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THIRTEENTH AIR NAVIGATION CONFERENCE

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COMMITTEE A

Agenda Item 2: Enabling the global air navigation system
2.1: Aerodrome operations and capacity

RECATEGORIZATION OF WAKE VORTEX SEPARATION MINIMA IN JAPAN

(Presented by Japan)

EXECUTIVE SUMMARY

This paper presents the information about the implementation plan of reduced wake turbulence separation minima in Japan. The Japan Civil Aviation Bureau (JCAB) plans to introduce a 7-category wake turbulence separation minima into the Tokyo metropolitan airports by 2020. To realize further reduction of wake turbulence separation minima, JCAB is considering the introduction of the dynamic pairwise separation minima according to aircraft pairwise and weather conditions.

1. INTRODUCTION

1.1 Air traffic demand in Japan is expected to grow 2-3 per cent per year and this demand drives the need for runway throughput expansion particularly at the Tokyo metropolitan airports. In the long-term vision for the future air traffic systems of Japan, named "CARATS: Collaborative Actions for Renovation of Air Traffic Systems", the Japan Civil Aviation Bureau (JCAB) shows the implementation plan of reduced wake turbulence separation in accordance with ICAO's Global Air Navigation Plan (GANP, Doc 9750).

2. DISCUSSION

2.1 RECAT implementation plan in Japan

2.1.1 JCAB plans to introduce a 7-category wake turbulence separation minima, currently proposed by the ICAO Wake Turbulence Working Group (WTWG), into the Tokyo metropolitan airports by 2020. The new separation minima splits ICAO HEAVY and MEDIUM categories into two and three parts respectively, and includes SUPER and LIGHT categories.

2.1.2 To implement the new separation minima, JCAB is now conducting the safety case study including the risk evaluation of wake turbulence encounter and the benefit analysis in runway throughput. This study is closely supported by the Japanese research agencies including the Japan Aerospace

Exploration Agency (JAXA) and the Electronic Navigation Research Institute (ENRI). The Eurocontrol and the FAA also support this study by providing the materials about RECAT-EU and RECAT-US, respectively.

2.1.3 The Tokyo International Airport, which will be the first airport to introduce the new separation minima, requires two specific analysis. First, it requires to evaluate the wake decay characteristics over the sea surface because the departure/arrival traffic of Tokyo International Airport fly over the sea (Figure. 1). For this purpose, the JAXA and the ENRI has collected the wake decay data using lidars (Figures. 1, 2) and the safety of reduced separation is being evaluated by using the collected wake decay characteristics. Second, the benefit analysis in runway throughput needs to consider multiple runway operation dependency because the Tokyo International Airport has four runways partially crossing each other (Figure. 1). The JAXA and the ENRI are developing the dedicated benefit analysis model considering runway operation dependency and airport surface operation.

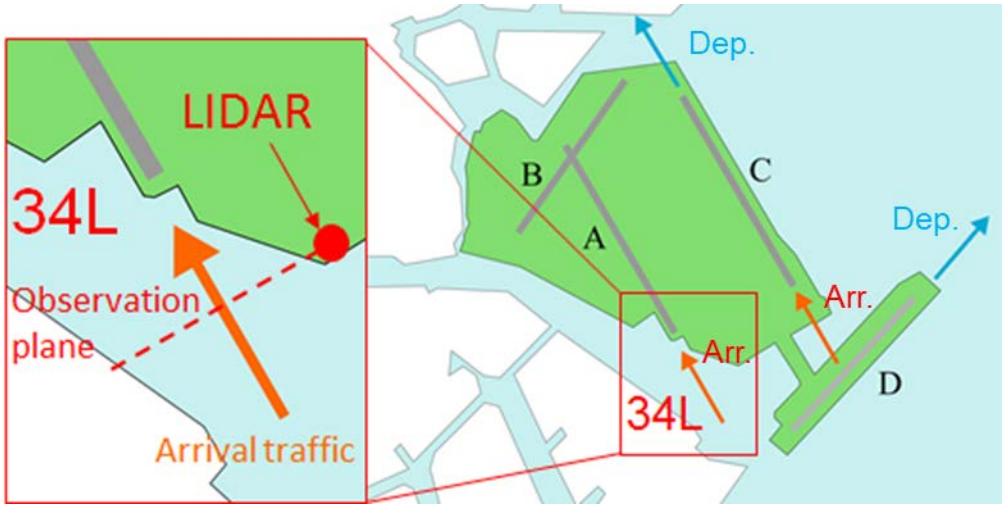

Figure 1. Runway operation of the Tokyo International Airport in northerly winds and lidar setup for wake turbulence observation.

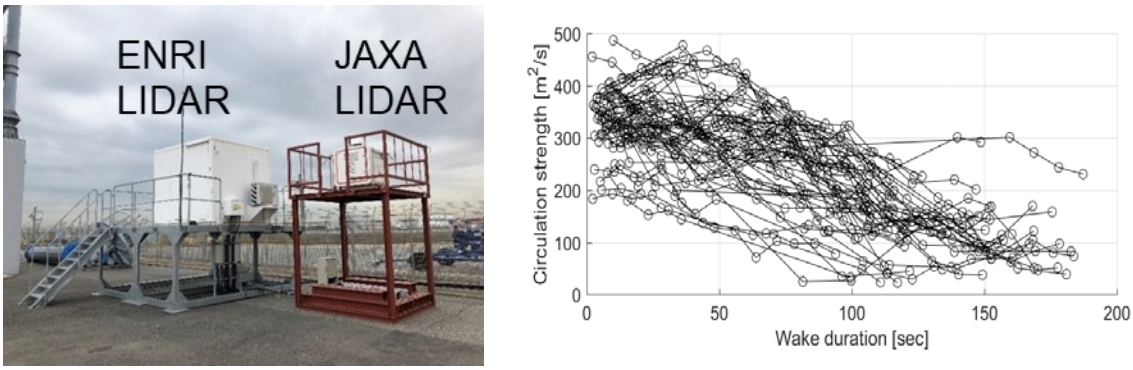

Figure 2. The JAXA and ENRI's lidars installed at Tokyo International Airport (left) and examples of observed wake circulation strength over the sea surface (right).

2.2 **Research activities towards dynamic pairwise separation**

2.2.1 To realize further reduction of wake turbulence separation minima, the JCAB is considering the introduction of the dynamic pairwise separation minima according to aircraft pairwise and weather conditions. For this purpose, the JAXA and the ENRI will conduct the related researches on the prediction of wake turbulence persistence on flight paths using real-time weather data and the safe separation assignment based

2.3 **Sharing information on knowledge of RECAT**

2.3.1 These research outcomes will be shared in the ICAO WTWG to support the standardization of the dynamic pairwise separation minima, including revisions of the PANS-ATM.

3. CONCLUSION

3.1 The meeting is invited to note the information contained in this paper.

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