U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

ORDER JO 7110.126A

Effective Date:
September 28, 2019

SUBJ: Consolidated Wake Turbulence (CWT) Separation Standards

1. Purpose of This Order. This order provides procedural guidance to FAA Order JO 7110.65, Air Traffic Control, related to the use of Consolidated Wake Turbulence procedures and separation minima.

2. Audience. This order applies to all Air Traffic Organization (ATO) personnel authorized to use this order and anyone involved in the implementation and monitoring of Consolidated Wake Turbulence separation standards.

3. Where Can I Find This Order? This change is available on the FAA Website at http://faa.gov/air_traffic/publications and https://employees.faa.gov/tools_resources/orders_notices/.

4. What This Order Cancels. FAA Order JO 7110.126, Consolidated Wake Turbulence Radar Separation Standards, dated July 17, 2018, and all changes to it are cancelled.

5. Explanation of Changes.

a. This change incorporates select wake turbulence separation minima and associated phraseology from FAA Order JO 7110.65 and FAA Order JO 7110.123. RECAT Phase II separation minima between certain aircraft categories are leveraged to remove wake turbulence separation requirements wherein any Heavy aircraft follows a Lower Heavy aircraft and an Upper Small aircraft follows an Upper Large (including the B757) aircraft. These changes, and others such as replacing aircraft weight classes with aircraft wake turbulence categories in some instances, are captured in the following paragraphs: 2-1-20b., 2-4-14b. and c., 2-4-21d. and e., 3-3-5b.1., 3-7-3a. and b., 3-9-6c. through n., 3-9-7a. through b.1., 3-9-8b.3., 3-9-9c., 3-10-3b., 3-10-4c. and d., 3-10-10 NOTE-1, 3-11-1d., 4-8-11b.2., 6-1-4, 6-1-5, 6-7-5, and 7-2-1.

b. Editorial and format changes were made where necessary. Revision bars were not used to indicate any of the listed changes.

6. Requirements.

a. Facilities must receive a Letter of Authorization from the Director, Air Traffic Procedures, AJV–8, prior to the implementation of CWT procedures.

b. At facilities authorized to use this order for air traffic control services, the applicable provisions of FAA Order JO 7110.65, Air Traffic Control, are superseded by the corresponding provisions contained in this order.

c. Personnel providing air traffic control service must receive training on CWT procedures prior to implementation, or prior to assuming an operational position if the training occurs post implementation.

d. Terminal Automation Systems must have the CWT functions activated and all operational personnel appropriately trained prior to the use of this order.

e. Tower facilities must be equipped with a Flight Data Input/Output (FDIO), Electronic Flight Strip Transfer System (EFSTS), an equivalent electronic flight progress strip system, or develop manual procedures to indicate the wake category on flight progress strips.

f. Facility documents must be updated, as appropriate, to reflect CWT procedures.

g. Facilities must submit a weekly report of any wake encounter reports and Mandatory Occurrence Reports (MOR) concerning wake turbulence for the first six months after implementation.

h. Air Traffic Procedures, AJV–8, must notify Safety and Technical Training, who will in turn notify Air Traffic Safety Oversight Services (AOV) of facilities authorized to use CWT procedures and separation minima.

7. Background. Over the past several years, knowledge about wake vortex behavior in the operational environment has increased due to multiple advances in measurement techniques, available automated surveillance data, and improved understanding of physical processes. The FAA has undertaken an effort to recategorize the existing fleet of aircraft and modify the associated wake turbulence separation minima. Prior to this effort, approach and departure wake turbulence separation minima were mostly based on Maximum Certificated Gross Takeoff Weight (MCGTOW). Updates in methodology make some wake turbulence separation standards in FAA Order JO 7110.65 result in greater than necessary separation distances. For example, in some instances, Heavy-behind-Heavy separation in FAA Order JO 7110.65 is four miles. This separation is appropriate for a B767 following a B747, but not necessary when the B747 is following the B767.

