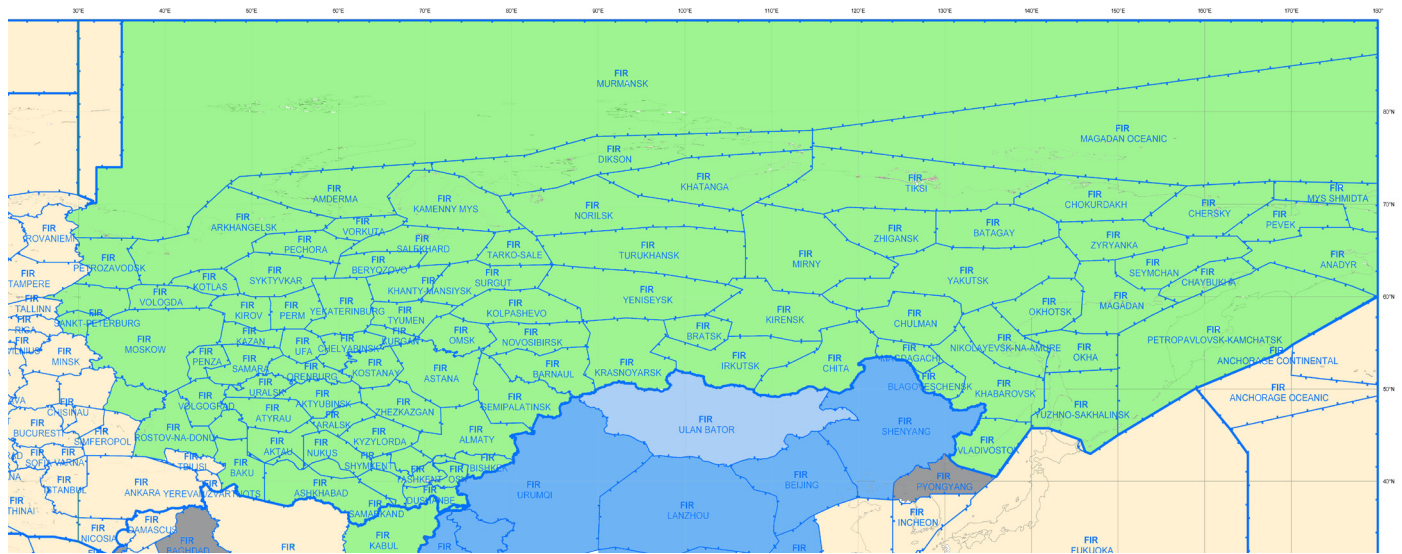


Introduction of RVSM in the airspace of the Russian Federation and adjacent territories



Summary

At 0001 UTC 17 November RVSM was introduced in the FIRs of the Russian Federation as well as those of Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan between FL291 FL410.

Background

Reduced Vertical Separation Minima (RVSM) operations are due to be introduced into the airspace of the FIR/UIRs of the following countries: Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan at 00:01UTC 17 November 2011. The changeover is a landmark not only since it is geographically the largest RVSM changeover but also because it will see vertical positioning referenced as a Flight Level throughout the affected airspace (above transition altitude) rather than in metres. The exception to this is in the Ulaanbataar FIR, (see 12ATSBL07 click [here](#)) which will continue to use metric references. The information contained in this briefing leaflet is derived from information contained in AICs issued by the Russian Federal Air Transport Agency as well as data from the Kazakh Air Navigation Service Provider (ANSP) however the procedures described in the Russian AIC will be also applied in Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

Normal procedures

RVSM Flight Levels

RVSM will be applied to airspace between FL290 (8,550m) and FL410 (12,500m) inclusive. It is important to note that above transition altitude assignments in the vertical plane will be given in FL. The conversions from FL to feet or metres will be those expressed in Table A of Appendix 3 of ICAO Annex 3 (see fig 2).

