Thirty Eighth Meeting of the
Informal South Pacific ATS Coordinating Group
(ISPACG/38)

Santiago, Chile
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Agenda Item X: UPR Expansion- AirServices Australia

User Preferred Route Expansion

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SUMMARY

This information paper will describe the ongoing expansion of UPR's in Australian administered airspace and discuss some of the emerging challenges associated with a rapid increase in use of UPR's in the South Pacific region.

1.   INTRODUCTION

1.1   User Preferred Routes (UPRs) provide airlines with the ability to flight plan unique flight paths for each aircraft. This allows each flight to operate on the most cost-effective, fuel efficient and timely routes.

1.2   Prior to 2020 UPRs in the Brisbane FIR were restricted to limited portions of low-density Oceanic airspace and primarily only available to long-haul flights.

1.3   UPR airspace has now been significantly expanded with all class A airspace being declared UPR airspace with time activated UPR exclusion zones established in high density areas. Many long-haul flights can now operate on UPR's for the entirety of their route within Australian administered airspace and there is an increasing uptake of UPR usage for short haul international flights.

1.4   Flex tracks are no longer in use – they used to provide limited opportunity for specific airlines to propose routes daily for long haul flights that could then be flown by others if they chose. This wasn't optimal as a route planned for a A380 to maximise efficiency likely won't be the same as a B787.

1.5   The UPR exclusion zones protect the integrity of fixed air route structures around major airports during peak periods whilst maximising airspace available for UPRs.

1.6   City Pair constraints were also removed from the off-air routes planning manual, meaning airlines may now UPR between any two ports.

1.7   During off-peak periods most long-haul flights are now able to operate on a UPR for the entirety of their flight through Australian administered airspace.

1.8   There has been a consistent increase in the use of UPR's as international traffic has returned with many airlines now also operating UPR's for shorter international flights. Many Trans-Tasman and Pacific Island flights are now operating on UPRs that vary each day with wind and weather conditions.

1.9   Restrictions on arriving aircraft have been minimised as much as possible. The point at which arriving aircraft are required to join the fixed route structure has been moved much closer to their arrival destination. For aircraft arriving to Australia via the Oceanic airspace this is often as close as the Feeder Fix point.

1.10   An airline which started flying UPRs between Perth and Cairns instead of using the fixed routes they've previously been limited too has on average been saving 400kg of Jet A1 fuel per return trip (PH-CS-PH).

1.10.1   According to industry standards, burning 1kg of Jet A1 in a combustion engine produces 3.16kg of CO_2, therefore they're now producing 1,264kg less CO_2 for each return flight on average. A mature tree on average will absorb approximately 22kg of CO_2 per year meaning the reduction in CO_2 due to UPR's for this one route equates to the work of approximately 20,970 trees over the course of a year.

2.   DISCUSSION

2.1   Controller Experience

Workload has become more variable and unpredictable. Controller workload is increasingly tied to environmental factors such as Jetstream and large areas of weather. Without the strategic separation provided by a fixed route structure conflicts will occur anywhere and on days where those factors dictate that operators want to be in smaller corridors this significantly increases complexity and workload. Similarly, there can be very low workload periods where UPR's between different city pairs are naturally separated. This requires controllers and supervisors to be more aware of future workload and consider sector configurations and staffing specific to the days traffic. Use of standard levels is also becoming increasingly important to provide some level on strategic separation. We would historically use race-track patterns or have routes that only had one way traffic at certain times of day where using non-standard levels was common and maximised efficiency. With more UPR's this layer of strategic separation is removed and particularly during peak periods use of standard levels only is becoming a necessity.

2.2   Simple Rulesets

Specific and complex rules are difficult to implement and provide minimal advantage as more operators fly UPRs.   When there were only a small number of operators utilising UPRs some restrictive planning rules e.g. no hemstitching or limiting UPRs near specific routes allowed the strategic separation of the traditional route structure to remain intact while providing some flexibility. Initially with the expansion of UPRs some of these rules were carried across but as more operators utilise UPRs there is less strategic separation provided by the route structure and enabling the most flexible approach to planning provides more 'natural' separation and more options for the ATC. As well as giving operators more options, if the ruleset is easier to understand it significantly improves compliance with ruleset which in turn reduces the need for controller intervention.

2.3   **AIDC**

The rate of failure of AIDC messages, in particular ABI's has increased in our experience as more UPR's are operating cross boundary.   Some causes of this are waypoints in flight plans that may not be 'known' to all FIR's and routes that aren't compatible with different ATC systems e.g. a limitation in Australia is that segments over 600nm will be rejected. Communication and information sharing between ANSPs when this occurs will help to identify the specific issues and make sure the current rulesets are compatible with all impacted stakeholders.

2.4 **Future improvements**

Continuing to refine and simplify the UPR ruleset in consultation with airspace users and neighbouring ANSPS to maximise gains in efficiency and achieve a consistent approach throughout the region.   A trial of UPR's across the Australia Indonesia boundary will be commencing in the near future which represents a meaningful step in tat direction. Future improvements within Australian airspace will include the introduction direct route segments crossing the current exclusion zones where possible to provide a link between the Oceanic and contiguous UPR airspace and create more viable UPR options for overflights.

3.   **ACTION BY THE MEETING**

3.1   The meeting is invited to note the information provided.

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