

**Thirty-Seventh Meeting of the  
Informal South Pacific ATS Co-ordinating Group  
(ISPACG/37)**

**State Civil Aviation Service in French Polynesia  
April 27, 2023**

Agenda Item 4: Information Papers

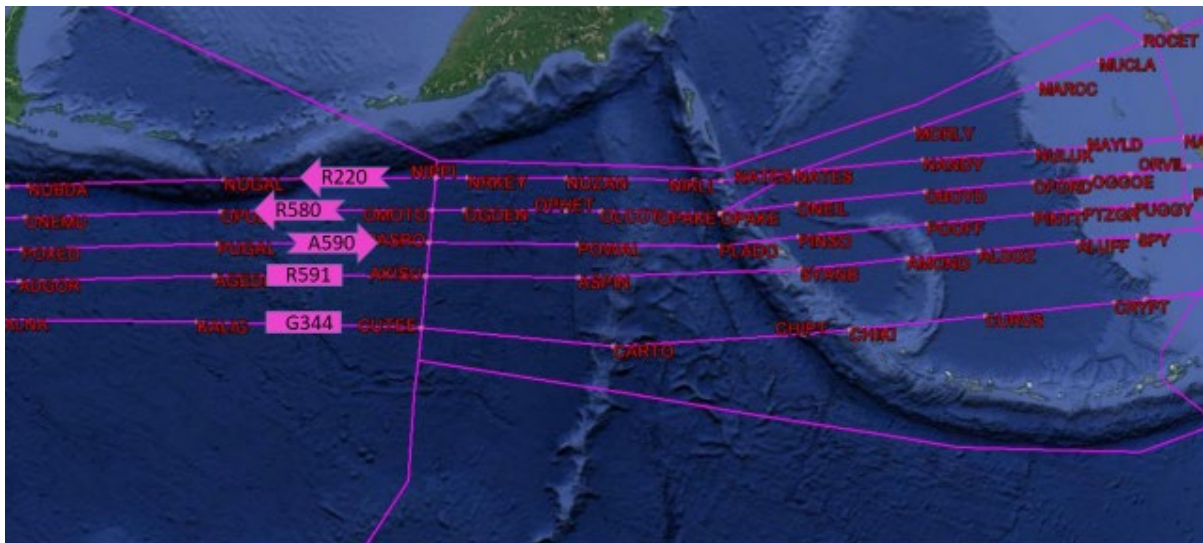
**North Pacific (NOPAC) Route System Redesign**

**Presented by FAA**

**SUMMARY**  
This paper provides an update on the effort to revise the NOPAC Routes and improve airspace efficiency.

**1. INTRODUCTION**

1.1. When the NOPAC route system was initially created in 1974, standard oceanic separation was 100 NM lateral, 20 minutes longitudinal and 2000 feet vertical. The NOPAC route system is comprised of 5 parallel routes that were spaced laterally by at least 50 NM between the routes. Composite separation (½ lateral and ½ vertical) was applied between the aircraft. This allowed for the efficient movement of the NOPAC aircraft through a compressed amount of airspace. Subsequent improvements in aircraft capabilities (RNP10/RNAV10 and RVSM) allowed standard oceanic separation to be reduced to 50 NM laterally and 1000 feet vertically. These changes greatly increased the capacity of the NOPAC Route System. The NOPAC Route System has remained basically the same as originally published (see Figure 1), a series of 5 parallel routes that cross the Fukuoka/Anchorage Oceanic common FIR boundary until this year.



**Figure 1. Original NOPAC Route System**

1.2. In November 2016, ICAO published a new 23 NM lateral separation minimum, which requires RNP4, RSP180 and RCP240. The NOPAC Route System has a high level of FANS 1/A equipped aircraft which could be capable of supporting the 23 NM PBCS lateral minima. Over 99 percent of NOPAC aircraft crossing the Anchorage/Fukuoka FIR boundary have obtained RNP4 approval, but about 7 percent of NOPAC FANS 1/A aircraft have not yet obtained their RCP240/RSP180 approvals which are required to apply the 23 NM PBCS lateral minima. For the purposes of this paper, “PBCS approved” means the aircraft is RCP240 and RSP180 approved.

