International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Sixth Meeting of the Air Traffic Management / Communications, Navigation and Surveillance Subgroup (ATM/CNS/SG/6) - ATM Committee
Boca Chica, Dominican Republic, 30 June-4 July 2008

Agenda Item 2: Report of the ATM Committee Task Forces
2.1 Performance-based navigation (PBN)

STRATEGIC LATERAL OFFSET PROCEDURE (SLOP)
PROPOSED IMPLEMENTATION IN THE CAR/SAM REGIONS

(Presented by the International Federation of Air Line Pilots' Association – IFALPA)

SUMMARY

The use of highly accurate navigation systems (such as the global navigation satellite system (GNSS)) by an increasing proportion of the aircraft population has had the effect of reducing the magnitude of lateral deviations from the route centre line and, consequently, increasing the probability of a collision, should a loss of vertical separation between aircraft on the same route occur.

Strategic Lateral Offset Procedures SLOP can reduce this risk.

Action by the Meeting is in paragraph 4.

References:

- ICAO ANNEX II — *10th edition*
- PANS/ATM (Doc. 4444) – *15th edition*
- State Letter AN 1311 1.6-04185– *Revised Guidelines for SLOP*
- Separation and Airspace Safety Panel (SASP)– *Twelfth WGWH Summary of Discussions and Conclusions*
- Separation and Airspace Safety Panel (SASP)– *Draft thirteenth Summary of Discussions and Conclusions*

1.1 INTRODUCTION

1.1 More than twenty years ago IFALPA recognised the inherent risk of a collision between aircraft as the result of highly accurate navigation systems, and has been working very close with ICAO developing appropriate procedures to promote the use of lateral offset tracking procedures. This becomes more relevant as time goes by because navigation systems of extreme accuracy such as GNSS are increasingly becoming standard on all types of aircraft.

1.2 On August 27 2004, following two previous State letters on the subject, ICAO published a State letter with revised guidelines on the use of strategic lateral offsets (AN 1311 1.6-04185). Unfortunately very few States have authorized SLOP in remote continental and oceanic airspace as recommended in PANS/ATM (Doc 4444) Chapter 15 para 15.2.4. Perhaps one of the reasons for this is precisely that SLOP is in a Chapter titled *"Procedures related to Emergencies, Communication Failure and Contingencies"*. For this reason there is an internal ICAO Working Paper suggesting to the Air Navigation Commission to move it to Chapter 16 *"Miscellaneous Procedures"*.

1.3 Annex 2 - **Rules of the Air**, Chapter 3, paragraph 3.6.2.1.1, reads: *"Unless otherwise authorized or directed by the appropriate air traffic control unit, controlled flights shall, in so far as practicable:*

a) when on an established ATS route, operate along the defined centre line of that route; or
b) when on any other route, operate directly between the navigation facilities and/or points defining that route".

1.4 PANS/ATM para. 15.2.4.1 reads *"The following shall be taken into account by the appropriate ATS authority when authorizing the use of strategic lateral offsets in a particular airspace:*

a) strategic lateral offsets shall only be authorized in en-route oceanic or remote continental airspace. Where part of the airspace in question is provided with an ATS surveillance service, transiting aircraft should normally be allowed to initiate or continue offset tracking;

1.5 On August 2004, the Air Navigation Commission approved the circulation of guidelines to States and international organizations with SLOP implementation considerations as follows:

1.5.1 Section 5 reads. *"As it is desirable that offset procedures be standardized to the maximum extent possible, in order to reduce the likelihood of pilots inadvertently applying procedures different from those specified for the airspace in which they are operating, it is recommended that these strategic lateral offset procedures be implemented on a regional basis, after coordination among all States involved. Action should also be taken to incorporate the procedures and details of the airspace where the procedures will be applied in the Regional Supplementary Procedures (Doc 7030)"*.

1.5.2 Section 3 reads **For ATS Authorities:**
The following considerations shall be taken into account when planning authorization of the use of strategic lateral offsets in a particular airspace:

a) strategic lateral offsets shall only be authorized in en-route oceanic or remote continental airspace. Where part of the airspace in question is within radar coverage, transiting aircraft should normally be allowed to initiate or continue offset tracking;

b) strategic lateral offsets may be authorized for the following types of routes (including where routes or route systems intersect):
   1) uni-directional and bi-directional routes; and
   2) parallel route systems where the spacing between route centre lines is not less than 55.5km (30 NM);

c) in some instances it may be necessary to impose restrictions on the use of strategic lateral offsets, e.g. where their application may be inappropriate for reasons related to obstacle clearance;

d) these offset procedures should be implemented on a regional basis after coordination between all States involved;

e) the routes or airspace where application of strategic lateral offsets is authorized, and the procedures to be followed by pilots, shall be promulgated in aeronautical information publications (AIPs); and

f) air traffic controllers shall be made aware of the airspace within which strategic lateral offsets are authorized.

