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Advisory Group (RASMAG/30)**

Bangkok, Thailand, 14 – 17 July 2025

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

RVSM RISK ASSESSMENT IN THE JAKARTA AND UJUNG PANDANG FLIGHT INFORMATION REGION

1 JANUARY 2024 TO 31 DECEMBER 2024

(Presented by Australian Airspace Monitoring Agency)

SUMMARY

This paper presents an airspace Safety Review of RVSM airspace risk in the Indonesian Flight Information Regions (FIR) for the period 1 January 2024 to 31 December 2024. Results show a technical risk of 0.13×10^{-9} , an operational risk of 2.12×10^{-9} and a total risk of 2.25×10^{-9} . The technical risk is below the Target Level of Safety (TLS) of 2.5×10^{-9} fatal accidents per flight hour (fapfh), and the total risk is below the relevant TLS (5.0×10^{-9} fapfh). A brief quantitative assessment of the safety reporting culture is also conducted.

1. INTRODUCTION

1.1 This report provides an airspace Safety Review of RVSM airspace risk in the Jakarta and Ujung Pandang FIRs for the period 1 January 2024 to 31 December 2024. The review is undertaken using a 12-month data sample period and is based on data supplied from Air Nav Indonesia.

1.2 All airspace safety estimates and TLS values in this report are measured in terms of fatal accidents per flight hour (fapfh).

1.3 The estimated risk is compared to the TLS of no more than 2.5×10^{-9} for the technical component of the risk, and 5.0×10^{-9} for the total weighted risk.

1.4 The results indicate risk is below the TLS. The LHD presenting the most operational risk occurred on a two-way route and lasted 7 minutes in duration (and contributed 12% of the total operational risk). It involved an aircraft that was detected in ADS-B coverage some 70 NM north of the Brisbane-Ujung Pandang FIR boundary – it had not been coordinated by Brisbane FIR. Communication with the pilot proved difficult.

1.5 Approximately 83% of the operational risk was contributed by 51 LHDs involving coordination errors in the ATC-to-ATC transfer or control responsibility as a result of human factors issues (Category E). There were 30 additional LHDs falling into the same category; however, these presented no risk. The total number of Category E LHDs (81) is a decline from the previous year (103), with a commensurate decline in risk-bearing LHDs.

2. DISCUSSION

Data Sources

2.1 *Traffic Sample Data (TSD)*: TSD covering four weeks of the month of December 2024 of aircraft operating in the Jakarta and Ujung Pandang FIRs was used as required by ICAO Regional agreement.

2.2 *Large Height Deviations (LHDs)*: A cumulative 12-month data set of LHD reports was used, covering 1 January 2024 to 31 December 2024.

Summary of LHD Occurrences

2.3 The number of reported LHD occurrences, non-zero-duration LHDs, total LHD duration (in minutes), and total number of levels crossed for the period 1 January 2024 to 31 December 2024 are shown by month in **Table 1**. The number of reported LHDs, duration, and levels crossed are shown in **Figure 1**.

Table 1: Summary of LHD occurrences by month for the period 1 January 2024 to 31 December 2024. Results for 2023 are illustrated for comparison.

Month	Number of reported LHDs	Number of non-zero-duration LHDs	LHD duration (minutes)	Number of levels crossed
January	9	8	7.5	2.5
February	8	1	1	10
March	9	1	1	9
April	11	0	0	17.5
May	12	4	4	8
June	6	1	1	4.8
July	9	4	3.5	5
August	7	4	9.5	4.4
September	10	3	2.5	5.5
October	7	2	2	1.5
November	4	1	1	10
December	10	0	0	12.5
Total	102	29	33	90.7
Total 2023	125	45	91.0	124.0