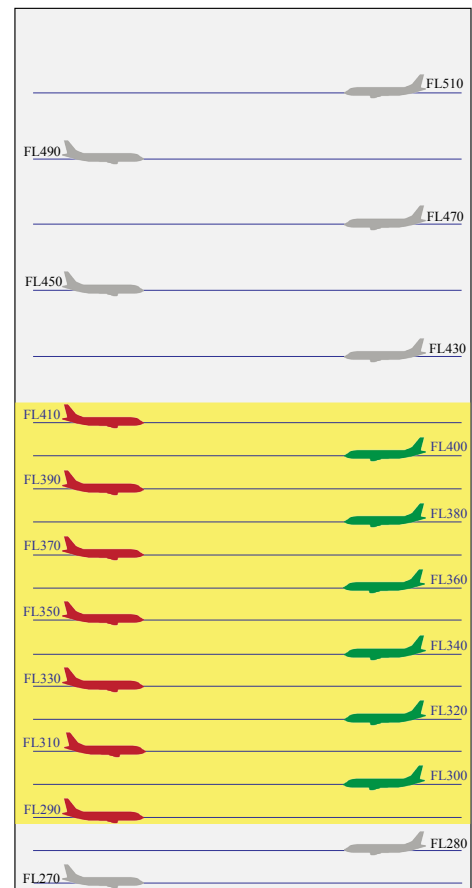


Fig 1 - RVSM Flight Levels

Please note that for aircraft above FL410 the vertical separation minima will be increased to 600m (1,968ft)

Transition altitude/level

Transition altitude/level is variable according to local conditions. In accordance with the Russian AIP below transition level, altimetry will revert to metres. This will be based on QFE within terminal control zones and QNH outside these areas although level flight below transition is usually confined to the terminal area.

Flight Planning

► Aircraft operators intending to operate flights within RVSM airspace must ensure the aircraft is in compliance with the Minimum Aircraft System Performance Specification (RVSM MASPS) and is approved for RVSM operations. Aircraft approved for RVSM operations by any ICAO contracting state are automatically approved for operation in the airspace of the Russian Federation (also applies to Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan)

► Flights by non-RVSM approved aircraft (except for State aircraft), aircraft operating formation flights, aircraft that have lost the ability to maintain the assigned flight level and aircraft which have lost radio communication are prohibited from RVSM airspace. Non RVSM approved aircraft will be assigned flight levels below RVSM airspace. In addition, the following FLs have been designated as for the use of aircraft with radio failure FL150 and FL250 (for aircraft with a true track between 000° & 179°) and FL140 & FL240 (for aircraft with a true track between 180° & 359°).

TRUE Track 000 - 179			TRUE Track 180 - 359		
Flight Level	Metres	Feet	Flight Level	Metres	Feet
010	300	1000	020	600	2000
030	900	3000	040	1200	4000
050	1500	5000	060	1850	6000
070	2150	7000	080	2450	8000
090	2750	9000	100	3050	10000
110	3350	11000	120	3650	12000
130	3950	13000	140	4250	14000
150	4550	15000	160	4900	16000
170	5200	17000	180	5500	18000
190	5800	19000	200	6100	20000
210	6400	21000	220	6700	22000
230	7000	23000	240	7300	24000
250	7600	25000	260	7900	26000
270	8250	27000	280	8550	28000
290	8850	29000	300	9150	30000
310	9450	31000	320	9750	32000
330	10050	33000	340	10350	34000
350	10650	35000	360	10950	36000
370	11300	37000	380	11600	38000
390	11900	39000	400	12200	40000
410	12500	41000	430	13100	43000
450	13700	45000	470	14350	47000
490	14950	49000	510	15500	51000

Extracted from Table A in Appendix 3 to ICAO Annex 2

Fig 2 - Feet (FL) to Metres RVSM conversion table

► Flight plans (FPL) containing accurate information about the aircraft's RVSM approval status must be submitted to the appropriate ANSP prior to entry into Russian airspace and must be submitted not less than three hours before departure. (Please note in the event of an aircraft change or a change in the RVSM status of the aircraft a new FPL will have to be submitted and it will be subject to the three hour rule).

FPLs must include the following information (as appropriate):

- Operators of RVSM approved aircraft shall insert the letter "W" in Item 10 of the ICAO flight plan form (regardless of requested FL).
- Operators of state aircraft shall insert the letter "M" in Item 8 of the ICAO flight plan form.
(Note all operators of non RVSM approved aircraft requesting a FL at or above FL290 shall insert STS/NONRVSM in Item 18 of the ICAO flight plan form).

Additional Flight Plan requirements

Operators of aircraft intending to operate formation flights within the FIRs covered by his Bulletin shall submit FPLs that include in Item 18 "STS/NONRVSM".

(Note the letter "W" should not be inserted into Item 10 regardless of the RVSM status of the aircraft in the formation).

Enroute phase

All flights above the transition altitude shall be operated according to altimeters set to QNE (1013hPa/760mm/hg/29.92"). During phases of flight above the transition altitude aircraft position in the vertical plane will be expressed in flight level and will be assigned by ATC and should be reported by flight crews in accordance with the table in Fig 2 of this bulletin.