1.5.3 Section 4 reads **Lateral Offset Procedures to be Applied By Pilots**

In the application of strategic lateral offsets, pilots should take the following points into Consideration:

a) offsets shall only be applied in airspace where this has been approved by the appropriate ATS authority;

b) offsets shall be applied only by aircraft with automatic offset tracking capability;

c) the decision to apply a strategic lateral offset is the responsibility of the flight crew;

d) the offset shall be established at a distance of **one or two nautical miles to the right of the centre line** relative to the direction of flight;

e) the strategic lateral offset procedure has been designed to include offsets to mitigate the effects of wake turbulence of preceding aircraft. If wake turbulence needs to be avoided, one of the three available options (centreline, 1 NM or 2 NM right offset) shall be used;

f) in airspace where the use of lateral offsets has been authorized, pilots are not required to inform air traffic control (ATC) that an offset is being applied; and

g) aircraft transiting areas of radar coverage in airspace where offset tracking is permitted may initiate or continue an offset.

2. DISCUSSION

2.1 The use of highly accurate navigation systems (such as the global navigation satellite system (GNSS)) by an increasing proportion of the aircraft population has had the effect of reducing the magnitude of lateral deviations from the route centre line and, consequently, increasing the probability of a collision, should a loss of vertical separation between aircraft on the same route occur. The First Mid-Air Collision on record is on October 2, 1910 near Milan, Italy whilst SLOP probably may not have prevented it, the same is not true of others such as on November 1996 when an Ilyushin-96 and a B747 collided near New Delhi or September 2006 when a B737 was hit by an Embraer Legacy and crashed into the Brazilian airspace.

2.2 Annex 2 requires aircraft to fly “on centreline”. Before high precision navigation systems became available this was not an issue. Although ICAO has encouraged SLOP, no broad implementation has occurred perhaps because the title of PANS/ATM Chapter 15 where the procedure is published reads *“Procedures related to Emergencies, Communication Failure and Contingencies”* thus discouraging Air Navigation Service Providers (ANSP) and State Regulators.

2.3 Aware of the above amongst other things, the ICAO Secretariat has developed a Working Paper for the Air Navigation Commission, to consider re-locating the current SLOP text to Chapter 16 *“Miscellaneous Procedures”*. Thus making it the norm rather than the exception. A State letter should soon be circulated to States on the subject.

2.4 Regardless of the above the CAR/SAM would benefit greatly by adopting the ICAO Strategic Lateral Offset Procedure in Remote Continental and Oceanic Airspace on a Regional basis.

2.5 Some States (i.e. China) have interpreted oceanic or remote continental airspace in PANS/ATM 15.2.4.1, a), as that airspace where there is no radar coverage. IFALPA believes that the same could be applied to the CAR/SAM Region.

2.6 In its work on developing the SLOP, the SASP had recognized the benefit of implementing SLOP in non-oceanic airspace, but had difficulty in defining suitable airspace. As a compromise, the term "remote continental" was adopted, which is deliberately vague and undefined to allow States and regions to investigate the suitability of its airspace. The current SLOP might create a problem with lateral separation in parallel route systems with spacings of less then 30 nautical miles. These were not studied by SASP in its work. In general it can be expected that the lateral risk would increase a certain amount, while the vertical risk would considerably decrease with the introduction of SLOP.

2.7 Where electronic means of surveillance (e.g. radar) are employed, SLOP could create a problem for air traffic controllers if pilots move unexpectedly up to two miles away from their route centreline. As this could result in unacceptably increased controller workload, especially in areas with high traffic density, the SASP needed to make sure that SLOP is not employed in such airspace.

2.8 On the other hand the term "Where part of the airspace in question is within radar coverage, transiting aircraft should normally be allowed to initiate or continue offset tracking" indicates that SASP did investigate the effect of SLOP in such circumstances and found that there is no noticeable increase in horizontal risk to be expected under such circumstances, while SLOP considerably reduces the (vertical) risk for cases where vertical separation is not correctly established or lost.

3. CONCLUSION

3.1 In accordance with the ICAO revised SLOP guidelines [1.5.2 c) above] and in line with the work on going in ICAO, the CAR/SAM Region would benefit greatly by adopting/implementing SLOP on a Regional basis and having States publish only the areas where it is necessary to restrict it.

3.2 Action should also be taken to incorporate the procedures and details of the airspace where the procedures will be applied in the Regional Supplementary Procedures (Doc 7030).

3.3 If the meeting is in concurrence, it may adopt the following draft conclusions:

Draft Conclusion 6/X Recognizing that ICAO Strategic lateral Offset Procedures (SLOP) are now mature and considering the Safety enhancements that SLOP can bring to the CAR/SAM Region, take action to incorporate in the Regional Supplementary Procedures (Doc 7030) Document, the details of the airspace where the procedures published in PANS/ATM (Doc. 4444) can be applied.

Draft Conclusion 6/X Define in Doc 7030 for the purpose of SLOP, Oceanic and Remote Continental Airspace as that airspace where there is no radar coverage.

Draft Conclusion 6/X Encourage States that may have restrictions on the use of SLOP, to identify the airspace on the national AIP (e.g. where their application may be inappropriate for reasons related to obstacle clearance),

4. ACTION BY THE MEETING

4.1 The Meeting is invited to:

a) note the information provided in this working paper;

b) recognize the Safety enhancements that SLOP can bring to the CAR/SAM Region; and

c) consider adopting the proposed draft conclusions.

- END -