1.3. JCAB and the FAA have been working with IATA and the operators through IPACG to develop a Phased Implementation plan for 23 NM laterally spaced NOPAC routes. This paper provides details on the progress of the NOPAC Redesign Project.

## 2. DISCUSSION

2.1 NOPAC Redesign Phase 1a began on December 2, 2021. In Phase 1a ATS Route R220 required RNP4, RSP180 and RCP240 PBCS approvals from FL340 through FL400. The initial R220 PBCS/RNP4 restrictions were established to provide for operator education on the NOPAC Redesign project, get operators familiar with flight planning through NOPAC when their aircraft were not PBCS/RNP4 approved, and prepare operators for the future Phases of the project. In Phase 1a, controllers did not enforce the R220 PBCS and RNP4 requirements. The FAA and JCAB conducted post flight evaluations to identify operators that did not comply with the R220 PBCS/RNP4 requirements or transit the NOPAC routes without PBCS and/or RNP4 approvals. Non-compliant or non-approved operators were contacted to make sure the operator understood the PBCS/RNP4 requirements and was aware of the NOPAC Redesign project and future Phase requirements. The goal of Phase 1a to increase the percentage of PBCS approved aircraft operating in NOPAC was successful. The percentage of PBCS and RNP4 approved aircraft increased from around 84 percent to over 92 percent.

2.2 Phase 1b began on February 23, 2023. The two southernmost NOPAC ATS Routes, G344 and R591 were deleted except for a short segment of R591 on the eastern end that is used for the application of 15 degrees diverging track separation. All the waypoints on deleted G344 and R591 were retained as significant waypoints for PACOTS and UPR flight planning. Controllers are beginning limited enforcement of the R220 PBCS/RNP4 requirements, as they are able. Non PBCS/RNP4 approved aircraft on R220 may fly at FL330 and below or FL410 and above. The other routing alternative for Non PBCS/RNP4 approved westbound aircraft in NOPAC is to flight plan via R580.