Approach Procedures

Transition altitude/level

Transition altitude/level is variable according to local conditions. In accordance with the Russian AIP below transition level, altimetry will revert to metres. This will be based on QFE within terminal control zones and QNH outside these areas although level flight below transition is usually confined to the terminal area.

Altimetry

For approach procedures, altitudes are assigned in metres. Aircraft that are not equipped with metric altimeters will fly the procedures in feet. Many approach charts sources provide a conversion chart on the approach plate that cross reference metres and feet and QFE/QNH altitudes for all of the charted altitudes of the procedure depicted.

QFE

QFE altimeter settings are the normal standard that ATC provides for approach procedures. Most (but not all) airports will accommodate QNH approaches on request.

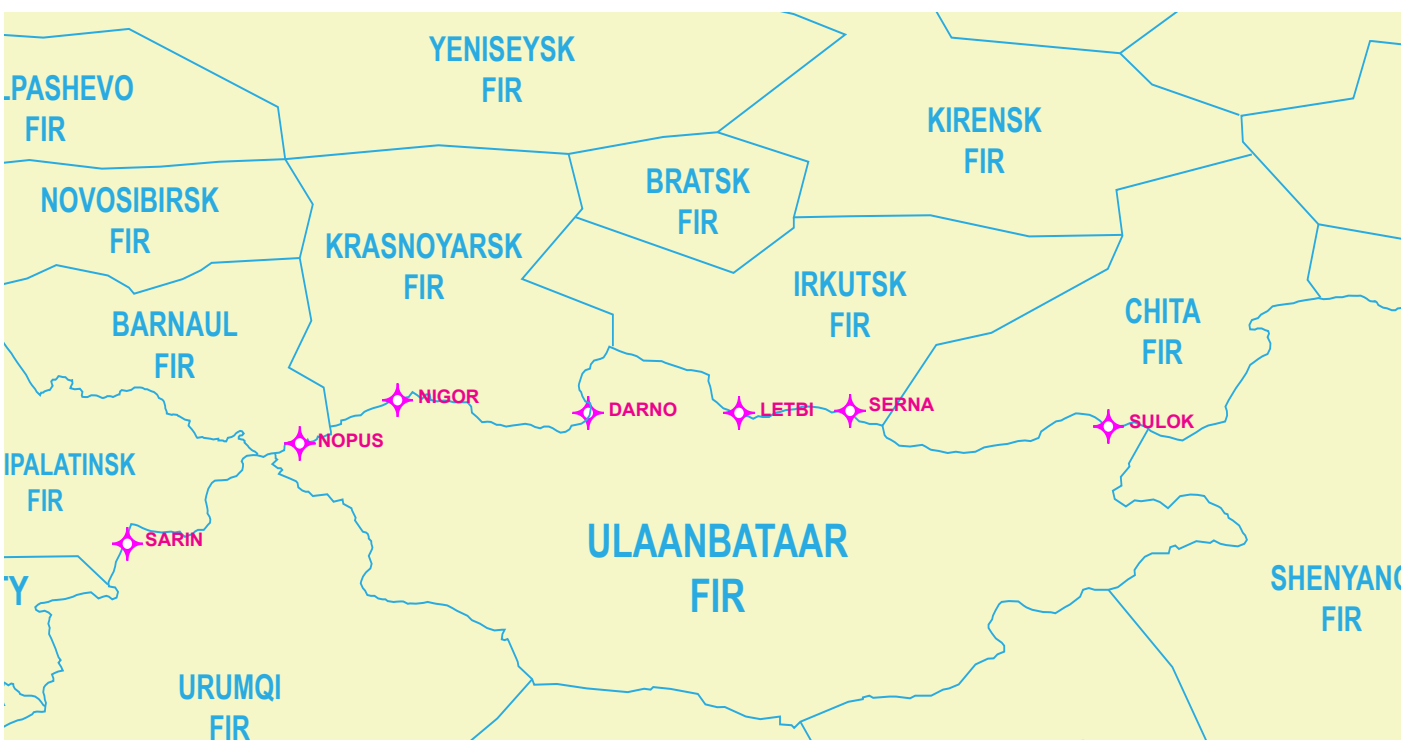
It is essential that the pilots are aware of which altimeter reference they have been given and that they fly the depicted altitudes that correspond to that reference. This can be particularly confusing for pilots of an aircraft with only imperial (feet) referenced altimeters as the cleared altitudes are being provided in metres by ATC. As a safety crosscheck, it is very rare for the aircraft to be cleared below the altitude depicted on the chart for the next segment of the approach, and the aircraft will only be cleared below the depicted approach procedure platform altitude by means of an approach clearance. Therefore, if the cleared altitude, when converted to feet, is lower than that depicted on the plate, it is likely that the controller and the pilot are not using the same altimeter reference and clarification must be obtained.

