Implementation of Enhanced Wake Turbulence Separation (eWTS) at Hong Kong International Airport

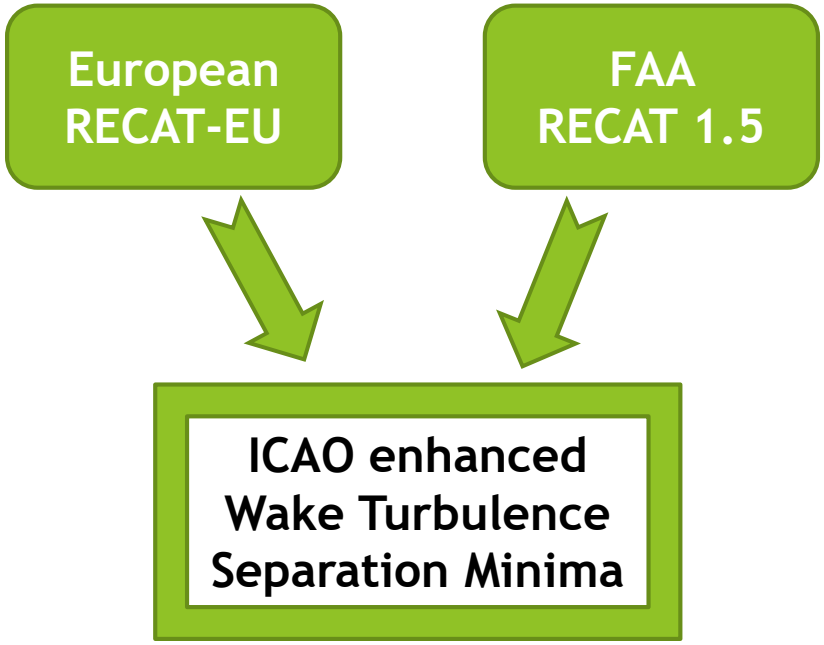
Hong Kong China
ATM/SG/9
01 – 05 Nov 2021

民航處
CIVIL AVIATION DEPARTMENT

Introduction

- Hong Kong Incremental Capacity Study findings – to Increase airport capacity and optimize runway throughput
  - Performance Based Capacity Declaration (PBCD)
  - Revised Wake Turbulence Separation Scheme
- Major development projects – construction of 3rd Runway, a new terminal and associated infrastructure
- European Wake Turbulence Categorisation and Separation Minima (RECAT-EU)
  - Project initiated in 2018
  - Consultant and a Project Team (CAD, AAHK & HKO)