FAA Order JO 7110.659 (RECAT 1.5) classified aircraft according to certificated takeoff weight, landing speed, wingspan, and the aircraft's ability to withstand a wake encounter. FAA Order JO 7110.123 (RECAT Phase II), Appendix A and Appendix B, described a pairwise separation matrix developed for the most common ICAO type identifier aircraft. Each aircraft was addressed as both a leader and a follower in each pair. The development of a pairwise separation matrix relied on wake-based data, rather than weight-based data. Separation reductions were achieved with a better understanding of wake behavior and with pairwise separation of aircraft. CWT used the most operationally advantageous separation standards from the four previous sets of standards while retaining the use of all time-based wake turbulence separation standards from FAA Order JO 7110.65. CWT is based on a nine category system that further refines the grouping of aircraft, provides throughput gains at many of today's constrained airports, and is manageable for all airports throughout the NAS.

All five sets of wake turbulence separation standards have been reviewed by Safety and Technical Training (AJI) and accepted/approved for operational use by AOV. The RECAT Phase II methodology that went into developing FAA Order JO 7110.123 determined that there is no need for wake turbulence separation for any Heavy aircraft following Lower Heavy aircraft, nor for Upper Small aircraft following Upper Large aircraft, including B757s. The goal of this revision to CWT is to incorporate these reductions in wake turbulence separation standards into sections of Chapter 3 and Chapter 6 in an effort to capitalize on operational efficiencies while continuing to provide throughput gains at many of the airports throughout the NAS.

Natking Estevez
Director (A), Air Traffic Procedures

8/28/19
Date

Appendix A

Aircraft Wake Categories

Category A – A388.

Category B – Pairwise Upper Heavy aircraft.

Category C – Pairwise Lower Heavy aircraft

Category D – Non-Pairwise Heavy aircraft.

Category E – B757 aircraft.

Category F – Upper Large aircraft excluding B757 aircraft.

Category G – Lower Large aircraft.

Category H – Upper Small aircraft with a maximum takeoff weight of more than 15,400 pounds up to 41,000 pounds.

Category I – Lower Small aircraft with a maximum takeoff weight of 15,400 pounds or less.

TBL A–1

Aircraft Types Categorized

A Super	B Upper Heavy	C Lower Heavy	D Non-Pairwise Heavy		E B757	F Upper Large		G Lower Large		H Upper Small	I Lower Small
A388	A332	A306	A124	DC85	B752	A318	C130	AT43	E170	ASTR	BE10
	A333	A30B	A339	DC86	B753	A319	C30J	AT72	E45X	B190	BE20
	A343	A310	A342	DC87		A320	CVLT	CL60	E75L	BE40	BE58
	A345	B762	A3ST	E3CF		A321	DC93	CRJ1	E75S	B350	BE99
	A346	B763	A400	E3TF		B712	DC95	CRJ2	F16	C560	C208
	A359	B764	A50	E6		B721	DH8D	CRJ7	F18H	C56X	C210
	B742	C17	AN22	E767		B722	E190	CRJ9	F18S	C680	C25A
	B744	DC10	B1	IL62		B732	GL5T	CRJX	F900	C750	C25B
	B748	K35R	B2	IL76		B733	GLEX	DC91	FA7X	CL30	C402
	B772	MD11	B52	IL86		B734	GLF5	DH8A	GLF2	E120	C441
	B773		B703	IL96		B735	GLF6	DH8B	GLF3	F2TH	C525
	B77L		B741	K35E		B736	MD82	DH8C	GLF4	FA50	C550
	B77W		B743	KE3		B737	MD83	E135	SB20	GALX	P180
	B788		B74D	L101		B738	MD87	E145	SF34	H25B	PAY2
	B789		B74R	MYA4		B739	MD88			LJ31	PA31
	C5		B74S	R135			MD90			LJ35	PC12
	C5M		B78X	T144						LJ45	SR22
			BLCF	T160						LJ55	SW3
			BSCA	TU95						LJ60	
			C135	VMT						SH36	
			C141							SW4	

NOTE –

1. *The A225 is treated as a NOWGT aircraft.*

2. *TBL A-1 lists the most common aircraft for all Wake Categories, and is not an all-inclusive list. However, aircraft automation databases list all aircraft that have been assigned an aircraft type designator. Entering the appropriate aircraft type designator will allow automation systems such as Standard Terminal Automation Replacement System (STARS) and Airport Surface Detection Equipment Model X (ASDE-X) to display the appropriate aircraft wake category for all assigned aircraft.*

Appendix B

Amend the following paragraphs in FAA Order JO 7110.65:

2–1–20. WAKE TURBULENCE CAUTIONARY ADVISORIES

Title through **a.3.**, No Change

b. Issue cautionary information to any aircraft if in your opinion wake turbulence may have an adverse effect on it. When traffic is known to be a Category A aircraft, include the word *Super* in the description. When traffic is known to be a Category B, C, or D aircraft, include the word *Heavy* in the description.

