

Reference Document related to WP/17

AIRSPACE SAFETY ASSESSMENT FOR THE PLANNED RVSM IMPLEMENTATION IN MONGOLIA AIRSPACE

Presented by



Monitoring Agency for Asia Region

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1. INTRODUCTION

This document provides updated results of the airspace safety assessment for the RVSM implementation in the Mongolia airspace, based on a one-month traffic sample data (TSD) collected in **October 2010** and the most recent 12 month Large Height Deviation (LHD) reports between **August 2010** and **July 2011** submitted by the State of Mongolia.

The content of the document includes:

- Background
- Summary of LHD occurrences, and
- Results of RVSM risk assessment

Note that the MAAR will provide another updated results of airspace safety assessment for the RVSM implementation of the Mongolia airspace, including the August-2011 LHD report, to the Secretary of the RASMAG for further coordination with the EURASIA TF.

2. BACKGROUND

Referred to the RASMAG/15, the MAAR informed the meeting of the risk estimate for the planned RVSM implementation in the Mongolia airspace that:

- The technical risk satisfied the agreed technical risk target level of safety (TLS) value of no more than 2.5×10^{-9} fatal accidents per flight hour,
- The overall risk estimate of 11.2×10^{-9} exceeded the TLS of 5.0×10^{-9} fatal accidents per flight hour, mainly due to a number of long duration LHD occurrences.

The meeting was concerned at the risk level determined by MAAR specifically as this was a pre-implementation assessment. Noting the existence of a number of high duration LHDs, the meeting suggested that MAAR should undertake further assessments to end of August to see the effect of the rolling 12 month LHD sample.

In further discussing the assessment, the meeting agreed that it could not endorse an implementation given the current risk estimation and the nature of the LHDs reported. To assist the EURASIA Task Force with the GO/NO-GO decision, MAAR agreed to undertake monthly assessments to be forwarded to the EURASIA TF and to RASMAG members by the Secretary. The meeting acknowledged that the final decision would rest with the EURASIA

TF in consultation with both the Paris and Bangkok ICAO Regional Offices, and that they should also receive these assessments.

3. SUMMARY OF LHD OCCURRENCES

Based on the received LHD reports, the LHD occurrences between January 2010 and July 2011 in the airspace of Mongolia are summarized in **Table 1** as follows:

Month-Year	No. of LHD Occurrences	Associated LHD Duration (Minutes)	12-month Cumulative Occurrences	12-month Cumulative Duration
January 2010	0	0	0	0
February 2010	0	0	0	0
March 2010	1	5	1	5
April 2010	0	0	1	5
May 2010	0	0	1	5
June 2010	1	20	2	25
July 2010	0	0	2	25
August 2010	1	34	3	59
September 2010	0	0	3	59
October 2010	0	0	3	59
November 2010	3	55	6	114
December 2010	1	3	7	117
January 2011	2	26	9	143
February 2011	0	0	9	143
March 2011	1	0	9	138
April 2011	1	1	10	139
May 2011	0	0	10	139
June 2011	1	1	10	120
July 2011	1	1	11	121

Table 1: Summary of LHD Occurrences and Duration

Note:

- The highlighted rows in **Table 1** are the most recent LHD reports submitted by the State of Mongolia after the RASMAG/15.
- The bolded months in Table 1 are the 12-rolling month
- The detailed information of the reported LHD occurrences is provided in the **Appendix**.

Table 2 summarizes the number of LHD occurrences used in the safety assessment (August 2010 – July 2011) and the associated LHD duration (in minutes) by cause of deviation.

LHD Category Code	LHD Category Description	No. of LHD Occurrences	LHD Duration (Minutes)
A	Flight crew failing to climb/descend the aircraft as cleared	1	50
B	Flight crew climbing/descending without ATC clearance	1	3
D	ATC system loop error; (e.g. ATC issues incorrect clearance or flight crew misunderstands clearance message)	1	21
E	Coordination errors in the ATC to ATC transfer or control responsibility as a result of human factors issues (e.g. late or non-existent coordination, incorrect time estimate/actual, flight level, ATS route etc not in accordance with agreed parameters)	4	3
J	TCAS resolution advisory; flight crew correctly following the resolution Advisory	1	-
M	Other – this includes situations of flights operating (including climbing/descending) in airspace where flight crews are unable to establish normal air-ground communications with the responsible ATS unit.	3	44
Total (August 2010 – July 2011)		11	121

Table 2: Summary of LHD Causes in the Mongolian RVSM Airspace

In light of the above, the LHD occurrences in the Mongolia airspace are summarized as follows:

- There were a total of 11 LHD occurrences accounting for 121-minute duration between August 2010 and July 2011.
- The total duration was mainly driven by three long-duration LHD occurrences.
- The three longest duration occurrences (50, 34, and 21 minutes) account for 86 percents of the total duration (105 of 121 minutes).
- Between May and July 2011, there were 2 LHD occurrences. One was in June, and the other was in July 2011. Each LHD occurred for one minute due to coordination error.
- **Figure 1** presents the locations of the two LHD occurrences between May and July 2011.

