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## 1 Procedures for Departing Aircraft

Doc 4444 §6.7

### General — ATC Clearance Elements for Departing Aircraft

A departure clearance from ATC must specify the following (when necessary for separation):

- 1 **Direction of take-off** and the turn after take-off
- 2 **Heading or track** to be made good before taking up the cleared departure track
- 3 **Level to maintain** before continuing the climb to the assigned level
- 4 **Time, point and/or rate** at which a level change shall be made
- 5 Any other manoeuvre consistent with **safe operation of the aircraft**

#### DEFINITION / STANDARD PRACTICE

At aerodromes where **Standard Instrument Departures (SIDs)** have been established, departing aircraft should *normally* be cleared to follow the **appropriate SID**.

## 2

## Minimum Separation between Departing Aircraft

Doc 4444 §6.7.2

## 1 MIN

Diverging tracks  $\geq 45^\circ$  immediately after take-off (lateral separation)

## 2 MIN

Same track & preceding aircraft is 40 kt or more faster

## 5 MIN

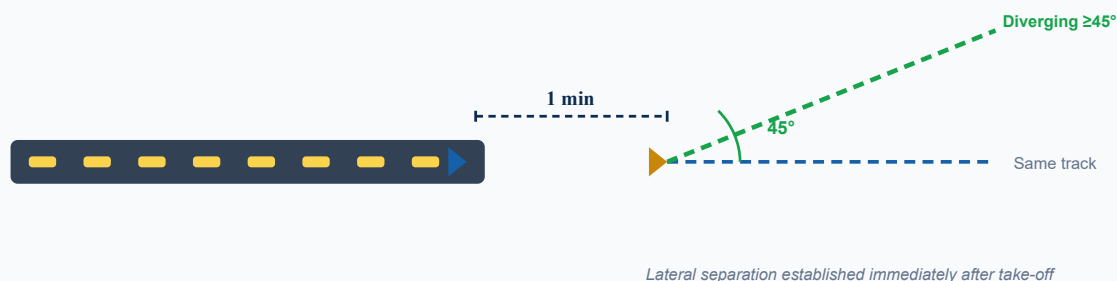
Same track, second aircraft flying through level of first (no vertical separation)

## Rule 1 — One-Minute Separation (Diverging Tracks)

## ✓ STANDARD OPERATING PROCEDURE

**Condition:** Aircraft are to fly on tracks **diverging by at least  $45^\circ$**  immediately after take-off so that lateral separation is provided.

**Applied minimum:** 1 MINUTE between take-offs.

FIGURE 7.1 — 1-MINUTE SEPARATION: DIVERGING TRACKS  $\geq 45^\circ$ 

## Rule 2 — Two-Minute Separation (Speed Differential, Same Track)

## ⚠ IMPORTANT DGCA LIMITATION

**Condition:** Preceding aircraft is 40 kt or MORE faster than the following aircraft, and **both aircraft propose to follow the same track.**