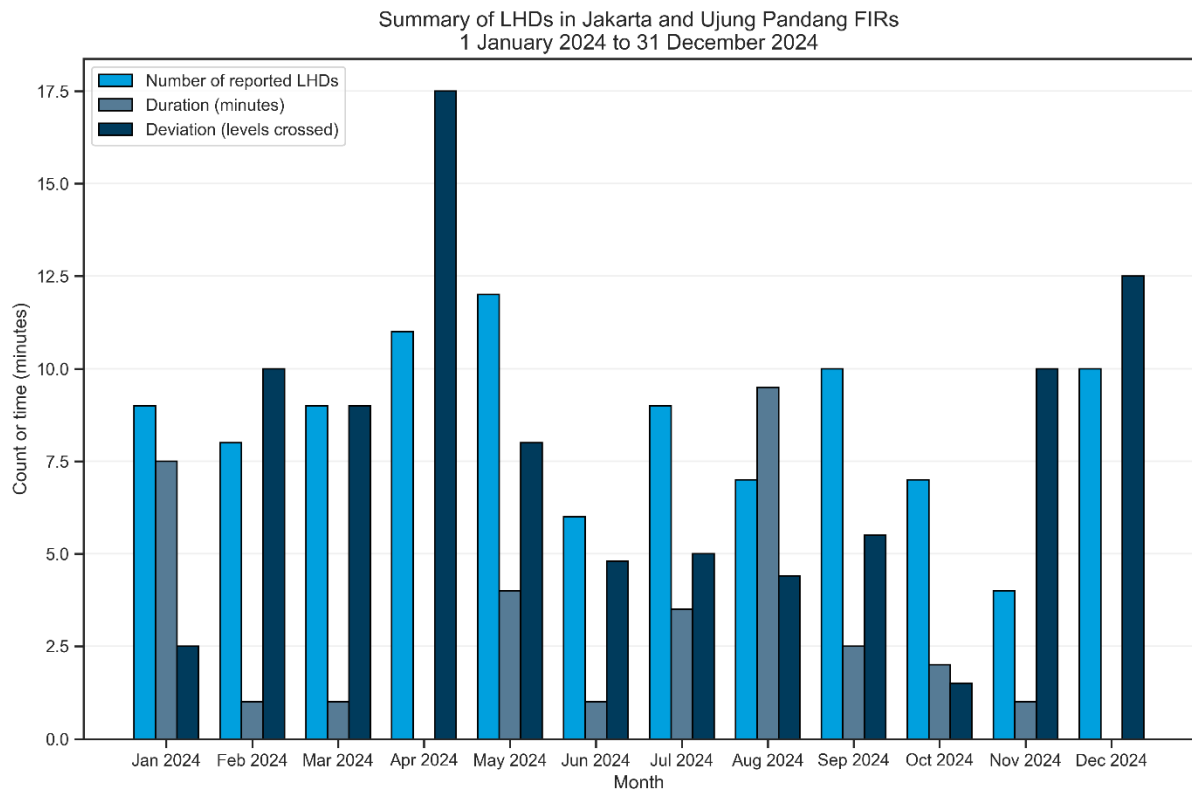


Figure 1: Number of LHDs, duration of LHDs, and number of levels crossed by month for the period 1 January 2024 to 31 December 2024.

2.4 The number of reported LHDs, total LHD duration (in minutes), and total number of levels crossed for the period 1 January 2024 to 31 December 2024 are shown by LHD category in **Table 2** and **Figure 2**.

Table 2: Summary of LHD occurrences by category for 1 January 2024 to 31 December 2024. Results for 2023 are also shown.

LHD category	LHD category description	2024			2023		
		Number LHDs	Duration of LHDs (minutes)	Number of levels crossed	Number LHDs	Duration of LHDs (minutes)	Number of levels crossed
A	Flight crew failing to climb/descend the aircraft as cleared	4	0	5	6	4.0	7.8
B	Flight crew climbing/descending without ATC clearance	13	4	11.4	6	9.5	6.9
C	Incorrect operation or interpretation of airborne equipment	1	0	4	1	26.0	0.0
D	ATC system loop error	2	0.5	1.5	2	1.5	2.3
E	Coordination errors in the ATC-to-ATC transfer or control responsibility as a result of human factors issues	81	27.5	68.8	103	42.0	105.0