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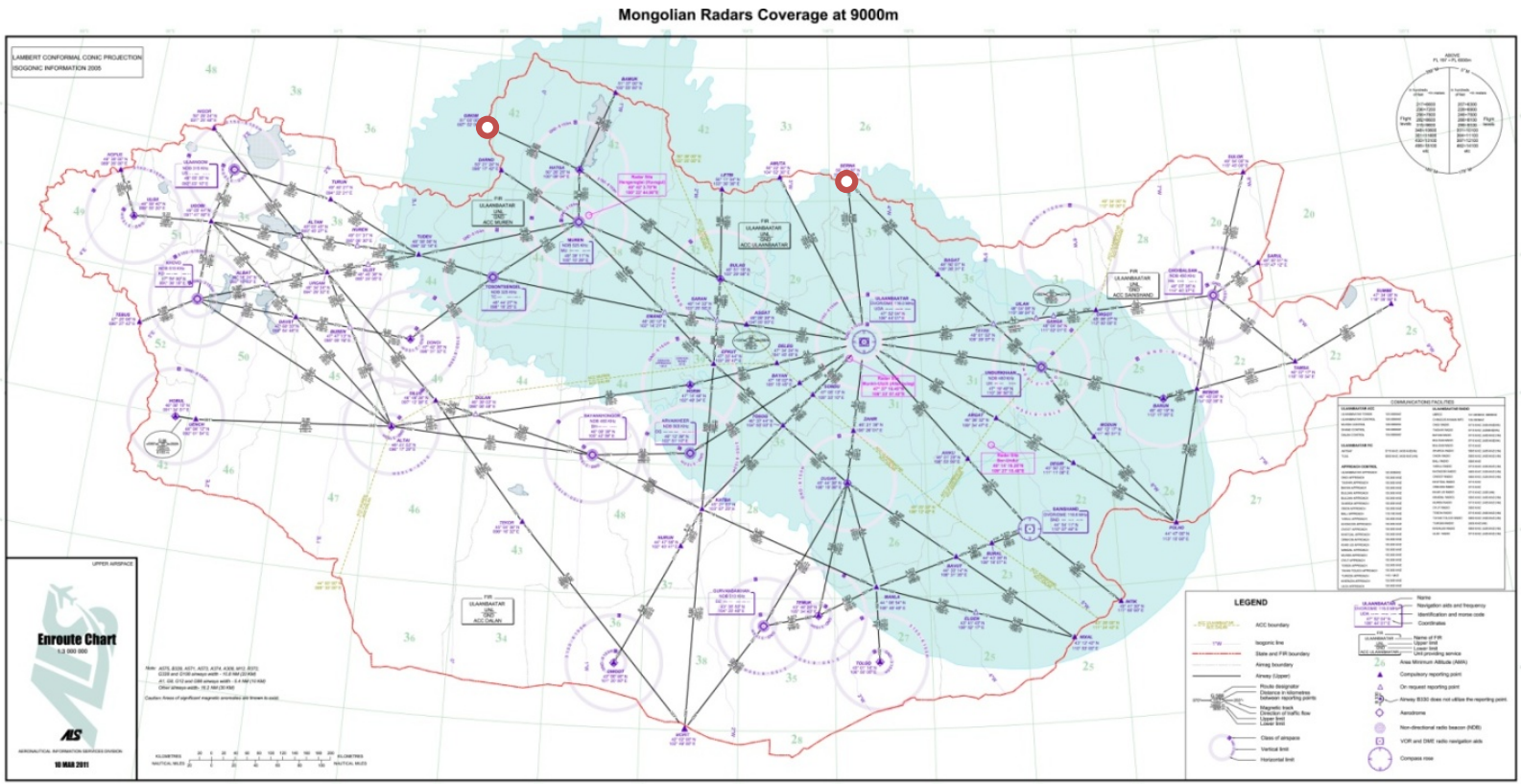


Figure 1: Locations for LHD Occurrences in June and July 2011

4. RISK ASSESSMENT RESULTS

Table 4 summarizes the results of the risk assessment in terms of technical, operational, and total risks for the RVSM implementation in the Mongolia airspace as of July 2011.