Emergency procedures

In case of an emergency ATC can, at flight crew request, issue instructions in the vertical plane expressed in either metres or feet however these assignments will correspond the FLs as set out in Fig 1.

Entry and departure to and from Ulaanbataar FIR and Chinese FIRs

In its introduction of RVSM Mongolia has opted to retain metric measurement in the vertical plane, adopting the Metric RVSM system implemented by China in 2008. (see 12ATSBL07 by clicking [here](#)) Accordingly, aircraft will be required to adjust height when entering or leaving the airspace of the Ulaanbataar FIR for FIRs other than in China.



Click on the waypoint name to see the transition procedure for that waypoint.

Phraseology related to RVSM operations

Message	Phraseology
For a controller to ascertain the RVSM approval status of an aircraft:	(call sign) CONFIRM RVSM APPROVED
For a pilot to report non-RVSM approval status: i) On the initial call on any frequency within the RVSM airspace (controller shall provide a read-back with the same phrase); and ii) In all requests for flight level changes pertaining to flight levels within the RVSM airspace; and iii) In all read-backs to flight level clearances pertaining to flight levels within the RVSM airspace. <i>Additionally, except for State aircraft, pilots shall include this phrase to read back flight level clearances involving the vertical transit through 8900m or 12500m</i>	NEGATIVE RVSM
For a pilot to report RVSM approval status:	AFFIRM RVSM
For a pilot of a non-RVSM approved State aircraft to report non-RVSM approval status, in response to the phrase (call sign) CONFIRM RVSM APPROVED:	NEGATIVE RVSM, STATE AIRCRAFT
Denial of clearance into the RVSM airspace:	(call sign) UNABLE ISSUE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN [or DESCEND TO, or CLIMB TO] FLIGHT LEVEL
For a pilot to report when severe turbulence affects the aircraft's capability to maintain the height-keeping requirements for RVSM	UNABLE RVSM DUE TURBULENCE
For a pilot to report that the aircraft's equipment has degraded enroute below that required MASPS Minimum Aviation System Performance Standards for flight within the RVSM airspace. <i>(This phrase is to be used to convey both the initial indication of the non-MASPS compliance, and henceforth, on initial contact on all frequencies within the lateral limits of the RVSM airspace until such time as the problem ceases to exist, or the aircraft has exited the RVSM airspace.)</i>	UNABLE RVSM DUE EQUIPMENT
For a pilot to report the ability to resume operations within the RVSM airspace after an equipment or weather-related contingency.	READY TO RESUME RVSM
For a controller to confirm that an aircraft has regained its RVSM approval status or to confirm that the pilot is ready to resume RVSM operations.	REPORT WHEN ABLE TO RESUME RVSM

Example 1:

A non-RVSM approved aircraft, maintaining FL260, subsequently requests a climb to FL320.

Pilot: (call sign) REQUEST FL320m, NEGATIVE RVSM

Controller: (call sign) CLIMB TO FL320

Pilot: (call sign) CLIMB TO FL320, NEGATIVE RVSM

Example 2:

A non-RVSM approved aircraft, maintaining FL360, subsequently requests a climb to FL380.

Pilot: (call sign) REQUEST FL380, NEGATIVE RVSM

Controller: (call sign) CLIMB TO FL380

Pilot: (call sign) CLIMB TO FL380, NEGATIVE RVSM

Example 3:

A non-RVSM approved civil aircraft maintaining FL270, subsequently requests a climb to FL320.

Pilot: (call sign) REQUEST FL320, NEGATIVE RVSM

Controller: (call sign) UNABLE ISSUE CLEARANCE INTO RVSM AIRSPACE, MAINTAIN FL270

Guidance for pilots in the event of aircraft system malfunction or turbulence greater than moderate

Initial pilot actions in contingency situations

<p>Initial Pilot Actions when unable to maintain flight level (FL) or unsure of aircraft altitude-keeping capability:</p> <ul style="list-style-type: none"> • Notify ATC and request assistance as detailed below. • Maintain cleared flight level, to the extent possible, while evaluating the situation. • Maintain watch for conflicting traffic both visually and by reference to TCAS. • Alert nearby aircraft by illuminating exterior lights. • If unable to contact ATC, broadcast position, flight level and intention on 121.5 MHZ (or, as a backup 5680KHZ).
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Severe turbulence and/or mountain wave activity (MWA) induced altitude deviations of more than approx 60m (200ft)