**Applied minimum:** 2 MINUTES between take-offs.

FIGURE 7.2 — 2-MINUTE SEPARATION: SAME TRACK, SPEED DIFFERENTIAL  $\geq 40$  KT



### Rule 3 — Five-Minute Separation (Level Crossing, Same Track)

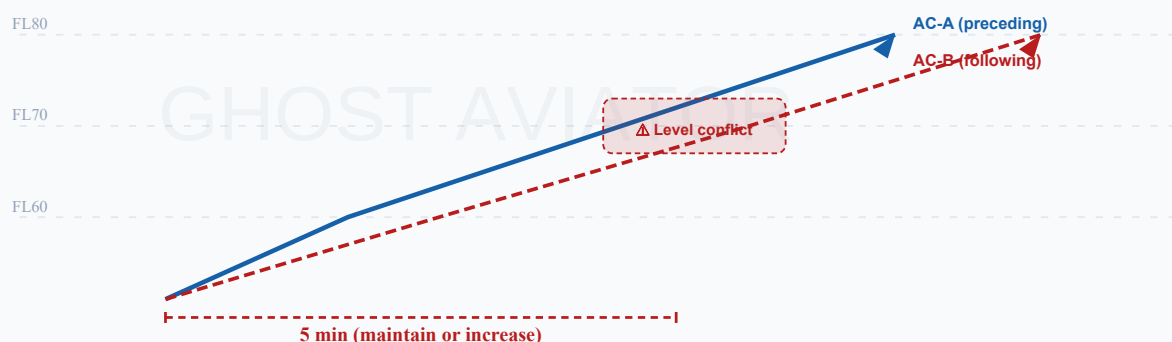
#### CRITICAL DGCA RULE — STRICTEST DEPARTURE SEPARATION

**Condition:** A departing aircraft will be flown **through the level of a preceding departing aircraft AND both propose to follow the same track**. Vertical separation does not exist during this period.

**Applied minimum:** **5 MINUTES** between take-offs.

**Additional obligation:** Action must be taken to ensure that the 5-minute separation will be *maintained or increased* while vertical separation does not exist.

FIGURE 7.3 — 5-MINUTE SEPARATION: LEVEL CROSSING, SAME TRACK



3

## Separation: Departing Aircraft from Arriving Aircraft

Doc 4444 §6.7.3

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The following separation shall be applied when **take-off clearance is based on the position of an arriving aircraft**.

## Case A — Arriving Aircraft Making a Complete Instrument Approach

A departing aircraft may take off:

### ✓ **CONDITION A (A) — ANY DIRECTION, BEFORE PROCEDURE TURN**

In **any direction** until the arriving aircraft has started its **procedure turn or base turn** leading to final approach.

### ⚠ **CONDITION A (B) — SPECIFIC DIRECTION, AFTER PROCEDURE TURN STARTED**

In a direction which is **different by at least 45°** from the reciprocal of the direction of approach — *after* the arriving aircraft has started procedure turn or base turn leading to final approach — **provided that** the take-off will be made **at least 3 minutes** before the arriving aircraft is estimated to be over the **beginning of the instrument runway**.

## Case B — Arriving Aircraft Making a Straight-In Approach

A departing aircraft may take off:

### ✓ **CONDITION B (A) — ANY DIRECTION**

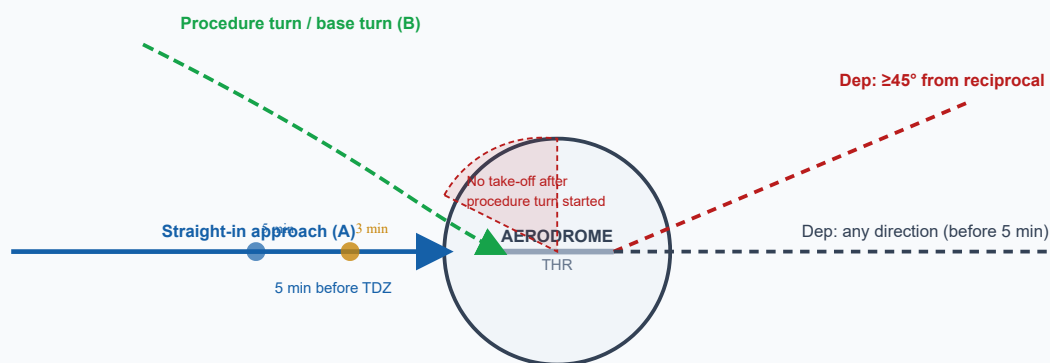
In **any direction** until **5 minutes before** the arriving aircraft is estimated to be over the **instrument runway**.

