Twenty Ninth Meeting of the
Informal South Pacific ATS Co-ordinating Group
(ISPACG/29)

Santiago, Chile
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Agenda Item [*6.7*]

RNP2/GNSS Lateral Separation

Presented by Federal Aviation Administration (FAA)

SUMMARY
This paper discusses the potential for operational use of ICAO Doc 4444 RNP2/GNSS lateral separation standards.

1. INTRODUCTION

1.1 On November 13, 2014 the 15th Edition, 6th amendment of ICAO Doc 4444 became effective. New RNP 2/GNSS separation standards were created by the 6th amendment. These separation standards are defined in paragraph 5.4.1.2.1.6:

5.4.1.2.1.6 Lateral separation of aircraft on parallel or non-intersecting tracks or ATS routes. Within designated airspace or on designated routes, lateral separation between aircraft operating on parallel or non-intersecting tracks or ATS routes shall be established in accordance with the following:

a) for a minimum spacing between tracks of 93 km (50 NM) a navigational performance of RNAV 10 (RNP 10), RNP 4 or RNP 2 shall be prescribed;

b) for a minimum spacing between tracks of 55.5 km (30 NM) a navigational performance of RNP 4 or RNP 2 shall be prescribed;

c) for a minimum spacing between tracks of 27.8 km (15 NM) a navigational performance of RNP 2 or a GNSS equipage shall be prescribed. Direct controller-pilot VHF voice communication shall be maintained while such separation is applied;

d) for a minimum spacing between tracks of 13 km (7 NM), applied while one aircraft climbs/descends through the level of another aircraft, a navigational performance of RNP 2 or a GNSS equipage shall be prescribed. Direct controller-pilot VHF voice communication shall be maintained while such separation is applied; and

e) for a minimum spacing between tracks of 37 km (20 NM), applied while one aircraft climbs/descends through the level of another aircraft whilst using other types of communication than specified in d) above, a navigational performance of RNP 2 or a GNSS equipage shall be prescribed.

1.2 Paragraphs 5.4.1.2.1.6.c) and d) require direct controller-pilot VHF communication, which is not available in the Oakland Oceanic FIR. Paragraph 5.4.1.2.1.6.e provides a new 20nm lateral separation standard which is most applicable in Oceanic airspaces.

2. DISCUSSION

2.1 Paragraph 5.4.1.2.1.6.e requires RNP 2 or a GNSS equipage for the separation to be applied. Upon review of the flight planned equipage in the Oakland Oceanic FIR, it was found that 95% of the flight plans contained a "G" in field 10a of the FPL. With such a high level of equipage, it is likely that aircraft would be properly equipped if the traffic scenario presented itself for application. Additionally there would not be a requirement for aircraft to invest in new capabilities to be eligible for the separation standard.

2.2 In 2014, KZAK received almost 270 thousand altitude change requests. In the Oakland Oceanic FIR, an average of 82.6% of aircraft are cleared to their requested altitude under the current conditions. That leaves a potential 17.4% of aircraft that might benefit from a GNSS 20nm lateral climb/descent through blocking traffic. The FAA selected January 3, 2015 to manually review the instances where aircraft were denied their requested altitude. January 3, 2015 had a large number of vertical clearance requests that were denied due to traffic. 229 cases were carefully reviewed to see if they met the criteria in Paragraph 5.4.1.2.1.6.e and could have been granted their request. The analysis showed that 7.86% of the requests could have been approved using GNSS 20nm lateral separation.

2.3 While recognizing that this the study was a small data collection and could be prone to variations, the following conclusions were reached. In 2014, Oakland ARTCC denied around 46,476 vertical change requests. If the study rate of 7.86% application rate was applied to the number of 2014 unable advisories, that would lead to 3653 possible applications of the GNSS 20nm lateral climb/descend through traffic rule.

2.4 The traffic study for January 3, 2014 only looked at the actual traffic scenarios. There are two other applications of the rule that it is felt could provide greatly increase efficiency that were not accounted for.

2.4.1 The use of lateral offsets to climb an aircraft through blocking traffic could provide an operational advantage to Oceanic Control. About 60% of aircraft in the Oakland FIR are FANS/RNP4 equipped. Between two FANS/RNP4 aircraft it is possible to offset an aircraft 30nm from route centerline and climb through blocking traffic. If one of the aircraft is RNP10, then the offset distance increases to 50nm. With the GNSS 20nm climb/descend through lateral rule, aircraft would have to fly less distance to offset to get a higher altitude and the separation standard would be available to 95% of the aircraft in the Oakland FIR. 20nm offsets become very beneficial in route structures such as the CEP, PACOTS or NOPAC where busy routes are 50 to 60nm laterally spaced. As long as the starting altitude and destination altitude are clear on both tracks, aircraft could be offset between two routes and climbed through traffic on both routes. The January 3, 2015 traffic study does not include the benefits that could be obtained from a 20nm offset procedure.

2.4.2 The use of GNSS 20nm lateral for island arrivals and departures to climb/descend through the altitudes of each other would provide a significant benefit to island arrivals and departures. In the Oakland FIR, ATC control services are provided to several small Pacific Island Airports. In order to facilitate arrivals and departures, when opposite direction traffic situations develop, the arriving aircraft and the departing aircraft are both offset 25nm to

provide 50nm lateral separation. In order for this procedure to work, the departure must call for clearance early enough to offset the arrival. With the 20nm GNSS lateral separation procedure, only the departure has to be offset to apply the rule. Benefits of the GNSS 20nm lateral climb/descend through traffic rule would be reduced miles flown and reduction in departure delays.

2.5 The FAA Oceanic Separation Reduction Work Group (OSRWG) assesses, prioritizes and recommends changes to oceanic separation standards and other improvements to oceanic safety, efficiency and capacity. OSRWG will take into consideration the data submitted by Oakland ARTCC and conduct analysis to evaluate the GNSS/RNP-2 climb/descend procedure for implementation in the oceanic airspace which FAA provides service.

3. ACTION BY THE MEETING

3.1 The meeting is requested to:

a) Note the provided information.