LHD category	LHD category description	2024			2023		
		Number LHDs	Duration of LHDs (minutes)	Number of levels crossed	Number LHDs	Duration of LHDs (minutes)	Number of levels crossed
F	Coordination errors in the ATC-to-ATC transfer or control responsibility as a result of equipment outage or technical issues	1	1	0	6	7.0	0.0
G	Deviation due to aircraft contingency event leading to sudden inability to maintain assigned flight level	0	0	0	0	0	0
H	Deviation due to airborne equipment failure leading to unintentional or undetected change of flight level	0	0	0	0	0	0
I	Deviation due to turbulence or other weather-related cause	0	0	0	0	0	0
J	Deviation due to TCAS resolution advisory; flight crew correctly following the resolution advisory	0	0	0	1	1.0	2.0
K	Deviation due to TCAS resolution advisory; flight crew incorrectly following the resolution advisory	0	0	0	0	0	0
L	An aircraft being provided with RVSM separation is not RVSM approved	0	0	0	0	0	0
M	Other	0	0	0	0	0	0
Total		102	33	90.7	125	91	124

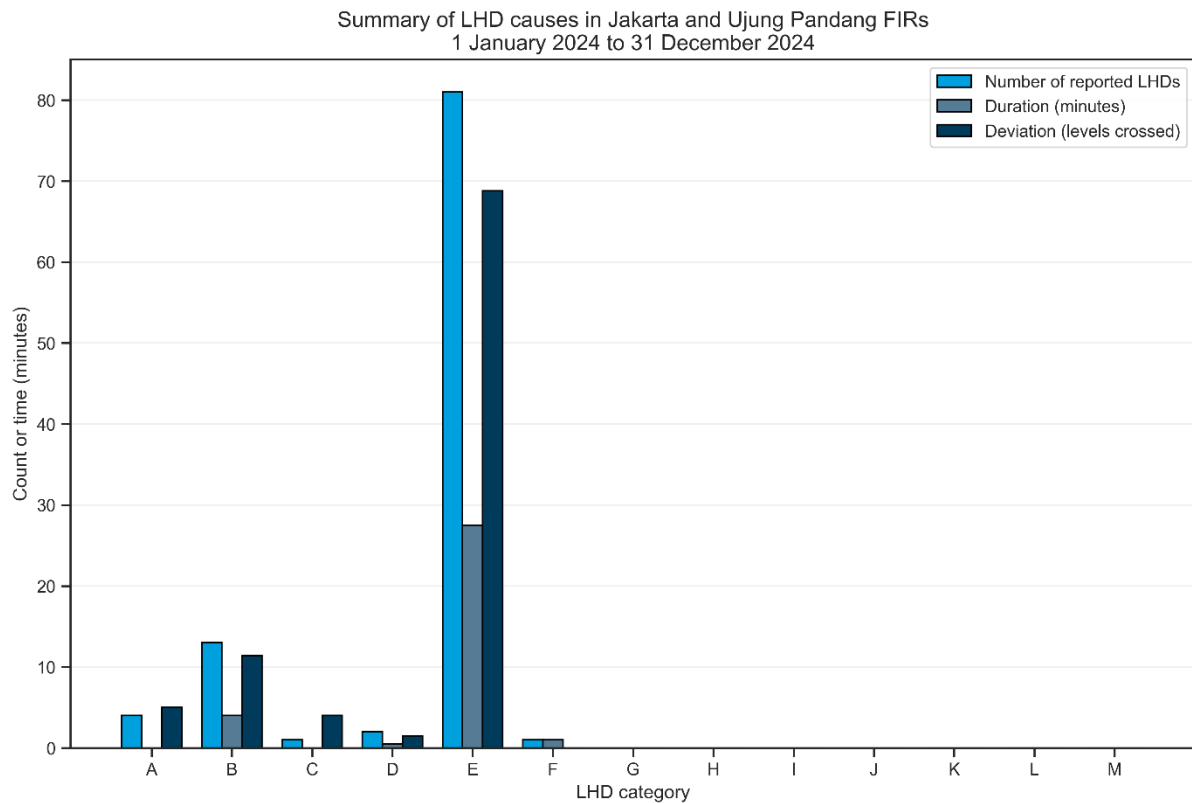


Figure 2: Number of LHDs, duration of LHDs, and number of levels crossed by LHD category for the period 1 January 2024 to 31 December 2024.

