



**The Twenty first Meeting of the Informal South Pacific ATS Coordinating Group  
(ISPACG/21)**

Auckland, NZ, 5 March – 9 March 2007

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Agenda Item 4: Review progress on open action items  
AI 16-6

**Strategic Laterally Offset Tracks**

**(Presented by Airbus)**

**SUMMARY**

Very accurate navigation systems have lead to an increased risk of one type of mid-air collision. Two such head-on collisions are now believed to have occurred to airliners. Three airliners were destroyed. Existing recommended procedural track offset safety mitigations are not working, and are unlikely to work in the future. It is recommended that the charts and AIPs be amended so as to laterally offset opposite-direction tracks, so as to dependably mitigate this risk.

**1. GPS & RVSM safety improvements have a downside**

With the widespread use of RVSM-compliant aircraft, that also use GPS as the usual en-route source of horizontal navigation, navigation accuracy has improved to the extent that the altimetry errors are usually comparable with the airframe height, and horizontal errors are usually less than half the wingspan. This improvement has enabled generally better safety and operations.

In previous operations, when aircraft were inadvertently operating co-altitude and on reciprocal tracks, and other means of ensuring safety were not available, the large errors meant that aircraft would usually miss each other when at the closest point of approach. However, with today's improved navigation accuracies, aircraft will often collide, in such circumstances.

**2. At least two collisions have occurred**

There are at least two airliner collisions where this appears to have occurred.

- The first one involved two small twin-engine propeller airliners in Canada on 1 May 1995, with both aircraft destroyed. Both aircraft were likely to have been using GPS. Transportation Safety Board of Canada Report Number A95H00008 refers.

- The second one involved a new GOL B737-800 and a new Embraer Legacy business jet (an EMB-135 derivative) in Brazil on 29 September 2006. The B737 was destroyed, and the accident investigation is ongoing. Both aircraft were RVSM-approved and had FMSs that use GPS.

### **3. Recommended Lateral Offset Procedures do not work**

The Canadian regulator, Transport Canada, recommended that aircrews fly 1-2 miles right of track.

In the North Atlantic MNPS Ops Manual, this risk has been acknowledged, and Strategic Lateral Offset Procedures (SLOP) are recommended, but are reported not often used by the aircrews. They recommend flying up to 2 miles right of track.

In the author's view, the reasons for SLOP crew procedures not working are deep-seated, so we should not rely on them.

### **4. Strategically Laterally Offset Tracks**

It is proposed that the charts and other AIPs be amended, to ask for offset opposite-direction tracks by a minimum of 90<sup>1</sup> metres and a maximum of one mile to the right, or half the applicable RNP, whichever is the less, to mitigate the new collision risk on published airways

The advantage of doing the job in the charts and other AIPs would be that all aircraft in the airspace concerned would fly offset, and that the offset would not be applied on the tracks where it is inapplicable or dangerous, such as on most final approaches.

### **5. Conclusion**

The group is asked to note the questions raised in this paper and to propose a consensual position. Widespread GPS use has improved aviation safety, but has also increased the risk of head-on collisions, because aircraft now navigate extremely accurately. Two such collisions appear to have occurred within 11 years, resulting in the loss of three airliners.

The existing risk mitigation uses a recommended aircrew procedure, and is ineffective because it is not used. It is believed that the industry cannot rely on such aircrew procedures.

It is proposed that the risk be mitigated dependably, by laterally offsetting opposite-direction tracks, in the charts and other AIPs.

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<sup>1</sup> ICAO Code F covers aircraft between 65 metres and less than, but not including, 80 metres wingspan. The largest aircraft flown to date have wingspans of just under 90 metres, including the Antonov An-225 and Hughes HK-1 Spruce Goose