**i** **CONDITION B (B) — DIRECTION DIFFERING  $\geq 45^\circ$  FROM RECIPROCAL**

In a direction which is **different by at least  $45^\circ$**  from the reciprocal of the direction of approach of the arriving aircraft:

- **B(b)(i):** Until **3 minutes before** the arriving aircraft is estimated to be over the beginning of the instrument runway, **OR**
- **B(b)(ii):** Before the arriving aircraft crosses a **designated fix on the approach track** — the location of such fix to be determined by the appropriate ATS authority after consultation with the operators.

**FIGURE 7.4 — SEPARATION OF DEPARTING FROM ARRIVING AIRCRAFT**



| Arriving Aircraft Situation                                               | Departure Direction                      | Key Time/Condition                                                                                                    |
|---------------------------------------------------------------------------|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Complete Instrument Approach</b><br>Before procedure/base turn started | <b>Any direction</b>                     | Until procedure/base turn started                                                                                     |
| <b>Complete Instrument Approach</b><br>After procedure/base turn started  | <b>≥ 45° from reciprocal of approach</b> | <b>At least 3 min before arriving a/c over instrument runway THR</b>                                                  |
| <b>Straight-In Approach</b>                                               | <b>Any direction</b>                     | <b>Until 5 min before arriving a/c over instrument runway</b>                                                         |
| <b>Straight-In Approach</b>                                               | <b>≥ 45° from reciprocal of approach</b> | <b>Until 3 min before arriving a/c over instrument runway THR OR before crossing designated fix on approach track</b> |

## 4

## Reduction in Separation Minima Near Aerodromes

Doc 4444 §6.7.4

In the vicinity of aerodromes, the **separation minima may be reduced** if any of the following three conditions are satisfied:

### ✓ CONDITION (A) — CONTROLLER PROVIDES VISUAL SEPARATION

Adequate separation can be provided by the **aerodrome controller** when each aircraft is **continuously visible** to this controller.

### 👁️ CONDITION (B) — MUTUAL VISUAL CONTACT BETWEEN FLIGHT CREWS

Each aircraft is **continuously visible to flight crews of the other aircraft concerned**, and the pilots thereof **report that they can maintain their own separation**.



#### CONDITION (C) — FOLLOWING AIRCRAFT REPORTS VISUAL CONTACT

In the case of **one aircraft following another**: The flight crew of the *succeeding* aircraft reports that the **other aircraft is in sight** and **separation can be maintained**.

## 5

## Information for Departing Aircraft

Doc 4444 §6.8

### A — Meteorological Conditions

Information regarding **significant changes** in meteorological conditions in the **take-off or climb-out area**, obtained by the unit providing approach control service after a departing aircraft has established communication, **shall be transmitted without delay** — except when it is known the aircraft already has the information.



#### NOTE — SIGNIFICANT MET CHANGES DEFINED AS:

- Surface wind direction or speed
- Visibility
- Runway Visual Range (RVR)
- Air temperature (for turbine-engine aircraft)
- Occurrence of thunderstorm or cumulonimbus
- Moderate or severe turbulence
- Wind shear
- Hail
- Moderate or severe icing
- Severe squall line
- Freezing precipitation
- Severe mountain waves
- Sand storm / Dust storm
- Blowing snow
- Tornado or Waterspout

## B — Operational Status of Visual or Non-Visual Aids

### RULE

Information regarding changes in the **operational status of visual or non-visual aids** essential for take-off and climb shall be **transmitted without delay** to a departing aircraft, except when it is known that the aircraft already has received the information.

## 6 Procedures for Arriving Aircraft

Doc 4444 §6.9

### General — STARs

#### DEFINITION

At aerodromes where **Standard Instrument Arrivals (STARs)** have been established, arriving aircraft should normally be cleared to follow the appropriate STAR.

The aircraft shall be informed of the **type of approach to expect** and **runway-in-use** as early as possible.

After coordination with the approach control unit, the **ACC may clear the first arriving aircraft for approach** rather than to a holding fix.