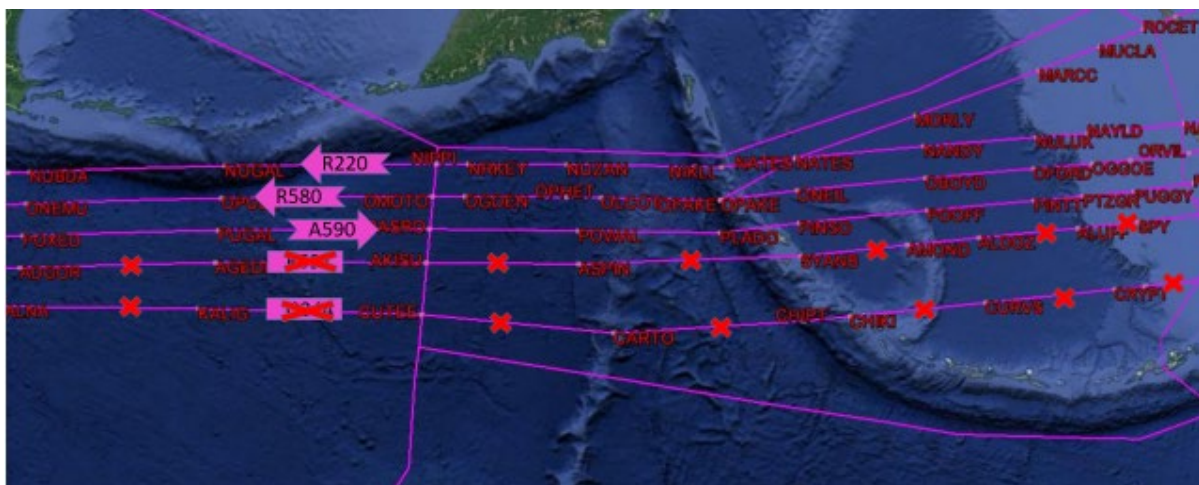


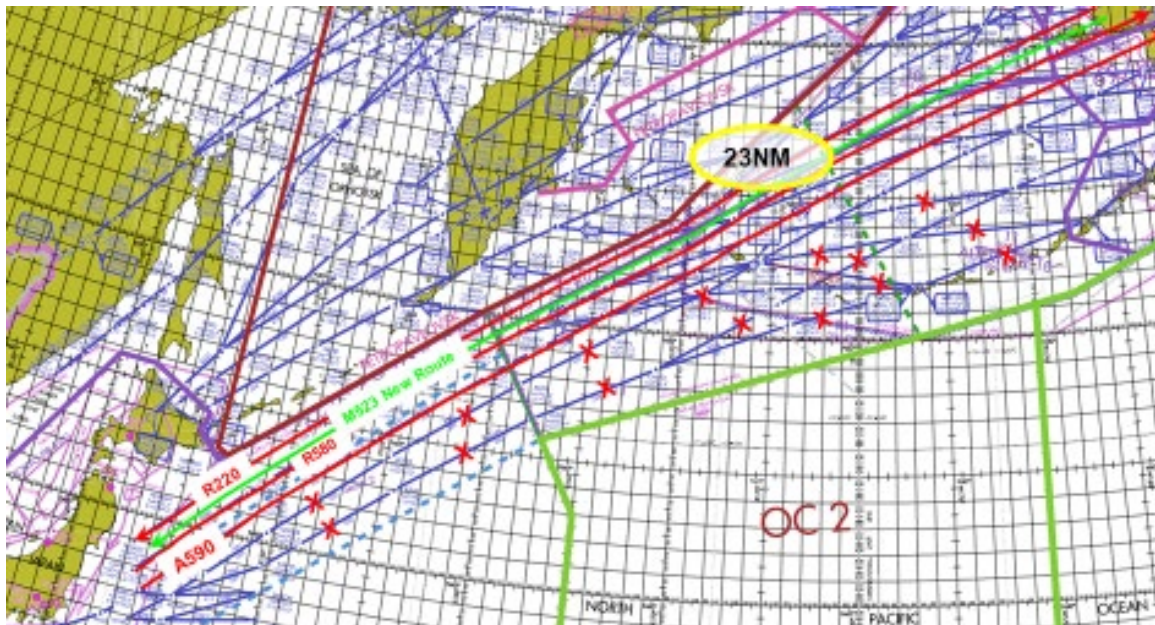
Figure 2. NOPAC Redesign Phase 1b

2.3 Phase 2 is tentatively planned to begin in December 2022 or January 2023. Phase 2 will introduce a new westbound ATS Route, named M523, which will be evenly spaced between the two northernmost NOPAC routes, R220 and R580. (See the green route in Figure 3). R220 remains a westbound route with PBCS/RNP4 approval required from FL340 to FL400.

2.3.1 M523 is a new westbound route open to PBCS/RNP4 aircraft from FL340 to FL400. M523 is closed to aircraft FL330 and below and FL410 and above. The reason for the closure to traffic at or below FL330 and at or above FL410 is because there may be non-PBCS/RNP4 approved traffic on the adjacent tracks R220 and R580 at those altitudes.

2.3.2 R580 changes to an eastbound route with PBCS/RNP4 approval required from FL340 to FL400.

2.3.3 A590 remains unchanged with no PBCS restrictions.



**Figure 3. NOPAC Redesign Phase 2**

2.4 Phase 3 will create a new eastbound ATS Route, named N507, which will be at least 25NM south of R580.

2.4.1 ATS Routes R220, M523 and R580 remain unchanged from Phase 2.

2.4.2 N507 is a new eastbound Phase 3 route open to PBCS/RNP4 aircraft from FL340 to FL400. N507 is closed to aircraft FL330 and below and FL410 and above.

