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Arrival & Departure Segregation in Closely Spaced Parallel Runway Operations

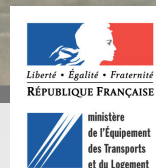
Paris-CDG Airport

Wakenet Europe Workshop

05-07 February 2007

S7 08L-26R CAT I
Eurocontrol, Brussels

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- **Project Overview**
- **CDG Airport in a few words**
- **CDG current operations**
 - Basic Operations
 - Origins
 - Current operations issues
- **Optimizing current operations**
 - LIDAR Experimentations & Expectations
- **Project Roadmap**



ADS-CSPR : Project Overview

- Project Overview
- CDG layout
- Current operations
- Optimizing current operations
- Project Status

■ Project Partners

- Eurocontrol
- Aéroports De Paris (ADP)
- DGAC/DSNA : French Air Navigation Service Provider

■ Objective :

- Measure wake turbulences on Paris-CDG Closely Spaced Parallel Runways (CSPR)
 - ➔ Understand Wake Vortex behaviour : dispersion, strength evolution, life time, effect of one runway to the other
- With Eurocontrol LIDAR equipment
- To simplify and improve CSPR Operations
- Mid-term perspectives (final approaches,...)



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- 541.000 movements in 2006
- Peak Hour : 141 movements
- 2 active Control Towers
- 2 sets of Parallel Runways :
 - Runways lengths : Inner 4200m / Outer 2700m
 - Staggered Thresholds
 - For environmental issues, especially in east flow...
 - Separation between Runway Centrelines :
 - 384m within CSPRs
 - 3000m between inner Runways



CDG Airport layout

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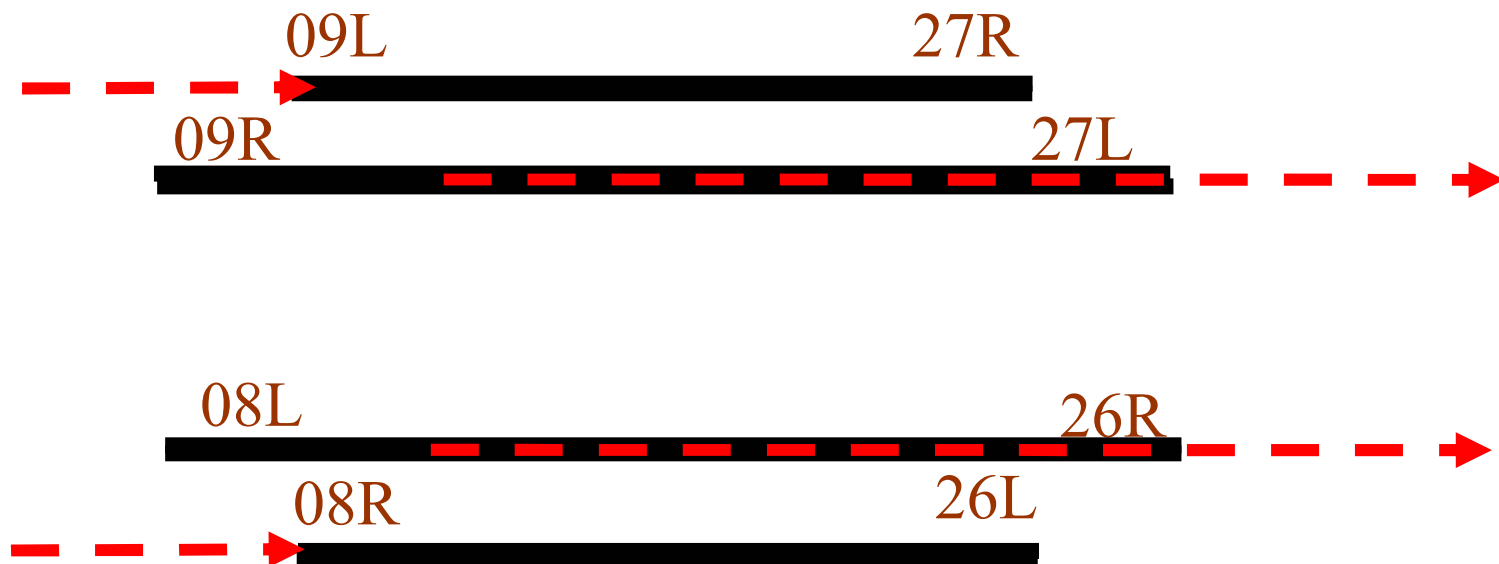