Collision Risk Estimate

2.5 The results for the technical, operational, and total risk for the RVSM implementation in the Indonesian FIR for 1 January 2024 to 31 December 2024 are detailed in **Table 3**. The technical risk meets the TLS value of no more than 2.5×10^{-9} . The weighted total risk exceeds the specified TLS value for these components of 5.0×10^{-9} .

Table 3: RVSM Risk Estimates for the period 1 January 2024 to 31 December 2024. The number of estimated annual flying hours is 548,638 based on the December 2024 TSD. Values for 2023 are included for reference.

Source of risk	Risk estimate 2024	Risk estimate 2023	TLS	Comparison with TLS
Technical risk	0.13×10^{-9}	0.12×10^{-9}	2.5×10^{-9}	Below technical TLS
Operational risk	2.12×10^{-9}	5.23×10^{-9}	-	-
Total risk	2.25×10^{-9}	5.35×10^{-9}	5.0×10^{-9}	Below total TLS

2.6 The trends of the technical risk, operational risk, and total risk for the period 1 January 2024 to 31 December 2024 are shown in **Figure 3**.

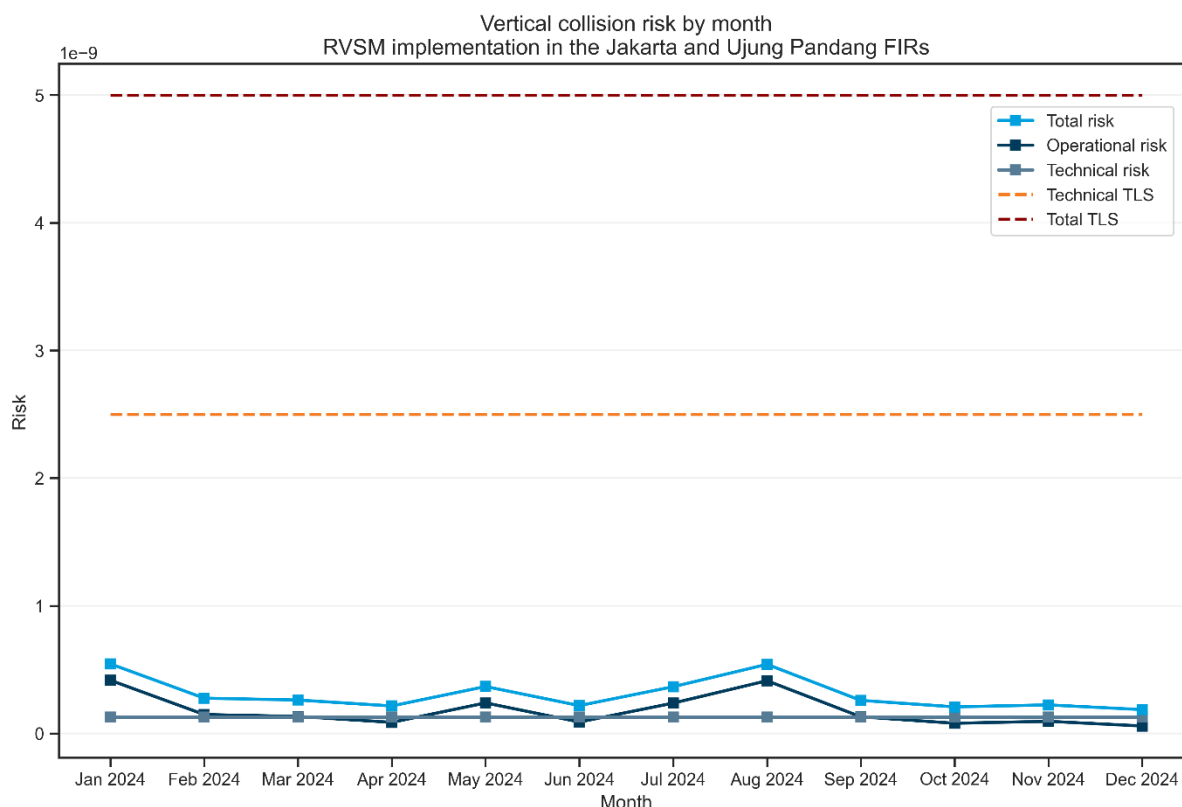


Figure 3: Trends of the technical, operational, and total risk for the period 1 January 2024 to 31 December 2024.