### Visual Approach — Definition

#### DEFINITION — VISUAL APPROACH

A **visual approach** is an approach by an **IFR flight** when either part or all of an instrument approach procedure is not completed and the **approach is executed in visual reference to terrain**.

### Who Can Initiate a Visual Approach?

- Clearance for visual approach may be **requested by the pilot**, or
- May be **initiated by the controller**.

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#### **RESTRICTION — WHEN CONTROLLER CANNOT INITIATE VISUAL APPROACH**

The controller shall **NOT** initiate a visual approach when there is reason to believe that the **flight crew is not familiar with the aerodrome and its surrounding terrain**.

Controller should take into consideration **prevailing traffic and meteorological conditions** before initiating a visual approach.

### Direct Base / Final Leg Clearance

#### **PERMITTED — DIRECT BASE / FINAL**

Aircraft may be cleared for **direct base leg / final**, if there is reasonable assurance that visual approach and landing can be completed.

#### **PILOT RESPONSIBILITY**

When clearance to execute visual approach has been issued, it shall be the **responsibility of the pilot** to maintain **terrain clearance**.

Separation shall be provided between an aircraft cleared for visual approach and other arriving and departing aircraft.

### Visual Approach — Flight Crew Conditions

A flight crew **may request** visual approach if they have runway in sight and can maintain visual reference to terrain, subject to the following conditions:

| Condition              | Requirement                                                                                                                                                                        | Aircraft Category       |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| (a) Ground Visibility  | <b>Not below higher of aerodrome operating minima of associated non-precision approach or minimum visibility/RVR</b>                                                               | —                       |
|                        | Min visibility/RVR = 2800 m                                                                                                                                                        | Category A/B aeroplanes |
|                        | Min visibility/RVR = 3200 m                                                                                                                                                        | Category C aeroplanes   |
|                        | Min visibility/RVR = 3600 m                                                                                                                                                        | Category D aeroplanes   |
|                        | <b>Ground visibility ≥ 5 km if only a circling approach is available for that runway</b>                                                                                           | All categories          |
| (b) Ceiling            | Reported ceiling is at or above the level of the <b>beginning of the initial approach segment</b>                                                                                  | All                     |
| (c) Pilot's Own Report | Pilot reports at initial approach segment level or during instrument approach that conditions are such that visual approach and landing can be completed with reasonable assurance | All                     |

### Pilot's Obligations During Visual Approach

The pilot shall **advise the controller immediately** when:

- a** Weather has **deteriorated** and unable to keep the terrain in sight
- b** Unable to **continue flight following the preceding aircraft**
- c** **Additional spacing** is required from the preceding aircraft

The pilot at the time of requesting visual approach should also give a **position report**.

## Instrument Approach

### RULE

The **approach control unit shall specify** the instrument approach procedure to be used by arriving aircraft. A flight crew may **request an alternative procedure** and, if circumstances permit, should be **cleared accordingly**.

7

## Clearance to Fly Maintaining Own Separation While in VMC

Doc 4444 §6.10

When so requested by an aircraft **and** provided it is agreed by the pilot of the other aircraft **and** so authorised by the appropriate ATS authority, an ATC unit may clear a controlled flight — including departing and arriving flights — operating in **Airspace Classes D and E** in VMC during the hours of daylight to fly subject to maintaining own separation to one other aircraft and remaining in VMC.

### DGCA LIMITS — ALL THREE CONDITIONS MUST BE MET SIMULTANEOUSLY

1. Must be **requested by the aircraft**
2. Must be **agreed by the pilot of the other aircraft**
3. Must be **authorised by the appropriate ATS authority**

When a controlled flight is so cleared, the following shall apply:

### CONDITION (A) — ALTITUDE RESTRICTION

The clearance shall be for a specified portion of the flight **at or below 3050 m (10,000 ft)**, during climb or descent, and subject to further restrictions as and when prescribed on the basis of regional air navigation agreements.

