Enhanced Time Based Separation (ETBS) & RECAT EU

Heathrow Crew Briefing
Time Based Separation has been in use at London Heathrow since March 2015. The next phase of the TBS evolution is to enhance the current Heathrow TBS system so it provides controllers with tool support to deliver more efficient wake separations, based on RECAT EU to runway threshold.
What’s new?

- RECAT EU is being introduced at Heathrow Airport during Spring 2018. This change alters the arrivals spacing between certain aircraft pairs using an enhancement of TBS called ETBS, and ATC will provide wake separation to runway threshold in addition to the 4DME point.
- This RECAT EU change also alters the wake turbulence separation applied on departure at Heathrow.
- Some aircraft types, based on weight, are changing wake turbulence categories, most notably the B757/B767 families & A300/A310s.
Scope & Benefits

Enhance existing Heathrow TBS system

• More efficient wake separations based on RECAT-EU (Arrivals & Departures)

• Separation to runway threshold supported by ‘Optimised Runway Delivery’ tool (ORD)

• Concept similar to current day TBS, refinement of controller HMI (TBS Table & Indicator)

• Anticipated landing rate increase of 0.5-1.0 movements per hour

• Average anticipated departure rate increase of 1.0 movement per hour

• RECAT Wake Vortex Categories are currently in use at Paris CDG

  • http://www.eurocontrol.int/articles/recat-eu
  • http://www.eurocontrol.int/publications/recat-eu-european-wake-turbulence-categorisation-and-separation-minima-approach-and
Objectives of ETBS

• Build on current TBS system i.e. resilience to moderate and strong head wind conditions on final approach.
• RECAT-EU wake separations are more efficient at the heavier end of Vortex Mix i.e. Heathrow traffic mix
• Enhance TBS tool to calculate anticipated compression inside 4DME
• Supports delivery of separation to the runway threshold, in line with CAA requirement
• Improved in service monitoring of wake separation
• Anticipated landing rate increase of 0.5-1.0 movements per hour
### Prevalent Heathrow Types

<table>
<thead>
<tr>
<th>Category</th>
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<th>Series</th>
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<td>RJ1H/85</td>
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<td>B787</td>
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**Crews should communicate the correct aircraft type (including series) on first contact with Heathrow Director.**
First Call with ‘Heathrow Director’

• Please note that your vortex designator on the ICAO flight plan does not change

• Consequently, your suffix of ‘SUPER’ or ‘HEAVY’ does not change

• For example, the Boeing 767 series, whilst under the upper category for RECAT EU, would still use the suffix ‘HEAVY’ on initial contact with the approach controller

• An example call might be:

  “Heathrow Director, Delta 123 Heavy, Boeing 767-400 etc…”
Heavy Category

• Both A346 and B763 are in the current ICAO HEAVY category, whilst their wing spans have a difference of more than 15 metres.

• Therefore, they suffer from over-conservative separations when the B767 is the leader.
Current Separation

ICAO current separations
Safe, but over conservative.
Future Separation

RECAT-EU separations
It is safe too, and the separation is more efficient.

BOEING 767-300
AIRBUS A340-600
Medium Category

• Both A320 and E145 are in the current ICAO MEDIUM category, whilst their wing spans have a difference of more than 12 metres.

• Therefore, the A320 suffers from over conservative separations when following Heavy aircraft.
Current Separation

ICAO current separations
Safe, but over conservative for A320.
Future Separation

RECAT-EU separations
It is safe and the separation is more efficient.
Optimised Runway Delivery (ORD)

- The ORD tool is configured with nominal airspeed profiles based on the aircraft type and wake turbulence category that have been calibrated to support delivery of the wake turbulence separation rules to the runway threshold.
- Algorithm calculates the anticipated compression between the aircraft pair from the point at which the lead aircraft crosses 4DME (5DME for A380s) and decelerates to its final landing stabilisation airspeed.
- Tool calculates anticipated compression based on wind profile inside 4DME
- Compression calculated between specific aircraft pairs
- ORD takes into account:
  - The runway surface wind conditions
  - The prevailing glideslope wind conditions.
  - The anticipated airspeed profile of the lead aircraft type from 4DME to runway threshold
  - The anticipated airspeed profile of the follower aircraft type on final approach.
RECAT-EU 6-CAT to be applied at threshold

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<thead>
<tr>
<th>Leader</th>
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- Due to Runway Occupancy Times (ROT) some pairs require extra spacing, similar to today's A380 operations
- ORD tool will automatically add this
- **IT ISIMPORTANT TO COMPLY WITH ATC SPEED INSTRUCTIONS AT ALL TIMES**
Departures
RECAT-EU Departures

- European Wake Vortex Re-categorisation (RECAT-EU) is a new, much more precise categorisation of aircraft compared to ICAO, it aims at safely helping to reduce delays by redefining wake turbulence categories and their associated separation minima.

- RECAT Departures will only be used where wake vortex is the primary constraint between two aircraft. The departure routing will continue to be the largest constraint for separating aircraft on departure as per today’s operation.
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- One extra movement per hour on average (extra 17 movements per day)
- Peak hour (12:00-13:00) 1.6 extra movements
- Reduced time separations behind Airbus A380 aircraft
- Reduced time for medium following larger aircraft (55% of Heathrow traffic in A320 family)

*Some Heathrow route separations require 120 sec spacing minimum which overrides any wake vortex separations