2.4.3 A590 will be shortened until POXED but the waypoints that define A590 will be retained. Aircraft flying the waypoints of A590 will be required to have PBCS/RNP4 approval required from FL340 to FL400.

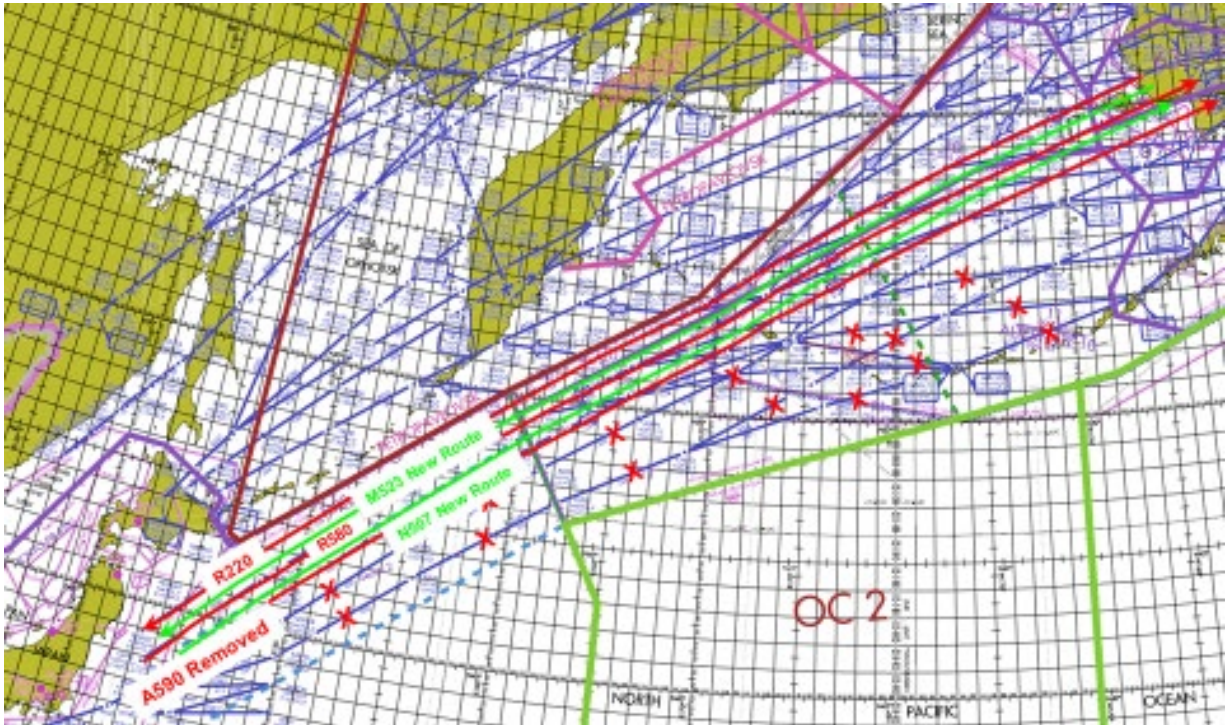


Figure 4. NOPAC Redesign Phase 3

2.5 When a PACOTS Track or UPRs utilize R220, M523, R580, N507 or the waypoints of the deleted A590, 25 NM south of N507, PBCS approvals are required from FL340 to FL400. Figure 5 shows a cross section of the Phase 3 NOPAC routes to illustrate the PBCS requirements and available altitudes on each of the Phase 3 routes.