NOTE–
Wake turbulence is generated when an aircraft produces lift. Because the location of wake turbulence is difficult to determine, the controller is not responsible for anticipating its existence or effect. Aircraft flying through a Super/Heavy aircraft's flight path may have an increased chance of a wake encounter.

REFERENCE–
AC 90-23, Aircraft Wake Turbulence.
P/CG Term – Aircraft Wake Categories.
P/CG Term –Wake Turbulence.

No further changes to paragraph

2–3–4. TERMINAL DATA ENTRIES

Title through ***TBL 2-3-3***, block 2A, No Change

TBL 2-3-3

Block	Information Recorded
3.	Number of aircraft if more than one, aircraft wake category indicator, type of aircraft, and aircraft equipment suffix.

TBL 2–3–3, block 4 through ***TBL 2–3–4***, block 2A, No Change

TBL 2-3-4

Block	Information Recorded
3.	Number of aircraft if more than one, aircraft wake category indicator, type of aircraft, and aircraft equipment suffix.

TBL 2–3–4, block 4 through ***TBL 2–3–5***, block 2A, No Change

TBL 2-3-5

Block	Information Recorded
3.	Number of aircraft if more than one, aircraft wake category indicator, type of aircraft, and aircraft equipment suffix.

No further changes to paragraph

2–4–14. WORDS AND PHRASES

Title through **a.**, No Change

b. The word *Super* must be used as part of the identification in all communications with or about Category A aircraft.

c. The word *Heavy* must be used as part of the identification in all communications with or about Category B, C, or D aircraft.

No further changes to paragraph

2–4–21. DESCRIPTION OF AIRCRAFT TYPES

Except for Category A, B, C, and D aircraft, describe aircraft as follows when issuing traffic information:

a. through **c.2.** ***Example***, No Change

d. When issuing traffic information to aircraft following a Category A aircraft, specify the word *Super* before the manufacturer's name and model.

EXAMPLE−
"Super A-Three-Eighty" or "Super A-Three-Eighty-Eight."

e. When issuing traffic information to aircraft following a Category B, C, or D aircraft, specify the word *Heavy* before the manufacturer's name and model.

EXAMPLE–
"Heavy C-Seventeen."

"Heavy Boeing Seven Forty-Seven."

No further changes to paragraph

3–3–5. BRAKING ACTION ADVISORIES

Title through **b.**, No Change

1. Issue the latest braking action report for the runway in use to each arriving and departing aircraft early enough to be of benefit to the pilot. When possible, include reports from Category A, B, C, or D aircraft when the arriving or departing aircraft is a Category A, B, C, or D aircraft.

No further changes to paragraph

3–7–3. GROUND OPERATIONS

WAKE TURBULENCE APPLICATION

Avoid clearances which require:

a. Category A, B, C, or D aircraft to use greater than normal taxiing power.

b. Category H and I aircraft or helicopters to taxi in close proximity to taxiing or hover-taxi helicopters.

NOTE−
Use caution when taxiing smaller aircraft/helicopters in the vicinity of larger aircraft/helicopters. Controllers may use the words "rotor wash", "jet blast", or "prop wash" when issuing cautionary advisories.

EXAMPLE−
"Follow Boeing 757, Runway Three-Six Left, taxi via Alpha. Caution jet blast."

or

When appropriate,

"Follow CH-53, Runway Two-One, taxi via Bravo. Caution rotor wash."

REFERENCE−
AC 90−23, Aircraft Wake Turbulence, Para 10 and Para 11.

No further changes to paragraph

3–9–6. SAME RUNWAY SEPARATION

Title through WAKE TURBULENCE APPLICATION, No Change

c. Do not issue clearances which imply or indicate approval of rolling takeoffs by Category A, B, C, or D aircraft except as provided in Paragraph 3−1−14, Ground Operations When Volcanic Ash is Present.

d. Do not issue clearances to a Category H or I aircraft to line up and wait on the same runway behind a departing Category A, B, C, or D aircraft to apply the necessary intervals.