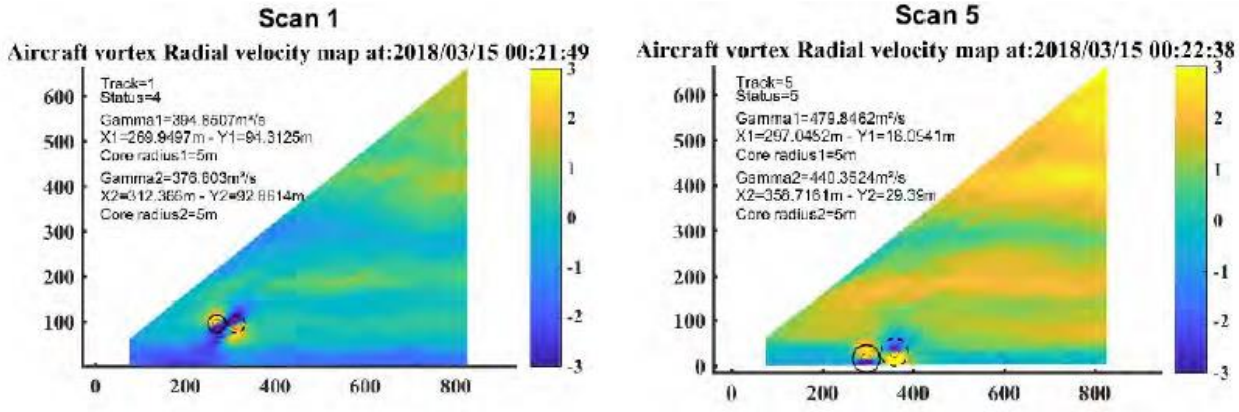
Project Development



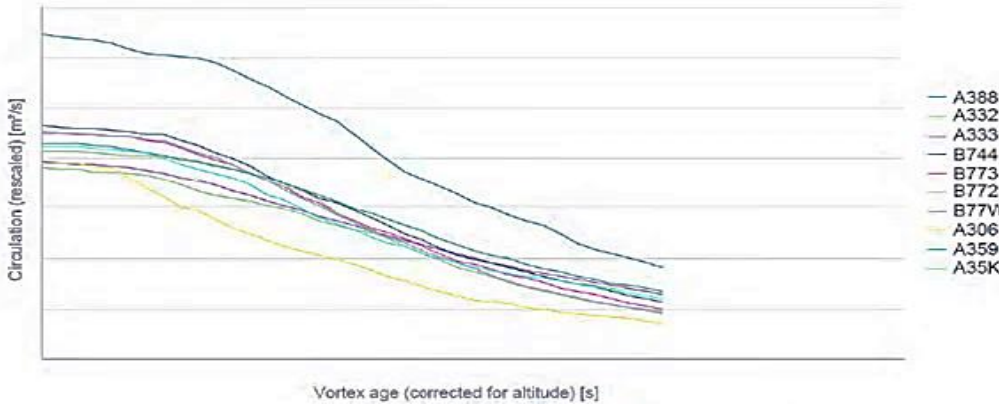
- Early 2020, Amendment 9 to Doc 4444 PANS-ATM
- Utilise 7 groups of aircraft based on maximum take-off weight, wingspan, wake generation characteristics and resilience to wake encounters
- SMS assessment on application of RECAT-EU vs ICAO eWTS
  - HKIA implemented ICAO eWTS for Arrivals on 5 November 2020 (amendment effective date)

Collection and Analysis of Data

- Collaboration between CAD, AAHK, HKO and airline operators to conduct a 12-month study
  - LIDAR info on vortex generation and dissipation
  - ATM surveillance records
  - Pilot reports
  - Aircraft flight recorder data
- Analysis to produce detailed vortex generation and dissipation rates for different groups of aircraft
- Comparison of calculated risk values could be determined



Records of vortex formation and dissipation



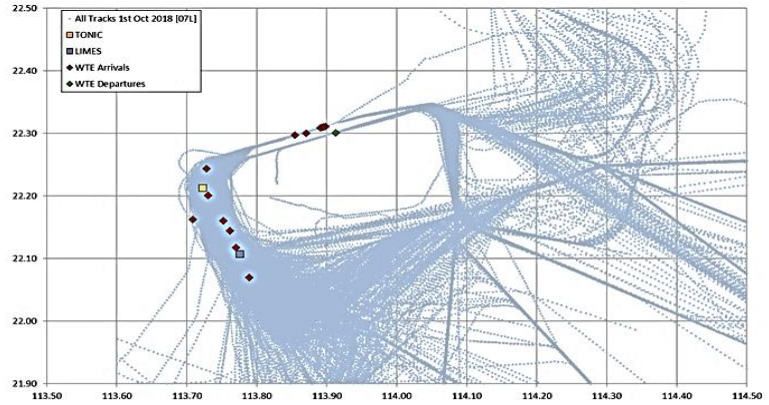


Figure 13: Location of reported WTE Encounters during 07L operations, overlaid on typical 07L daily flight tracks.

Compare vortex dissipation rates

ATM Surveillance Data

Project Safety Plan and Local Safety Case

- Goal Structuring Notation (GSN) used in the Project Safety Plan
  - identify dependencies that needed to be addressed for the major safety activities involved in the implementation
- Series of Hazard Identification Workshops
  - All stakeholders - address potential operational hazards and risks
- Local Safety Case conclusion - the predicted impact to wake turbulence encounter reporting and severity is in line with the expectations of the RECAT-EU Safety Case
  - Detailed analysis of local Hong Kong wake data supports the reduction in wake turbulence separation

