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Reduced Vertical Separation Minimum (RVSM)

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Vertical Separation

- Vertical separation between aircraft used to be 2,000 ft (600 m) at or above FL 290

Historically, because of the reduction in pressure sensing accuracy of barometric altimeters with increasing altitude, it was necessary to increase the vertical separation between aircraft to 2000 ft (600m) above FL 290

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What is RVSM?

- Today, reduced vertical separation minimum **1,000 ft (300 m)** is commonly used between certain types of aircraft operated by certain operators in certain conditions.

Guidance material relating to RVSM is contained in the *Manual on Implementation of a 300m (1000ft) Vertical Separation Minimum between FL 290 and FL 410 Inclusive* (Doc 9574).

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What affects RVSM operations?

- With the introduction of the reduced vertical separation, concern is **turbulence** which can be detrimental to accurate height-keeping include:
 - a) gravity shear waves;
 - b) thunderstorms;
 - c) orographic flow.

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Orographic flow

- Orographic flow (mountain wave activity) has been identified as being particularly detrimental to accurate height-keeping. States known to have airspace susceptible should:
- a) assign responsibility for forecasting such conditions; and
 - b) detail the action required by ATC on receipt of such forecasts.

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Other turbulence

Wake turbulence: the air turbulence behind an aircraft caused by contra rotating vortices from the wingtips. It is particularly severe when generated by large, heavy, wide-bodied jet aircraft, and it is most dangerous to following aircraft during take-off, initial climb final approach and landing.



To Mitigate Wake Turbulence

PANS-ATM, Sections 5.8 and 8.7.3 provide for greater separations in respect of preceding HEAVY and MEDIUM aircraft.

e.g. A preceding HEAVY arrival and a following LIGHT arrival
– 3 Minutes / 6 NM



To Mitigate the Wake Turbulence

Strategic Lateral Offset Procedures in oceanic and remote continental airspace, where offsets have been designed to mitigate the lateral overlap probability and the effects of wake turbulence of preceding aircraft.

One of the three available options (0, 1, 2 NM to the right of centerline) may be used.

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Are they good enough?

- On 13 August 2005, an incident involving wake turbulence was reported.
- B757-200 experienced a violent and uncontrollable roll of 45 degrees accompanied by a 400 ft loss of altitude.
- The preceding aircraft was A345 with a separation of 9 NM horizontally and 1000 ft vertically.

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Severe turbulence

- When severe turbulence is reported, whatever the cause, ATC should be required to provide 2,000 ft vertical separation as soon as possible.
- ATC authority should report the vertical deviation with 300 ft or greater, for any reason, Large Height Deviation, to the regional monitoring agency.