IFALPA
The Global Voice of Pilots

Air Traffic Services
Briefing Leaflet

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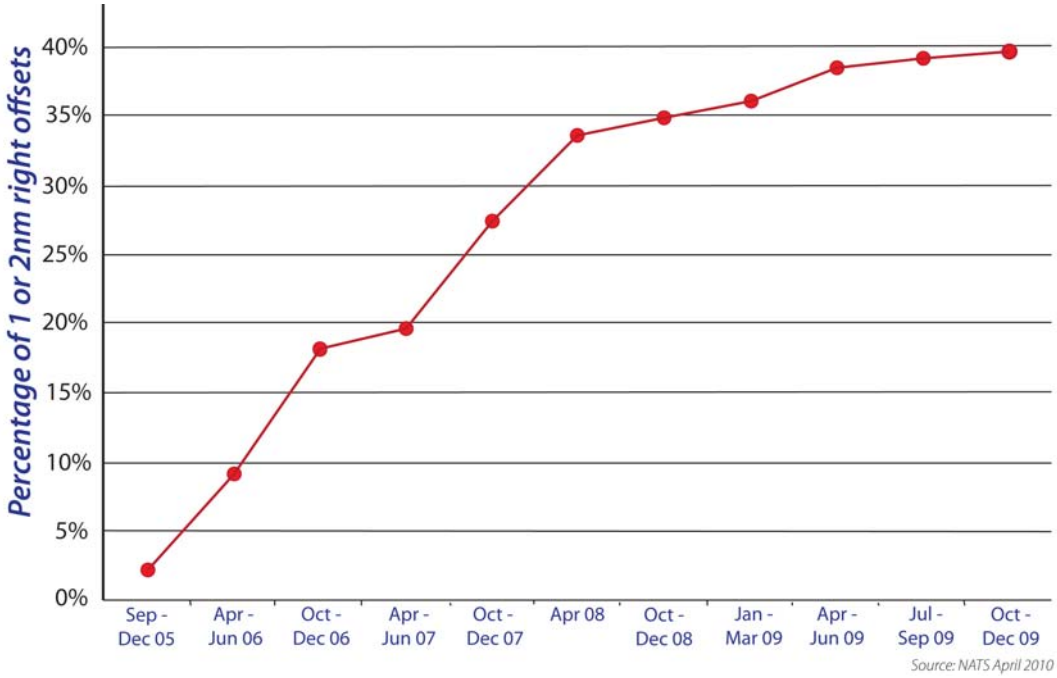
Strategic Lateral Offset Procedure (SLOP)

Background

In recent years the increasing accuracy of navigation equipment has meant that aircraft are now routinely flying courses which are within a few tens of metres of the centreline of the planned route and within a few feet of the assigned altitude. Often the accuracy is even better than that. This improvement in performance has had the unintended consequence of increasing the probability of loss of separation incidents which, in turn, increases the risk of collisions. The 2006 mid air collision between an Embraer Legacy and a 737-800 over Brazil is a prime example of two aircraft that collided because they were both following a very accurate course within metres of the airway centreline. Likewise, in the vertical plane greater traffic volumes mean there is a greater probability of aircraft flying overlapped vertically. Naturally this brings with it a greater risk of loss of separation due to a variety of factors; not least deviations from assigned altitude or ATC co-ordination errors which, between them, account for 86% of the minutes spent at the wrong flight level according to the North Atlantic Central Monitoring Agency (NAT CMA). In addition, naturally occurring weather related turbulence as well as wake turbulence can lead to separation loss.

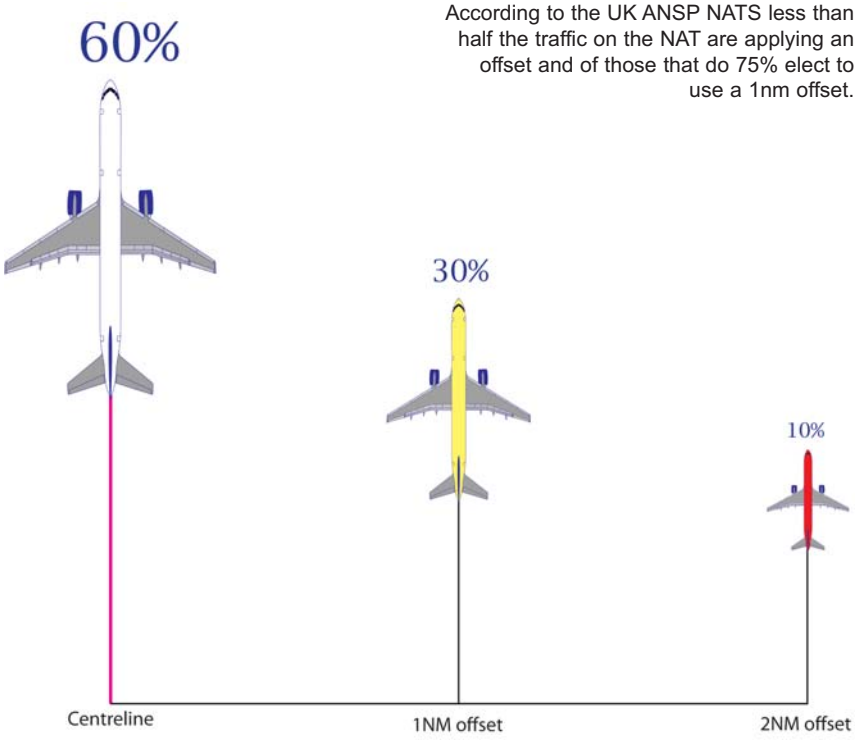
However, there is a remedy and one which has been available to crews since 2004. The Strategic Lateral Offset Procedure (SLOP) allows crews the discretion to fly either on the airway centreline or conversely offset to the right by either 1 or 2nm. The idea being that a random application of the procedure will dramatically reduce the risk of loss of separation events (generally accepted figures suggest that a 33% SLOP uptake reduces collision risk by 50%). The key to this dramatic reduction in risk is the randomness of offset application. In order to create this randomness it is recommended that aircraft operator procedures must not specify any one of the three offset options for regular use (assuming that the aircraft has an automatic offsetting capability).

