



ASSEMBLY — 41ST SESSION

TECHNICAL COMMISSION

Agenda Item 30: Aviation Safety and Air Navigation Policy

30.2: Latest developments related to the Global Air Navigation Plan (GANP)

FURTHER ENHANCEMENT IN OPERATIONAL SYSTEMS TO REDUCE CO₂ EMISSIONS

(Presented by Japan)

EXECUTIVE SUMMARY

As an effort to reduce CO₂ emissions, Japan Civil Aviation Bureau (JCAB) plans to redesign NOPAC route system in collaboration with the United States, Federal Aviation Administration (FAA) and introduce offset climb/descent procedure and 12NM lateral separation minima into the oceanic airspace. These programs allow airspace users to reduce flight time and facilitate access to the optimum altitude.

<i>Strategic Objectives:</i>	This information paper relates to the Safety and Air Navigation Capacity and Efficiency Strategic Objectives.
<i>Financial implications:</i>	Not applicable
<i>References:</i>	Annex 16 — <i>Environmental Protection</i> Doc 4444, <i>Procedures for Air Navigation Services-Air Traffic Management</i>

1. INTRODUCTION

1.1 At the 37th Session of the ICAO Assembly in 2010, the global aspirational goal in international aviation of 2 per cent annual fuel efficiency improvement through 2050 and carbon neutral growth from 2020 onwards was adopted. Based on this goal, the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was adopted at the 39th Session of the ICAO Assembly in 2016, and ICAO Annex 16 — *Environmental Protection*, Volume IV — *Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)*, which stipulates Standards and Recommended Practices (SARPs) to implement CORSIA was adopted in 2018. In addition, based on the discussion at LTAG-TG in accordance with Assembly Resolution A40-18, long-term CO₂ emission goals in international aviation will be discussed at the 41st Session of the ICAO Assembly.

1.2 This information paper introduces Japan's operational activities to reduce CO₂ emissions in the oceanic airspace.

2. DISCUSSION

2.1 NOPAC route system redesign

2.1.1 NOPAC route system is the route system between Anchorage Oceanic flight information region (FIR) and Fukuoka FIR oceanic airspace. The oceanic airspace is an airspace that is not monitored by the ATS surveillance system and is not served by VHF voice communications services. A large number of aircraft flying between North America and Asia use this route system. Currently, the route system consists of 5 parallel routes that are spaced by at least 50NM between the routes and occupies airspace approximately 230NM wide as shown in Figure 1. Aircraft on adjacent routes are separated by 50NM lateral separation minima, which requires RNP10 operational approval.

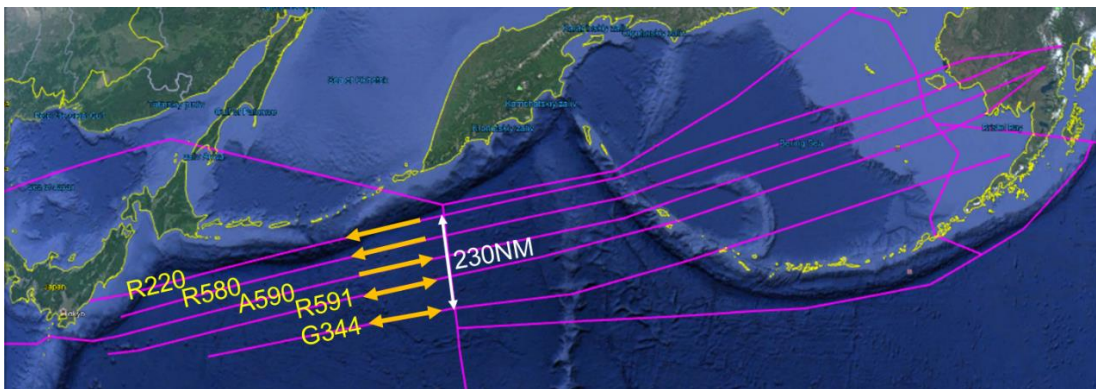


Figure 1. Current NOPAC route system

2.1.2 The FAA and JCAB have been working for the redesign of the NOPAC route system. The redesign is being progressed stepwise. The first phase of the redesign began in December 2021. The redesign will be completed over the next few years. At the end of the redesign, the NOPAC route system will be compressed into 4 parallel routes that are approximately 75NM wide as shown in Figure 2.