Assessment of Safety Reporting Culture

2.7 The 7th Meeting of the Monitoring Agencies Working Group (MAWG/7) proposed that Regional Monitoring Agencies (RMAs) assess States' reporting culture, since the RVSM risk assessment is dependent on the accuracy and quality of the LHD reports received.

2.8 MAWG/7 proposed that the reporting safety culture metric would be measured by the reporting rate of occurrence per flight hour, with occurrences grouped by attribution: Pilot/Aircrew (Categories A, B, and C), ATC (Categories D, E, and F), and others (Categories G, H, I, J, K, L, and M). The safety culture metric for Indonesia is shown in **Table 4**.

Table 4: Safety culture metric for Indonesia by LHD attribution for the period 1 January 2024 to 31 December 2024.

Attribution	Number of reports	Flight hours	Number of reports per flight hour (x 10 ⁻⁵)
Pilot/Aircrew (A, B, C)	18	548 638	3.3
ATC (D, E, F)	84	548 638	15.3
Other	0	548 638	0

2.9 Of the 81 Category E LHDs, 48 reports corresponded to errors made by neighbouring ATCs, and 33 reports corresponded to errors made by Jakarta or Ujung Pandang ATCs.

Geolocation of LHDs

2.10 A map identifying the geographic location of LHD occurrences for the period 1 January 2024 to 31 December 2024 is shown in **Figure 4**. (The relevant map for 2023 is shown in **Figure 5**.) The occurrences at each location are represented by a coloured circle, with the radius proportional to the total risk at that location. The map is intended to provide a means to identify and visualise risk hot spots related to RVSM operations.