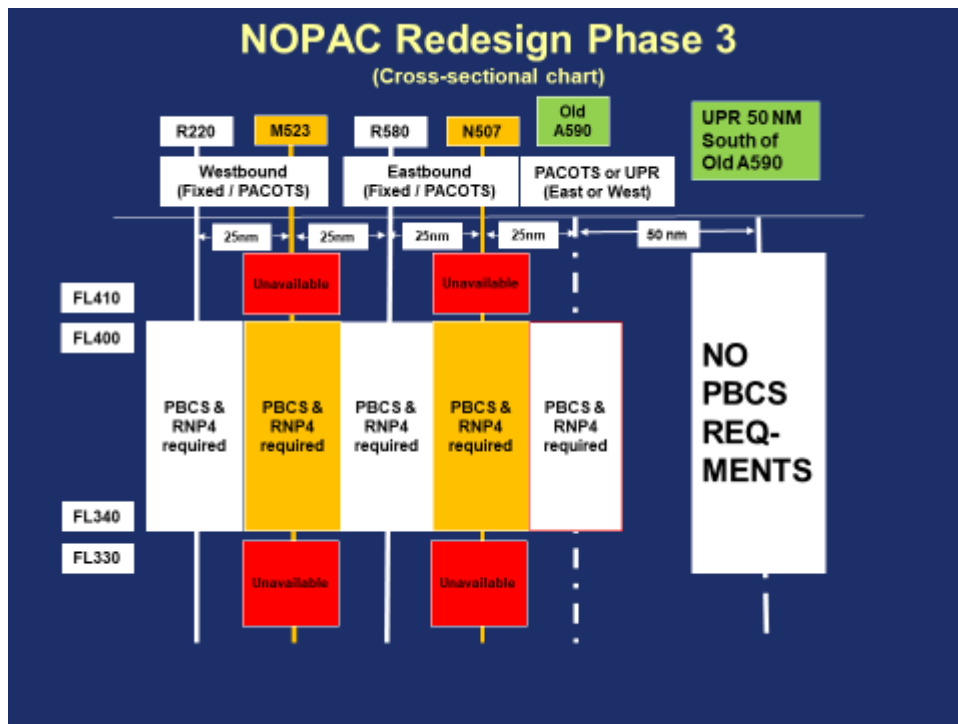


Figure 5. NOPAC Redesign Phase 3 Cross Sectional Chart

2.6 The 25 NM laterally spaced NOPAC Route Structure is not considered exclusionary routes/airspace. Non-PBCS/RNP4 approved aircraft will be accommodated at or below FL330 and at or above FL410 or south of the four NOPAC Phase 3 routes. IATA has expressed support for the proposed plan at the IPACG Meetings, but IATA does not represent all NOPAC users. The FAA collected data from the first half of 2019 and coordinated the NOPAC redesign plan with Non PBCS approved aircraft operators that were not IATA members. Most of these Non-IATA operators responded and have either obtained PBCS approvals or have plans to obtain the approvals for their aircraft. Efforts have continued over the past 3 years to reach out to Non-PBCS approved operators with more than 1 flight a month on the NOPAC routes and advise them of the NOPAC Redesign project so that they are prepared for the changes.

2.7 Phase 1a and 1b has helped to raise the level of PBCS approved operators to above the 90% level necessary to advance to Phase 2 and 3. With the start of Phase 1b on February 23, 2023, more airspace south of ATS Route A590 is opened for UPRs and flexible routes. The newly opened airspace south of A590 does not have any PBCS requirements. The NOPAC redesign is increasing overall airspace efficiency.

2.8 After implementation of Phase 3, the 4 NOPAC routes will have been compressed into less airspace than 3 routes previously occupied. The Phase 3 PBCS routes will allow for the efficient movement of large volumes of traffic through the NOPAC routes. A significant volume of airspace south of the Phase 3 NOPAC routes previously occupied by A590, R591 and G344 will be available for more efficient flexible PACOTS routes and UPRs. After implementation of Phase 3, the airspace will be monitored for any issues and procedural adjustments may be made when required. As the percentage of PBCS/RNP4 approved aircraft increases, adjustments may be made to increase the PBCS altitude stratum to improve efficiency.

### **3. CONCLUSION**

3.1 The meeting is invited to note the information provided.

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