SOUTH AFRICAN



CIVIL AVIATION AUTHORITY

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CIVIL AVIATION AUTHORITY

AERONAUTICAL INFORMATION CIRCULAR

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OPERATION OF AIRCRAFT

GENERAL

WAKE TURBULENCE SEPARATION DATA

1. Wake Turbulence Separation

- 1.1 The spacing between aircraft, determined either by time or distance, is to be applied so that aircraft of a lower weight category do not fly through the wake of an aircraft of a higher category within the area of maximum vortices.
- 1.2 Wake turbulence separation must be considered when aircraft of different weight categories are operating into and out of an aerodrome during light wind conditions.
- 1.3 During calm or light wind conditions, vortices do not disperse easily and could remain in the runway area for an extended period of time. Vortices are known to sink and move outwards from the wingtips and should the cross-wind component equal the lateral movement of the vortex (typically 2-3 knots), the vortex can remain on the runway for a significant period of time. Thermal conditions could affect the vertical sink of the vortex.
- 1.4 Ground reflection causes vortices to travel horizontally over the ground away from one another.
- 1.5 All aircraft generate vortices at the wing tips as a consequence of producing lift. The heavier the aircraft and the slower it is flying, the stronger the vortex. This turbulence is the most dangerous during take-off, initial climb and the final approach phase and could induce roll, impose changes in rate of climb or descent and may result in structural overloads.
- 1.6 Hazardous wake vortices begin to be generated by fixed wing aircraft from the point of rotation on departure and continues until the nose wheel touches down on landing.
- 1.7 When helicopters are in forward flight the downwash from the main rotor(s) is transformed into a pair of trailing vortices similar to the wing tip vortices of a fixed wing aircraft.
- 1.8 When the helicopter weight is transferred from the landing gear to the rotor a strong downwash is created in all directions, although this can be moved by the wind.

2. En-route and Intermediate Approach

2.1 No special longitudinal spacing based on time are required. When a Medium, Small or Light aircraft is positioned by radar to cross behind or follow the same track as a Heavy aircraft, the minimum spacing shall be 5 miles.

3. Radar Wake Turbulence Separation Minima

The distance minima will apply when an aircraft follows or crosses behind, at the same altitude or less than 1000 feet below, the wake generating aircraft in the arrival and departure phase.

Leading Aircraft	Following Aircraft	Minimum Distance	
Super Heavy / Heavy	Super Heavy	Not required (see note)	-
Super Heavy	Heavy	6NM	
Super Heavy	Medium	7NM	
Super Heavy	Light	8NM	
	0		
Heavy	Heavy	4NM	
Heavy	Medium	5NM	
Heavy	Light	6NM	
7.			
Medium	Light	5NM	

Note: Where standard radar separation minima and radar wake turbulence separation minima, when applied together present different minima values, the larger of the two minima's shall be applied.

4. Arriving Aircraft – Non - Radar Wake Turbulence Longitudinal Separation Minima

- 4.1 The following non-radar minima should be applied to aircraft landing behind an A380-800 aircraft;
 - MEDIUM aircraft behind an A380-800 aircraft ------ 3 minutes;
 - b) LIGHT aircraft behind an A380-800 aircraft ------ 4 minutes;

5. Departing Aircraft – Non – Radar Wake Turbulence Longitudinal Separation Minima

- 5.1 A minimum separation of 3 minutes should be applied for a LIGHT or Medium aircraft and 2 minutes for a non-A380-800 HEAVY aircraft taking off behind and A380-800 aircraft when the aircraft are using:
 - a) the same runway;
 - b) parallel runways separated by less than 760 m (2500 ft)
 - c) crossing runways if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 300 m (1000 ft) below:
 - d) parallel runways separated by 760 m (2500 ft) or more, if the projected flight path of the second aircraft will cross the projected flight path of the first aircraft at the same altitude or less than 300 m (1000 ft) below.



Three minute separation for following aircraft (Refer to paragraph 5.1 a & b)

- A separation minima of 4 minutes should be applied for a LIGHT or MEDIUM aircraft when taking off behind an A380-800 aircraft from;
 - a) an intermediate part of the runway; or

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b) an intermediate part of a parallel runway separated by less than 760 m (250 ft).



Three minute wake turbulence separation for crossing aircraft (Refer to paragraph 5.1 c & d)



Four minute wake turbulence separation for following aircraft (Refer to paragraph 6 a & b)

7. Displaced Landing Threshold

A separation minimum of 3 minutes should be applied between a LIGHT or MEDIUM aircraft and an A380-800 aircraft when operating on a runway with a displaced landing threshold when;

- a) a departing LIGHT or MEDIUM aircraft follows an A380-800 aircraft arrival; or
- b) an arriving LIGHT or MEDIUM aircraft follows an A380-800 aircraft departure if the projected flight paths are expected to cross.

8. Opposite Direction

A separation minimum of 3 minutes should be applied between a Light or Medium aircraft and an A380-800 aircraft when the A380-800 aircraft is making a low or missed approach and the LIGHT or MEDIUM aircraft is;

- a) Utilizing an opposite-direction runway for departure; or
- b) Landing on the same runway in the opposite direction, or on a parallel opposite-direction runway separated by less than 760m (2500 ft)



Three minute wake turbulence separation for opposite direction take-off. (Refer to paragraph 8 a)



Three minute wake turbulence separation for opposite direction landing (Refer to paragraph 8 b).

9. Aircraft Initiating a Touch and Go

9.1 When an aircraft requests a clearance for a touch and go, consideration should be given to the weight category of the preceeding aircraft.

10. Helicopter Aerodrome Operations

- 10.1 When hovering or air taxiing, a helicopter directs a forceful blast of air downwards which then rolls out in all directions. To minimise this effect controllers should:
 - a) Instruct helicopters to ground taxi rather than air taxi when operating in areas where aircraft are parked or holding.
 - b) If air taxiing is imperative, helicopters must be routed to:
 - c) Avoid over flying parked aircraft or vehicles;
 - d) Give the maximum possible clearance from other aircraft and loose ground equipment.

10.2 Helicopters must not be air taxied close to taxiways or runways where light aircraft operations (including light helicopter operations) are in progress. Vortex wake separation will be applied between helicopters air taxiing across runways and other aircraft, by considering the helicopter to be a departure from a crossing runway.

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