REFERENCE−
AC 90−23, Aircraft Wake Turbulence.

e. The minima in Paragraph 5−5−4, Minima, subparagraph g, TBL 5-5-1 may be applied in lieu of the time interval requirements in subparagraphs f, g, and h. When Paragraph 5−5−4 TBL 5-5-1 minima is applied, ensure that the appropriate radar separation exists at or prior to the time an aircraft becomes airborne.

REFERENCE−
FAA Order JO 7210.3, Para 2–1–16, Authorization for Separation Services by Towers.
FAA Order JO 7210.3, Para 10–5–3, Functional Use of Certified Tower Radar Displays.

NOTE−
1. *The pilot may request additional separation, but should make this request before taxiing on the runway.*

2. *Takeoff clearance to the following aircraft should not be issued until the time interval has passed after the preceding aircraft begins takeoff roll.*

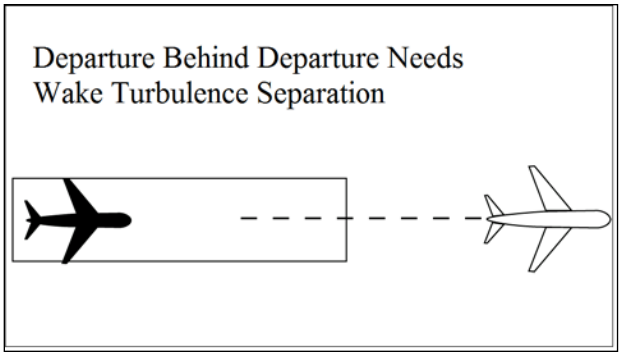
f. Separate aircraft taking off from the same runway or a parallel runway separated by less than 2,500 feet (See FIG 3−9−4):

1. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – 3 *minutes.*

2. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – 2 *minutes.*

3. Category E, F, G, H, or I aircraft behind Category C aircraft – 2 *minutes.*

FIG 3–9–4
Same Runway Separation



g. Separate Category I aircraft behind Category E aircraft by *2 minutes* when departing:

1. The same runway or a parallel runway separated by less than 700 feet. (See FIG 3–9–5 and FIG 3–9–6.)

FIG 3–9–5
Same Runway Separation

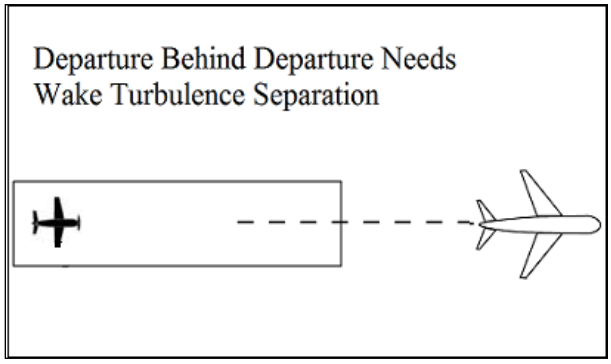
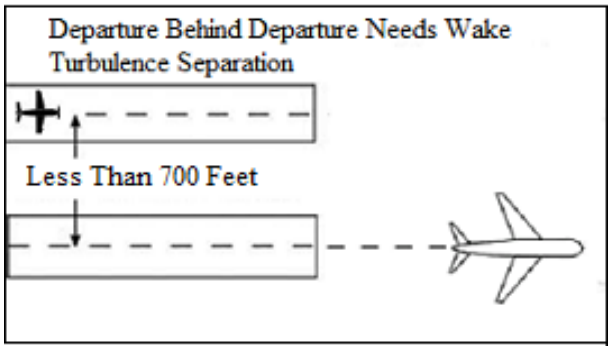
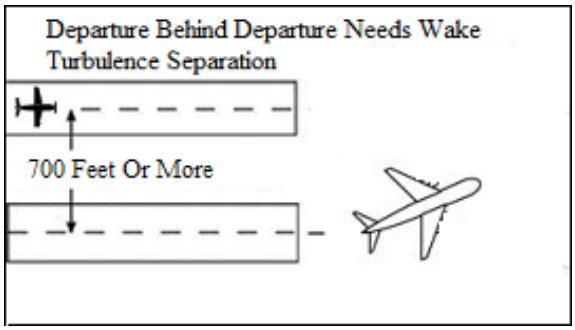