Source of Risk	Lower Bound Risk Estimation	TLS	Remarks
Technical Risk	0.51×10^{-9}	2.5×10^{-9}	Below Technical TLS
Operational Risk	9.31×10^{-9}	-	-
Total Risk	9.82×10^{-9}	5.0×10^{-9}	Exceeds Overall TLS

Table 4: Risk Estimates for the RVSM Implementation in the Mongolia Airspace

Figure 2 presents the trends of collision risk estimates for each month using the appropriate 12-month interval of LHD reports.

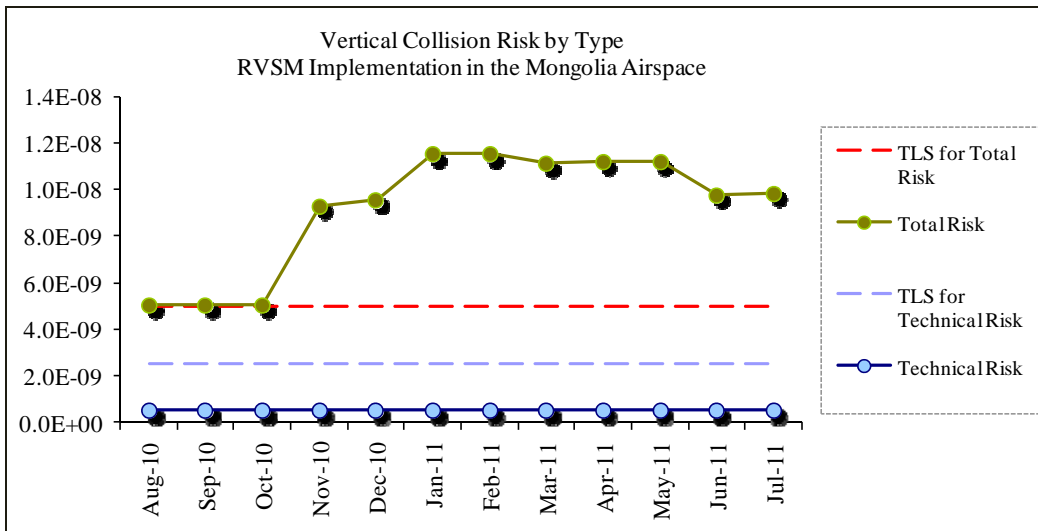


Figure 2: Trends of Risk Estimates for the RVSM Implementation in the Mongolia Airspace

Based on the additional LHD reports (May-July 2011), the overall risk estimate has improved from 11.20×10^{-9} in April 2011 to 9.82×10^{-9} in July 2011. The improvement is mainly due to an absence of 20-minute duration of June 2010 LHD from this assessment period. Since the availability of radars in March 2011, there has not yet been any long duration LHD reported to MAAR. Nonetheless, **the overall risk estimate exceeds** its target level of safety of 5.0×10^{-9} fatal accidents per flight hour.

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APPENDIX: Detailed LHD Occurrences in the Airspace of Mongolia

No.	Date (dd-mm-yy)	Fix	Route	FL Assigned	FL Observed	Duration (Min)	Cause/Remarks
1	30-03-2010	DARNO	A575	11100	12100	5	Incorrect coordination from neighboring sector. Neighboring sector forgot to send revision after change of flight level of the traffic.
2	04-06-2010	MODUM	M520	8600	9600	20	Incorrect pilot action. Pilot issued clearance for FL8600 from ATC and rode it back correctly, but took FL 9600
3	30-08-2010	GINOM	A308	11100	10100	34	Incorrect Marking of Assistant controller. Assistant Controller confused coordination message with other message
4	05-11-2010	URGAM	B330	9600	-	-	TCAS RA Climb
5	08-11-2010	BAVUT	B208	11600	11100	50	Incorrect Pilot action/ Possible wrong altitude settings. Pilot issued clearance for FL11600 from ATC and rode it back correctly, but took FL11100.
6	22-11-2010	BULAG	B208	9600	10600	5	Assistant Controller missed to make revision
7	15-12-2010	UDA	A575	10600	11600	3	Pilot execute climb without controller permission
8	05-01-2011	MENOR	G218	10100	10400	21	Read back error. Controller didn't hear when pilot read back wrong level
9	21-01-2011	SERNA	M520	11100	10100	5	Incorrect marking of Assistant controller. Assistant Controller mixed coordination message with other message
10	04-03-2011	NIXAL	B208	9600	10600	0	Neighboring ACC sent revision late, flight data of receiving unit didn't make revision on flight progress strip
11	06-04-2011	GINOM	A308	10100	11100	1	Coordination error. Neighboring ACC didn't make revision
12	19-06-2011	GINOM	A308	10100	11100	1	Coordination error. Neighboring ACC didn't make revision
13	09-07-2011	SERNA	M520	10100	11100	1	Coordination error. Neighboring ACC didn't make revision