Basic Operations

➔ Departures on inner runways

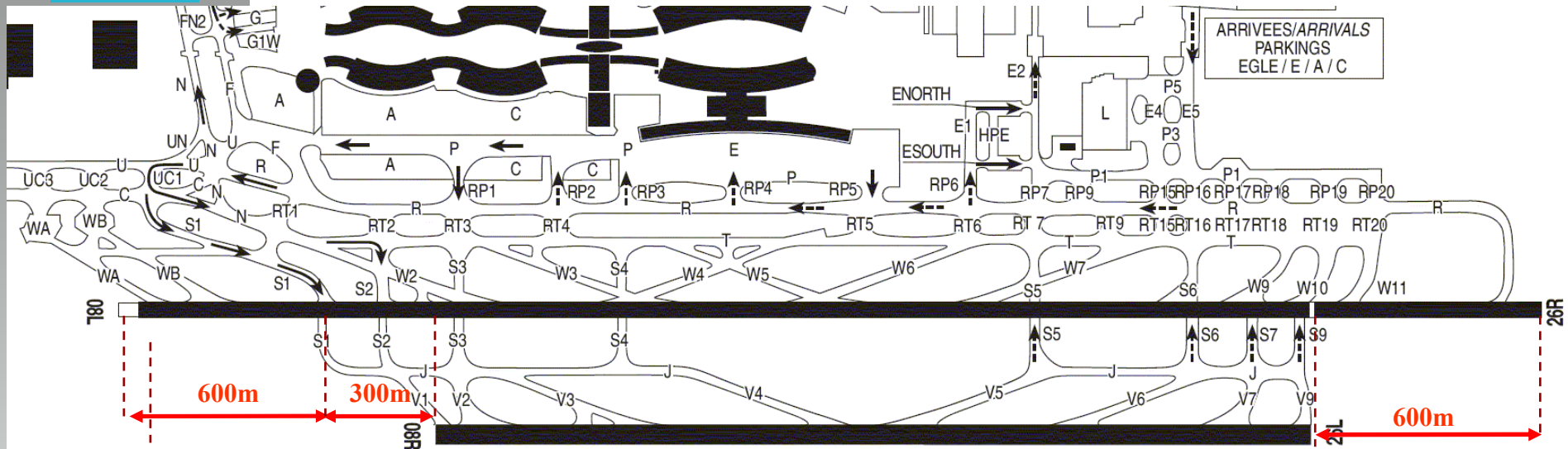
➔ Arrivals on outer runways

Example : facing east conditions





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Resulting Safety Measures :

- Basic line-up threshold for Heavy jets displaced 600m eastwards
 - Implied 600m lengthening of runway to maintain TORA (1997) ...
- Operational Procedures associated to Wake Turbulence risks
 - Use of line-up taxiways is dependent on aircraft category (Heavy, Medium, Light)



CDG Current Operations : origins

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- **Origins of current measures for the mitigation of Wake Turbulences :**
 - Lack of adapted and accurate data concerning Wake Turbulence impact on CSRR Operations
 - Conservative measures for the opening of the south pair of runways in 1999
 - Main identified hazards at the time :
 1. Impact of wake turbulence :
 - generated by a Heavy jet landing 08R
 - on a Medium jet close to rotation/lifting 08L
 2. Impact of wake turbulence :
 - generated by a Heavy jet departing 08L (short take-off)
 - On a Medium jet landing on 08R



CDG Current Operations

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- Complexity of operational procedures for GROUND and LOCAL Controllers results in :
 - Increasing the Controller workload (due to traffic segregation strategy between Heavies, Medium Jets/Props, Lights)
 - Slowing down the departure sequences
- Proximity of the 08L departure queue and the Terminal 2 very busy area results in :
 - Slowing down the taxiing for departures and arrivals in the southwest area of the airport
- Facts
 - No identified Wake Vortex-related incident has been reported concerning operations on CDG pairs of runways
- New Elements
 - Recent Availability of reliable Wake Vortex measurement systems (LIDAR, ...)
 - ➔ Launch of ADS-CSPR Project in 2006



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■ Expected Results

- Proof, by means of LIDAR measures, that turbulences generated **on outer runway** have no impact on traffic **on inner runway**
- Proof, by means of LIDAR measures, that turbulences generated **on inner runway** have no impact on traffic **on outer runway**

■ Expected Applications

- More flexible line-up strategies for most or all aircraft categories
 - e.g. lining up Medium jets via S1 taxiway,...
- Optimization of the design of the new taxiway network in the southwest area of the airport

■ Benefits for the two pairs of runways

- Simplifying Traffic management for controllers
- Speeding up departure sequences
- Traffic flowing steadily in the southwest area



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- Christmas 2006 : Eurocontrol LIDAR at Paris-CDG Airport
- 12/2006 → 01/2007 : Site Survey and Selection
- 02/2007 : LIDAR installation and set-up
- From 02/2007 : Measures, Reporting & subsequent studies...



■ Thank You !



■ Questions ?

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