<p>Pilot actions:</p> <ul style="list-style-type: none"> • When experiencing severe turbulence and/or MWA induced altitude deviations of approximately 60m (200ft) or greater, pilot will contact ATC and state 'Unable RVSM Due (state reason)' (e.g., turbulence, mountain wave). • If not issued by the controller, request vector clear of traffic at adjacent FL's. • If desired, request FL change. • Report location and magnitude of turbulence or MWA to ATC. 	<p>Controller actions:</p> <ul style="list-style-type: none"> • Assess the traffic situation to determine if the aircraft can be accommodated through the provision of lateral, longitudinal or increased vertical separation and, if so, apply the appropriate minimum. • Advise pilot of conflicting traffic. • Issue FL change, traffic permitting. • Issue PIREP to other aircraft.
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MWA Encounters - general

Note: MWA encounters do not necessarily result in altitude deviations on the order of 60m (200ft). The guidance below is intended to address less significant MWA encounters.

<p>Pilot actions:</p> <ul style="list-style-type: none"> • Contact ATC and report experiencing MWA. • Report location and magnitude of MWA to ATC. • If so desired, pilot may request a FL change or deviation from the intended route. 	<p>Controller actions:</p> <ul style="list-style-type: none"> • Advise pilot of conflicting traffic at adjacent FL. • If pilot requests, vector aircraft to avoid merging target with traffic at adjacent RVSM flight levels, traffic permitting. • Issue FL change or re-route, traffic permitting. • Issue PIREP to other aircraft.
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Wake turbulence encounters

<p>Pilot actions:</p> <ul style="list-style-type: none"> • Contact ATC and request vector, FL change or, if capable, a lateral offset to right 2NM. 	<p>Controller actions:</p> <ul style="list-style-type: none"> • Issue clearance of vector, FL change or lateral offset to right 2NM, traffic permitting.
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Unable RVSM due to equipment (Failure of automatic altitude control system, altitude alerter or all primary altimeters)

<p>Pilot actions:</p> <ul style="list-style-type: none"> • Contact ATC and state "Unable RVSM Due Equipment". • Request clearance out of RVSM airspace unless operational situation dictates otherwise. 	<p>Controller actions:</p> <ul style="list-style-type: none"> • Provide 600m (2000ft) vertical separation or appropriate horizontal separation. • Clear aircraft out of RVSM airspace unless operational situation dictates otherwise.
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One primary altimeter remains operational

<p>Pilot actions:</p> <ul style="list-style-type: none"> • Cross check stand-by altimeter. • Notify ATC of operation with single primary altimeter. • If unable to confirm primary altimeter accuracy, follow actions for failure of all primary altimeters. 	<p>Controller actions:</p> <ul style="list-style-type: none"> • Acknowledge operation with single primary altimeter. <i>Note: Aircraft are able to operate in RVSM airspace with this situation except that pilots should report unable RVSM due equipment.</i> • Relay to other controllers or facilities who will subsequently handle the aircraft and any special handling requirement or being provided.
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Transponder failure

<p>Pilot actions:</p> <ul style="list-style-type: none"> • Contact ATC and request authority to continue to operate at cleared flight level. • Comply with revised ATC clearance, if issued. 	<p>Controller actions:</p> <ul style="list-style-type: none"> • Consider request to continue to operate at cleared flight level. • Issue revised clearance, if necessary.
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Procedures for aircraft requiring rapid descent

<p>Pilot actions:</p> <p>Notify ATC of aircraft location and request FL change as required.</p> <ul style="list-style-type: none"> • Upon declaring an emergency a pilot may exercise his right and change his assigned flight level. He shall notify ATC immediately and submit a report upon arrival at the destination. • If unable to contact ATC and rapid descent required: <ol style="list-style-type: none"> a) Deviation procedure for level change: 30° right and track out 20 kilometers (i.e. deviate right of airway centerline by 10 km or 5 NM), then turn left to track parallel the original route, then climb or descend to the new level, and then return to the original one (when appropriate). <i>Note: When return to the original route, it is possible to have conflict traffic on that route.</i> b) Establish communications with and alert nearby aircraft by broadcasting, at suitable intervals: flight identification, flight level, aircraft position and intention on the frequency in use, as well as on frequency 121.5 MHZ (or, as a backup 5680KHZ). c) Establish visual contact with conflicting traffic. d) Turn on all aircraft exterior lights. 	<p>Controller actions:</p> <ul style="list-style-type: none"> • Issue ATC clearance to change flight level.
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