International Civil Aviation Organization

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English and Russian only[1]

WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 2: Aerodrome Operations – Improving Airport Performance
2.2: Performance-based navigation (PBN) – a practical way to improve airport performance with safety and efficiency

THE DEVELOPMENT AND IMPLEMENTATION OF DYNAMIC SEPARATION IN WAKE VORTEX

(Presented by the Interstate Aviation Committee)

SUMMARY

In this working paper the issue of increasing airspace capacity through the implementation of dynamic separation in wake vortex is considered.

Action: The Conference is invited to develop high-level Standards which could form the basis for the development of detailed State and industry technical standards.

1. INTRODUCTION

1.1 Wake vortex flight safety is provided through compliance with the rules for vertical and lateral vortex separation at different stages of flight. These rules prescribe aircraft flights with separations not less than the separations stipulated in the respective rules.

1.2 The transmission and receiving of wake turbulence data with its subsequent visual presentation on pilots' and controllers' monitors allow the implementation of dynamic separation in wake vortex which can increase airspace capacity and flight safety.

2. BACKGROUND

2.1 Entry into service of aircraft with increased wake turbulence requires the continuous review of existing ICAO categories and adoption of rules for wake vortex situational awareness in the terminal areas which take into account specific weather conditions.

[1] English and Russian translation provided by the Interstate Aviation Committee (IAC).

2.2 In order to prevent entering the dangerous wake vortex zone generated by the aircraft flying ahead, it is necessary to provide specified minimum separation. It is important to maintain the spatial-temporal intervals between departing and arriving aircraft in the runway terminal area.

2.3 Airport capacity, even if several runways are available, has its limit. In the expectation of the predicted doubling of air traffic volume it is necessary to find new solutions for increasing airspace capacity and handling the maximum number of aircraft.

2.4 After aircraft landing, it takes time for generated vortexes and turbulence zones to fade and shift to a safe distance. Holdover time (waiting period) depends on meteorological conditions, presence of transverse airstreams which carry the vortexes to adjacent runways, runway surface temperature, atmospheric turbulence, etc.

2.5 The vortex can be dangerous not only during aircraft take-off and landing but also during the flight when aircraft trajectories converge in 4D-space.

2.6 Modern communication, navigation and surveillance systems allow calculating upper wake turbulences, measuring weather parameters, transmitting and receiving data on vortexes and weather, and calculating dangerous areas. These achievements allow development and implementation of dynamic separation in the wake vortex environment.

2.7 Dynamic separation in wake vortex allows increasing the capacity of airports, zones and areas regardless of the number of utilized runways and types of aircraft in service.

2.8 Development of wake vortex flight safety has significant scientific potential which should be used as an evidentiary basis for principal decision-making.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to recommend that ICAO, within the framework of the Aviation System Block Upgrades (ASBUs), consider the possibility of speeding up the implementation of new ICAO wake vortex categories and establishing a working group in order to develop and implement dynamic separation in wake vortex as one of the most efficient methods of increasing the flight safety level and capacity of airports, zones and areas.

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