



RASMAG Plain Language definition of Large Height Deviation (LHD)

Based on, amongst others, the *Guidance Material on the Implementation of a 300 M (1,000 ft) Vertical Separation Minimum (VSM) between FL290 and FL410 Inclusive for Application in the Airspace of the Asia Pacific Region* and discussions during the meeting, during 2007 RASMAG adopted the following plain language definition of a Large Height Deviation for regional promulgation:

A RVSM large height deviation (LHD) is defined as any vertical deviation of 90 metres/300 feet or more from the flight level expected to be occupied by the flight

RASMAG also agreed to promulgate the following guidance (see below) to support the plain language definition of a LHD.

4.1 The causes of a LHD occurrence include:

- Operational errors (aircraft operating at a flight level other than the assigned flight level due to ATC/Pilot loop errors and incorrect clearance), which are categorized into three causes:
 - Flight crew not following the correct ATC clearance
 - ATC issuing an incorrect ATC clearance
 - Receiving ATC unit unable to apply the separation standards during a transfer of control responsibility between two ATC units.
- Aircraft contingency events occurring in situation where the pilot cannot initially follow normal contingency procedures and is forced to climb/descend through flight levels before diverting from track,
- Deviation due to the effect of high level meteorological conditions, and/or
- Deviation due to Traffic Collision Avoidance System (TCAS) advisories, which includes:
 - Flight crew correctly following the TCAS Resolution Advisory (RA), [see note below],
 - Flight crew incorrectly following the TCAS RA, and
 - Any vertical displacement not conforming to the resolution advisory.

Note: RASMAG stressed that it was important to note that a LHD resulting from actions complying with a TCAS RA would not reflect risk in the RVSM airspace since it is a proper remedial action of flight crew to prevent a possible mid-air collision between aircraft. Nonetheless, it was strongly recommended that all LHD occurrences related to TCAS resolution advisory be reported to the responsible RMA for detailed airspace safety analyses.



**RASMAG Categorization of Large Height Deviations (LHD) in
RVSM Safety Monitoring Reports for application by
Asia/Pacific RVSM Regional Monitoring Agencies (RMAs)**

The APANPIRG Regional Airspace Safety Monitoring Advisory Group (RASMAG) recognized that in order to be consistent with the RASMAG plain language LHD definition and associated guidance listing possible causes of LHD occurrences adopted by RASMAG during 2007, standardization of the LHD categorizations applied by Asia/Pacific RMAs was necessary. Accordingly, RASMAG adopted and promulgated the LHD categorizations described in Table 1 below for application by all RMAs serving the Asia/Pacific region.

(last updated RASMAG/8 December 2007)

Code	RVSM Operations Large Height Deviation (LHD) Categorization
Operational Errors	
A	flight crew failing to climb/descend the aircraft as cleared;
B	flight crew climbing/descending without ATC clearance;
C	Incorrect operation or interpretation of airborne equipment (e.g. incorrect operation of fully functional FMS, incorrect transcription of ATC clearance or re-clearance, flight plan followed rather than ATC clearance, original clearance followed instead of re-clearances etc);
D	ATC system loop error; (e.g. ATC issues incorrect clearance or flight crew misunderstands clearance message);
E	coordination errors in the ATC-to-ATC transfer of 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);
F	coordination errors in the ATC-to-ATC transfer of control responsibility as a result of equipment outage or technical issues;

Aircraft Contingency Events	
G	aircraft contingency event leading to sudden inability to maintain assigned flight level (e.g. pressurization failure, engine failure);
H	airborne equipment failure leading to unintentional or undetected change of flight level (e.g. altimetry errors);
Deviation due to Meteorological Condition	
I	turbulence or other weather related causes;
Deviation due to TCAS RA	
J	TCAS resolution advisory; flight crew correctly following the resolution advisory; <i>Note: LHD resulting from actions complying with a TCAS RA would not reflect risk in the RVSM airspace since it is a proper remedial action of flight crew. Nonetheless, it is strongly recommended that all LHD occurrences related to TCAS resolution advisory be reported to the responsible RMA for detailed airspace safety analysis.</i>
K	TCAS resolution advisory; flight crew incorrectly following the resolution advisory
Others	
L	An aircraft being provided with RVSM separation is not RVSM approved (e.g. flight plan indicating RVSM approval but aircraft not approved, ATC misinterpretation of flight plan)
M	Other <i>Note: 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.</i>

Table 1: LHD Categorizations utilized by Asia/Pacific RMAs