022 through 2024, all the reported LHDs involved ATC coordination errors and all these occurrences were mitigated with surveillance, direct speech circuit or other means. The [0] below the number of LHD reports received means that none of the LHD reports contributed towards the vertical risk estimate.

2.16 The process to provide the LHD reports to the adjacent ATC-unit has improved since RASMAG/29. The LHD data collected towards the end of calendar year 2024 represents a hybrid from the old and new processes. It is expected that the 2025 analysis shows improvement in the number of confirmed LHD reports.

2.17 The PARMO understands the new process for sharing reported LHD information is much improved compared to the previous process. From the PARMO's perspective, the newer process is more efficient and should assist in enhancing airspace safety. The previous process required LHD reports to be relayed via the designated RMAs. Due to the delays associated with the previous process, data retention would often expire before the adjacent ATC-unit could confirm the report but more importantly, data retention expiration limited the investigation of underlying causal factors.

2.18 The PARMO thanks the Republic of Korea and China RMA for providing the needed data used in this analysis.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) consider the results of the Hot Spot identification process; and
- c) invite States involved with Hot Spot B1 to comment on changes to LHD reporting process; and
- d) discuss any relevant matters as appropriate.

— END —