### **CONDITION (B) — ALTERNATIVE INSTRUCTIONS REQUIRED**

If there is a possibility that flight under VMC may become **impracticable**, an IFR flight shall be provided with **alternative instructions** to be complied with in the event that flight in VMC cannot be maintained for the term of the clearance.

### **CONDITION (C) — PILOT'S ACTION ON DETERIORATING CONDITIONS**

The pilot of an IFR flight, on observing that conditions are deteriorating and considering that operation in VMC will become impossible, **shall inform ATC before entering IMC** and shall proceed in accordance with the alternative instructions given.

Essential traffic information shall be given to controlled flights concerned whenever they constitute essential traffic to each other.

## 8

## Expected Approach Time (EAT) & Onward Clearance Time

Doc 4444 §6.11–6.12

### Expected Approach Time (EAT)

#### **DEFINITION — EAT**

An Expected Approach Time (EAT) is the time at which ATC expects that an arriving aircraft, following a delay, will be **cleared to commence its approach** from the holding fix.

#### **10 MIN**

Minimum delay threshold — EAT shall be determined when expected delay is **10 minutes or more**

#### **5 MIN**

Revision trigger — revised EAT transmitted when it differs from previous by **5 minutes or more**

#### **30 MIN**

EAT transmitted by most expeditious means when holding expected to be **30 minutes or more**

EAT should be transmitted to the aircraft **as soon as practicable** and preferably *not later than at the commencement of its initial descent from cruising level*.

### REVISION OF EAT

A revised EAT shall be transmitted to the aircraft **without delay** whenever it differs from that previously transmitted by **5 minutes or more**, or such lesser period of time as agreed between the ATS units concerned.

### IDENTIFICATION OF HOLDING FIX

The **holding fix to which an EAT relates shall be identified** together with the EAT whenever circumstances are such that this would not otherwise be evident to the pilot.

## Onward Clearance Time (OCT)

### DEFINITION — ONWARD CLEARANCE TIME

*"Onward clearance time"* is the time at which an aircraft can expect to leave the fix at which it is being held.

In the event an aircraft is held en route or at a location or aid **other than the initial approach fix**, the aircraft concerned shall, as soon as practicable, be given an expected onward clearance time from the holding fix. The aircraft shall also be advised if **further holding at subsequent holding fixes** is expected.

## 9 Information for Arriving Aircraft

Doc 4444 §6.13

### A — On First Communication with Approach Control Unit

As early as practicable after an aircraft has established communication with the unit providing approach control service, the following elements of information, **in the order listed**, shall be transmitted to the aircraft (except what the aircraft is already known to have received):

- a Type of approach** and runway-in-use
- b Meteorological information**, as follows:
- c Current runway surface conditions**, in case of precipitants or other temporary hazards

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- d Changes in the **operational status of visual and non-visual aids** essential for approach and landing

#### **ROUTE CHANGE DURING APPROACH**

If it becomes necessary or operationally desirable that an arriving aircraft follow an instrument approach procedure or use a **runway other than that initially stated**, the flight crew shall be advised **without delay**.

## **B — At Commencement of Final Approach**

The following information shall be transmitted to aircraft at the commencement of final approach:

- a **Significant changes** in the mean surface wind direction and speed
- b Latest information, if any, on **wind shear and/or turbulence** in the final approach area
- c Current **visibility** representative of the direction of approach and landing, or the current RVR value(s) and trend (supplemented by slant visual range, if provided)



#### **NOTE — SIGNIFICANT WIND COMPONENT CHANGES (WHEN CONTROLLER HAS COMPONENT FORM)**

| Wind Component                   | Significant Change Threshold |
|----------------------------------|------------------------------|
| Mean <b>Head-wind</b> component  | 10 kt                        |
| Mean <b>Tail-wind</b> component  | 2 kt                         |
| Mean <b>Cross-wind</b> component | 5 kt                         |