The UK air navigation service provider (ANSP) NATS has been routinely collecting SLOP application data on behalf of ICAO since 2005. While headline figures revealed by the data gives some encouragement; by the end of 2009 some 40% of flights were using an offset, there is still a concern that the distribution remains unbalanced with 60% of flights on centreline, 30% at 1nm offset and 10% 2nm offset (at 30W) this compares with the optimum 33/33.5/33.5 distribution that will deliver the greatest risk reduction. Clearly, if three aircraft at adjacent flight levels start on a westbound track at similar time and all elect to offset by a mile then, although they are recorded as SLOP flights, there is no risk reduction compared with all three aircraft following the airway or track centreline.



There were significant increases in the use of offsets in the NAT in the period Sep 05 to Dec 08 - and this matches various awareness campaigns. However, the rate of increase my also be due to increased ADS based reporting in the same time period. Certainly, since January of 2009 the growth in offset use has slowed and is still around 26% lower than the optimum.

There are a number of reasons for this imbalance in distribution. Firstly, it is apparent that either because of a lack of SLOP awareness, airline SOPs that call for centreline tracking or a shortfall in aircraft equipment, well over half of the flights monitored are following the centreline. Secondly, 75% of the flights using an offset are electing to use a 1nm offset instead of the 2nm option.
There are probably two primary reasons for this: Airline policy - It is readily apparent from the NATS data that at some airlines there is a distinct preference for the 1nm offset. In the case of one airline while 96.2% of its flights apply an offset 95.4% of these are by 1nm. (not that a policy driven implementation precludes a balanced distribution – one airline's data shows that it's offset distribution is within one percent of the mathematical optimum).



According to the UK ANSP NATS less than half the traffic on the NAT are applying an offset and of those that do 75% elect to use a 1nm offset.

Human nature – there may be a tendency when given a choice between 1 and 2 for '1' to be a sub-conscious preference.

Maximising the benefits of SLOP

The safety benefits of SLOP in any remote RVSM airspace (Oceanic or otherwise) are obvious and that is why IFALPA believes that the full implementation of SLOP will bring significant reductions in loss of separation risk and, accordingly, argues that crews should apply the use of SLOP whenever they operate in airspace that permits its use. In order to maximise the safety improvement, the use of SLOP must follow the principles defined in PANS ATM specifically that the offset used must be selected randomly taking into account tactical considerations. In order to achieve this flexibility, it is important that airlines do not limit the options available to crews in their SOPs (unless the aircraft flown does not have an automatic offset capability in its navigation system – in which case flying the centreline is the only option).

SLOP Checklist

REMEMBER all offsets must be flown to the RIGHT of the centerline.

Aircraft without automatic offset programming capability must fly the centreline.

Operators capable of programming automatic offsets may fly the centreline or offset one or two nautical miles right of centreline to obtain lateral spacing from nearby aircraft. An aircraft overtaking another aircraft should offset within the confines of this procedure, if capable, so as to create the least amount of wake turbulence for the aircraft being overtaken.

Pilots should use whatever means are available (e.g. TCAS, communications, visual acquisition, GPWS) to determine the best flight path to fly.

For wake turbulence purposes pilots must also fly one of the three positions shown in Fig 2. Pilots should not offset to the left of centreline nor offset more than 2 nm right of centreline. Pilots may contact other aircraft on the air-to-air channel, 123.45 MHz, as necessary, to co-ordinate the best wake turbulence mutual offset option. As indicated below contact with ATC is not required.

Pilots may apply an offset outbound at the oceanic entry point and must return to centreline prior to the oceanic exit point.

Aircraft transiting radar-controlled airspace mid-ocean should remain on their already established offset positions.

There is no ATC clearance required for this procedure and it is not necessary that ATC be advised.

Voice Position reports should be based on the waypoints of the current ATC clearance and not the offset position.