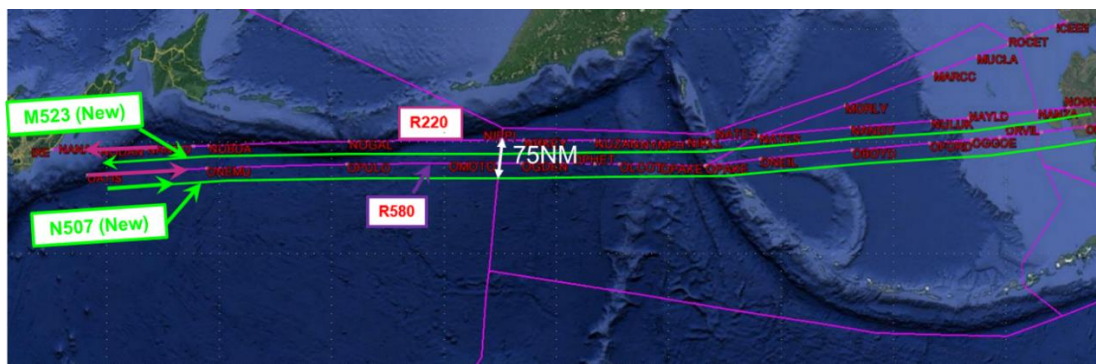


Figure 2. Final phase of NOPAC route system redesign

2.1.3 In the redesigned NOPAC route system, aircraft flying on adjacent routes will be separated from each other by 23NM lateral separation minima, which requires RNP4, RCP240 and RSP180 operational approvals. Therefore, the altitude stratum between FL340 and FL400 is only available for aircraft with these operational approvals. Additionally, new routes M523 and N507 are only available between FL340 and FL400 as shown in Figure 3.

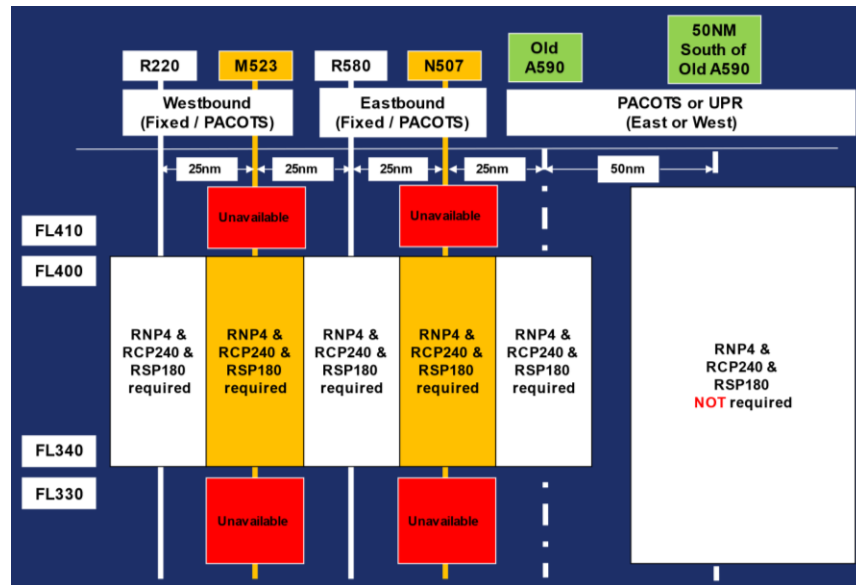


Figure 3. Sectional chart in the final phase of NOPAC route system redesign

2.1.4

The expected effects of the NOPAC route system redesign are:

- a) to expand airspace for the User Preferred Route (UPR) for flexibility of route planning by compressing NOPAC route system; and
- b) to bring each route of NOPAC route system closer to the great circle between North America and Asia; and
- c) to optimize airspace efficiency in an environment where aircraft of various performances are mixed.

2.1.5

With these effects, we believe that the NOPAC route system redesign can contribute to the reduction of CO2 emissions.

2.1.6

The FAA and JCAB will progress the redesign with the agreement from relevant parties, such as IATA and airline operators, through Informal Pacific ATC Co-ordinating Group (IPACG) meeting.

2.2

Offset climb/descent procedure in the oceanic airspace

2.2.1

JCAB has implemented various procedures to reduce separation minima in the oceanic airspace where ATS surveillance services are not available, such as the Automatic Dependent Surveillance-Contract (ADS-C) Climb and Descent Procedure (CDP), for increasing access to optimum altitude. However, there have still been some cases where aircraft could not access their optimum altitude because they were blocked by another aircraft.

2.2.2

Advances in technology have made it possible for new types of aircraft to fly at higher altitude, even when they are heavy shortly after departure. In a mixed environment of existing and emerging aircraft, it may be more difficult to access their optimum altitude.

2.2.3 JCAB will implement an offset climb/descent procedure and 12NM lateral separation minima for climbing/descending through the altitude of another aircraft in the oceanic airspace. These procedures allow the aircraft to climb/descend through the altitude of the blocking aircraft with 12NM offset, even though the longitudinal separation between the aircraft cannot be established.

2.2.4 The offset climb/descent procedure will facilitate access to the optimum altitude. The application of the 12NM lateral separation not only reduces the offset distance but also allows offset climb/descent for the aircraft even after the route spacing becomes 25NM due to the NOPAC route system redesign described in paragraph 2.1.

3. CONCLUSION

3.1 The expected effects of the NOPAC route system redesign are:

- a) to expand airspace for the User Preferred Route (UPR) for flexibility of route planning by compressing NOPAC route system;
- b) to bring each route of NOPAC route system closer to the great circle between North America and Asia; and
- c) to optimize airspace efficiency in an environment where aircraft of various performances are mixed.

3.2 The offset climb/descent procedure and 12NM lateral separation minima will facilitate aircraft to reach their optimum altitude.

3.3 With these effects, the NOPAC route system redesign and implementation of the offset climb/descent procedure and 12NM lateral separation minima can contribute to the reduction of CO2 emissions.

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