## **C — During Final Approach (Transmitted Without Delay)**

During final approach, the following information shall be transmitted **without delay**:

- a The **sudden occurrence of hazards** (e.g., unauthorized traffic on the runway)
- b **Significant variations** in the current surface wind, expressed in terms of **minimum and maximum values**
- c **Significant changes** in runway surface conditions

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- d Changes in the **operational status of required visual or non-visual aids**
- e Changes in **observed RVR value(s)** in accordance with the reported scale in use, or changes in the **visibility** representative of the direction of approach and landing

## 10 DGCA Practice Questions & Answers

Air Regulations — pp. 196–198

### ANSWER KEY

1-A 2-B 3-C 4-A 5-C 6-B 7-B 8-C 9-A 10-C

**Q1** If an arriving aircraft is making a straight-in approach, a departing aircraft may *any* :  
take off in *direction*

- A** Until five minutes before the arriving aircraft is estimated to be over the instrument runway
- B Until ten minutes before the arriving aircraft is estimated to be over the instrument runway
- C Until two minutes before the arriving aircraft is estimated to be over the instrument runway

✓ **Answer: A** — For straight-in approach, any-direction take-off is permitted until **5 minutes before** estimated arrival over the instrument runway. [Ref: p.190]

**Q2** For controlled traffic in the vicinity of an airport, separation minima may be reduced:

- A At the discretion of the air traffic controller
- B** When the commander in the following aircraft has the preceding aircraft in sight and is able to maintain own separation
- C If the commander of the involved aircraft so requests

✓ **Answer: B** — Reduction is permitted when the succeeding aircraft's crew has the preceding aircraft in sight and reports they can maintain own separation. [Ref: p.191]

**Q3** At the commencement of final approach, if the controller possesses wind information in the form of components, significant changes in mean surface wind direction and speed shall be transmitted. The mean tail-wind component significant change is:

A 3 kt

B 4 kt

**C 2 kt**

✓ **Answer: C** — The significant change threshold for mean tail-wind component is **2 kt**. (Head-wind = 10 kt; Cross-wind = 5 kt) [Ref: p.195]

**Q4** The EAT has to be transmitted to the pilot as soon as possible, in case the expected delay is:

**A 5 minutes or more**

B 15 minutes or more

C 20 minutes

✓ **Answer: A** — An EAT shall be determined for an arriving aircraft that will be subjected to a delay of **10 minutes or more**. The book answer given is A (the question wording differs slightly from the regulation — the rule is 10 min, not 5 min, but per the answer key provided in the document, A is correct). [Ref: p.194]

**Q5** A so-called "Visual Approach" can be performed:

A During VFR flight, there should be a visibility of 5 km or more

B During IFR flights, if the cloudbase is 1000 ft more than the appropriate DA or MDA for that procedure

**C During IFR flights, if there is permanent sight on the movement area and the underlying ground**

✓ **Answer: C** — Visual approach is defined specifically for **IFR flights** when the approach is executed in visual reference to terrain. [Ref: p.192]

**Q6** "Time Approach Procedure" is used as necessary to expedite the approach of a number of arriving aircraft. This will be obtained requesting aircraft:

- ☐ A To maintain a specified speed during the approach procedure
- ☒ B To pass the specified point inbound at the previously notified time
- ☐ C To apply a step-down descent between aircraft in the approach sequence

✓ **Answer: B** — The "Time Approach Procedure" requires aircraft to pass the specified inbound point at the **previously notified time** to establish time-based sequencing. [Ref: p.197]

**Q7** During an arrival procedure under an IFR flight plan in VMC conditions, traffic avoidance is the responsibility of:

- ☐ A The radar controller
- ☒ B The pilot in command
- ☐ C The approach controller

✓ **Answer: B** — When cleared to maintain own separation in VMC, the **pilot in command** is responsible for traffic avoidance and maintaining own separation. [Ref: p.194]