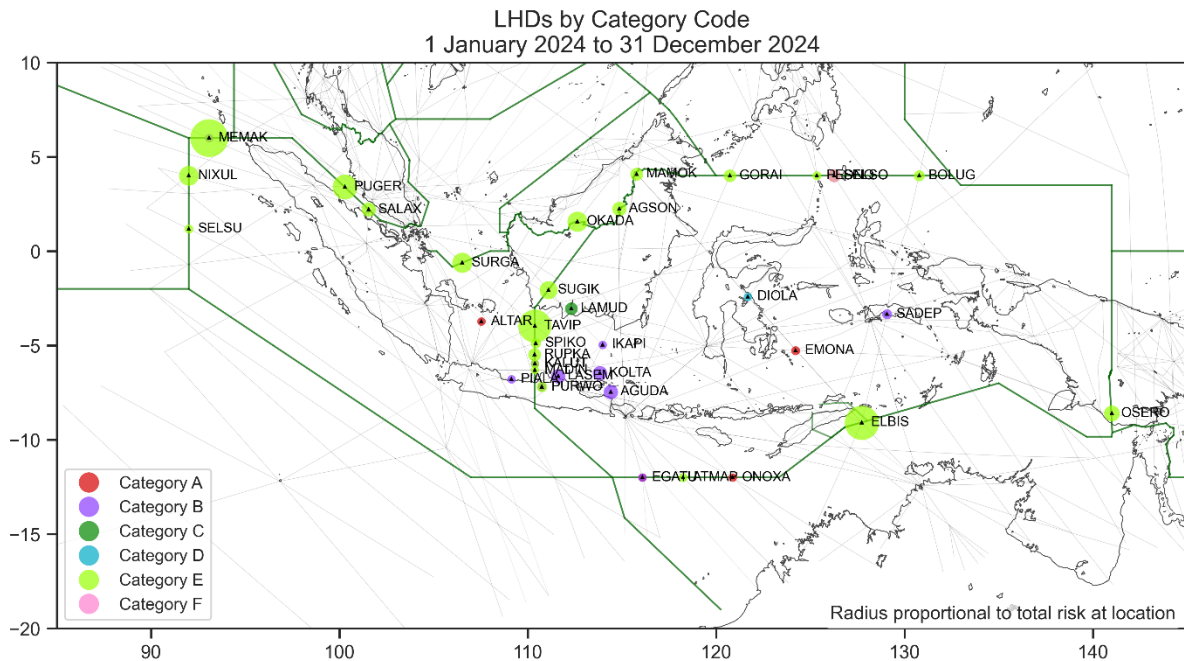


Figure 4: Geolocation of LHDs for the Indonesian FIR for the period 1 January 2024 to 31 December 2024.

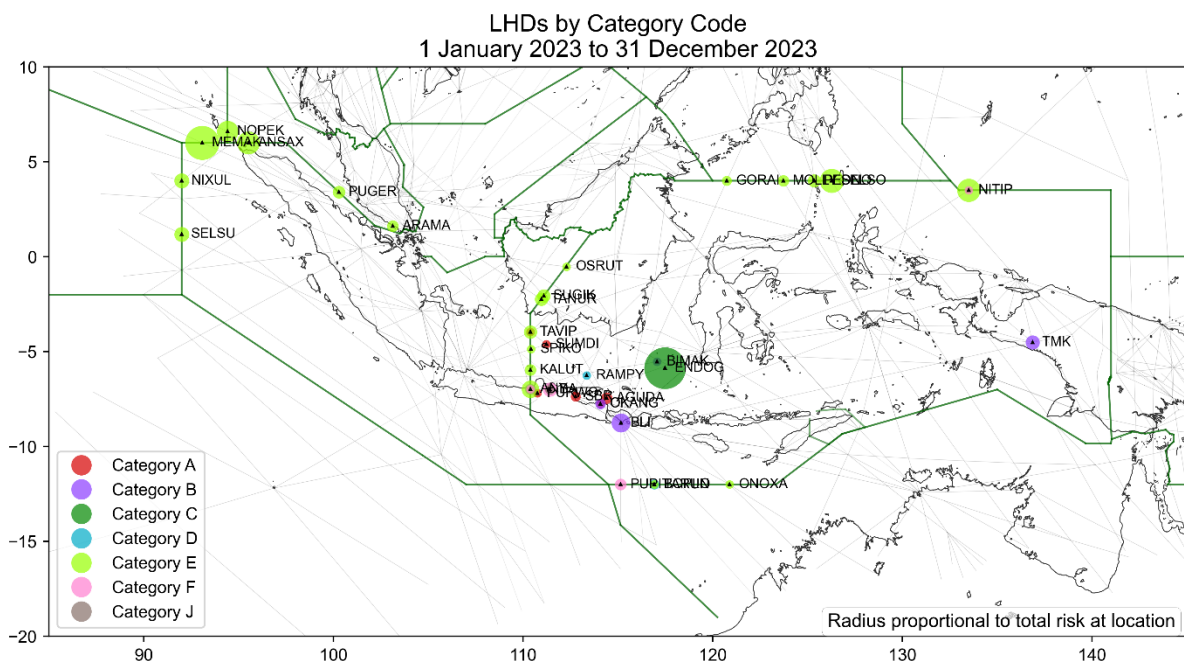


Figure 5: Geolocation of LHDs for the Indonesian FIR for the period 1 January 2023 to 31 December 2023.

Summary and Discussion

2.11 The total risk in 2024 (2.25×10^{-9}) has decreased from the value reported for calendar year 2023 (then 5.35×10^{-9}).

2.12 Almost 83% of the operational risk was presented by 51 Category E LHDs (ATC coordination error as a result of human factor issues). Most involved aircraft flying on 2-way routes, and they reported an average of 0.7 flight levels crossed and 0.3 minutes in duration.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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