Implementation Plan and Mitigation Measures

- SMS process, an operational Safety Assessment on the implementation was conducted in JUNE 2020
  - Potential hazards and associated risks were addressed
- Controller training for Approach controllers (AUG-OCT 2020)
- Briefing sessions for Aerodrome controllers (AUG-OCT 2020)
- Decision support tools to indicate wake turbulence group of aircraft and quick reference list also available to show the new separation minima

Simulator training for Approach controllers

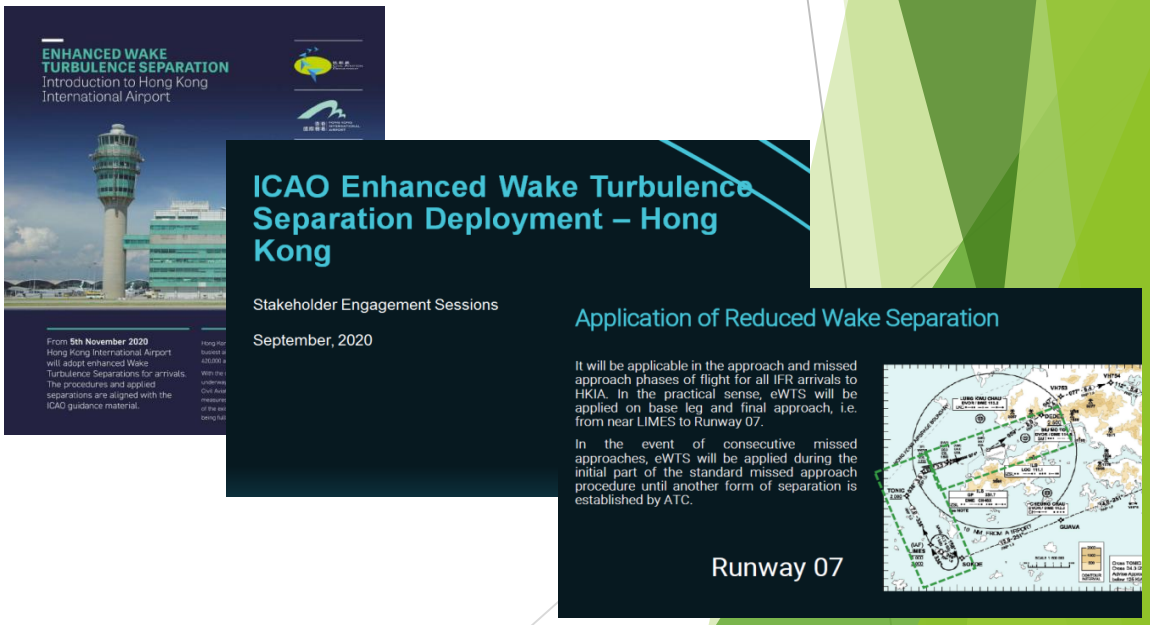
ICAO 7 Wake Turbulence Groups

Distance-based Enhanced Wake Turbulence Separation (eWTS) Minima

Follower / Leader	Group A	Group B	Group C	Group D	Group E	Group F	Group G
Group A		4 NM	5 NM	5 NM	6 NM	6 NM	8 NM
Group B		3 NM	4 NM	4 NM	5 NM	5 NM	7 NM
Group C				3 NM	3.5 NM	3.5 NM	6 NM
Group D							4 NM
Group E							4 NM

Implementation Plan and Mitigation Measures

- Stakeholder Engagement Workshops (SEP 2020) – attended by 100+ aircraft operators, pilots, airlines ops staff and organizations



Operational Experience and Benefits

During the traffic downturn

- Taken every opportunity to apply the revised wake turbulence separation minima
  - For controller familiarity
- No increase in pilot reports of wake turbulence encounters
- No increase in missed approaches as a result of eWTS

Paves way for post-pandemic traffic recovery

- Optimize runway capacity
- Reduced holding for arrivals
- Improve runway delivery rates under existing airport infrastructure

The meeting is invited to:

- note the implementation process and status of eWTS by Hong Kong, China;
- encourage States/Administrations to arrange appropriate sessions for experience sharing and lessons learnt with others and for them to kick-start project initiation; and
- discuss any relevant matters as appropriate.

Thank you. The End!