**Q8** If the crew on an arriving aircraft approaching a controlled aerodrome reports "field in sight", a clearance for "visual approach" may be given under certain conditions:

- ☐ A The meteorological visibility must not be less than 8 km
- ☐ B The approach must be passing the FAF
- ☒ C The air traffic controller will provide separation to other controlled traffic

✓ **Answer: C** — Separation shall be provided between an aircraft cleared for visual approach and other arriving and departing aircraft. This remains the ATC's responsibility. [Ref: p.192–193]

**Q9** Which statement is correct? During a "visual approach" in controlled airspace (Class C):

- A** ATC will apply separation with other traffic
- B The pilot has to apply separation with other traffic
- C ATC will apply separation with other arriving traffic

✓ **Answer: A** — In Class C airspace, ATC shall provide separation between the visual approach aircraft and **all other controlled traffic** (both arriving and departing). [Ref: p.192]

**Q10** One-minute separation may be used between departing aircraft if they are to fly on tracks diverging by at least:

- A 30° immediately after take-off
- B 15° immediately after take-off
- C 45° immediately after take-off**

✓ **Answer: C** — The tracks must diverge by **at least 45°** immediately after take-off to provide lateral separation with only 1 minute between take-offs. [Ref: p.189]



## Quick-Reference Summary — Key Numbers

Exam Critical Values

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| Rule / Scenario                                                   | Separation / Value                        | Condition                                              |
|-------------------------------------------------------------------|-------------------------------------------|--------------------------------------------------------|
| Departing a/c — diverging tracks                                  | <b>1 minute</b>                           | Tracks diverge $\geq 45^\circ$ immediately after T/O   |
| Departing a/c — same track, speed diff                            | <b>2 minutes</b>                          | Preceding a/c $\geq 40$ kt faster, same track          |
| Departing a/c — level crossing                                    | <b>5 minutes</b>                          | Second a/c flies through level of first, same track    |
| Dep vs Arr — any direction (instrument approach)                  | <b>Before procedure turn</b>              | Until arriving a/c starts procedure/base turn          |
| Dep vs Arr — $\geq 45^\circ$ off reciprocal (instrument approach) | <b>3 min before THR</b>                   | After arriving a/c starts procedure turn               |
| Dep vs Arr — any direction (straight-in)                          | <b>5 min before THR</b>                   | Until 5 min before arriving a/c over instrument runway |
| Dep vs Arr — $\geq 45^\circ$ off reciprocal (straight-in)         | <b>3 min before THR or designated fix</b> | Straight-in approach, specific direction               |
| VMC own-separation clearance — max altitude                       | <b>3050 m / 10,000 ft</b>                 | Classes D & E, daylight only                           |
| EAT — delay trigger                                               | <b>10 min delay</b>                       | EAT to be determined and transmitted                   |
| EAT — revision trigger                                            | <b>Differs by <math>\geq 5</math> min</b> | Revised EAT transmitted without delay                  |
| EAT — expeditious transmission trigger                            | <b><math>\geq 30</math> min hold</b>      | By most expeditious means                              |
| Wind — significant headwind change                                | <b>10 kt</b>                              | Final approach, component form                         |
| Wind — significant tailwind change                                | <b>2 kt</b>                               | Final approach, component form                         |
| Wind — significant crosswind change                               | <b>5 kt</b>                               | Final approach, component form                         |

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| Rule / Scenario                          | Separation / Value | Condition                                    |
|------------------------------------------|--------------------|----------------------------------------------|
| Visual approach min visibility — Cat A/B | <b>2800 m</b>      | Minimum visibility/RVR                       |
| Visual approach min visibility — Cat C   | <b>3200 m</b>      | Minimum visibility/RVR                       |
| Visual approach min visibility — Cat D   | <b>3600 m</b>      | Minimum visibility/RVR                       |
| Visual approach — circling-only runway   | <b>5 km</b>        | Ground visibility must not be less than 5 km |

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