FIG 3–9–6
Parallel Runway Separated by Less than 700 Feet



2. A parallel runway separated by 700 feet or more, if flight paths will cross. (See FIG 3–9–7.)

FIG 3–9–7
Parallel Runway Separated by 700 Feet or More Projected Flight Paths Cross



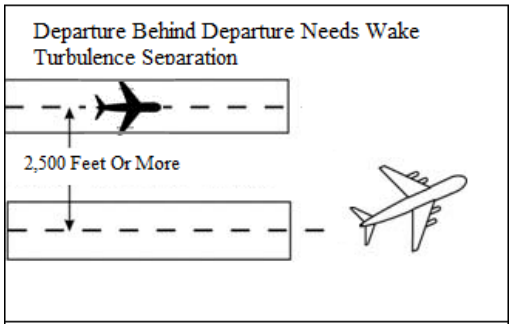
h. Separate aircraft departing from a parallel runway separated by 2,500 feet or more if projected flight paths will cross (See FIG 3−9−8):

1. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – *3 minutes.*

2. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – 2 *minutes.*

3. Category E, F, G, H, or I aircraft behind Category C aircraft – 2 *minutes.*

FIG 3–9–8
Parallel Runways Separated by 2,500 Feet or More



i. Separate aircraft when operating on a runway with a displaced landing threshold if projected flight paths will cross, when either a departure follows an arrival or an arrival follows a departure by the following minima:

1. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – 3 *minutes*.

2. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft - *2 minutes*.

3. Category E, F, G, H, or I aircraft behind Category C aircraft - *2 minutes*.

4. Category I aircraft behind Category E aircraft – *2 minutes*.

j. Separate an aircraft behind another aircraft that has departed or made a low/missed approach when utilizing opposite direction takeoffs or landings on the same or parallel runways separated by less than 2,500 feet by the following minima:

1. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – 4 *minutes*.

2. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft - 3 *minutes*.

3. Category E, F, G, H, or I aircraft behind Category C aircraft - 3 *minutes*.

k. Separate a Category I aircraft behind a Category E aircraft that has departed or made a low/missed approach by *3 minutes* when utilizing opposite direction takeoffs or landings from:

1. The same runway or a parallel runway separated by less than 700 feet.

2. A parallel runway separated by 700 feet or more if projected flight paths will cross.

l. Do not approve pilot requests to deviate from the required intervals contained in subparagraphs f through k.

PHRASEOLOGY–
HOLD FOR WAKE TURBULENCE.

REFERENCE–
FAA Order JO 7110.126, Para 3−9−7, Wake Turbulence Separation for Intersection Departures.

m. Separate a Category I aircraft behind a Category F or G aircraft that has departed or made a low/missed approach when utilizing opposite direction takeoffs on the same runway by *3 minutes* unless a pilot has initiated a request to deviate from the time interval. In the latter case, issue a wake turbulence cautionary advisory before clearing the aircraft for takeoff. Controllers must not initiate or suggest a waiver of the time interval.

NOTE–
A request for takeoff does not initiate a waiver request.

n. Inform aircraft when it is necessary to hold in order to provide the required time interval.

3–9–7. WAKE TURBULENCE SEPARATION FOR INTERSECTION DEPARTURES

a. Apply the following wake turbulence criteria for intersection departures:

1. Separate a Category I aircraft taking off from an intersection on the same runway (same or opposite direction takeoff) behind a departing Category H aircraft by ensuring that the aircraft does not start takeoff roll until at least *3 minutes* after the preceding aircraft has taken off.

2. Separate a Category I aircraft taking off from an intersection on the same runway (same or opposite direction takeoff) behind a departing Category F or G aircraft by ensuring that the aircraft does not start takeoff roll until at least *3 minutes* after the preceding aircraft has taken off.

3. Separate a Category I aircraft taking off from an intersection (same or opposite direction takeoff) behind a preceding departing Category E aircraft by ensuring that the aircraft does not start takeoff roll until at least *3 minutes* after the Category E aircraft has taken off from:

(a) The same runway or a parallel runway separated by less than 700 feet.

(b) Parallel runways separated by 700 feet or more, or parallel runways separated by 700 feet or more with the runway thresholds offset by 500 feet or more, if projected flight paths will cross.

4. Separate aircraft departing from an intersection on the same runway (same or opposite direction takeoff), parallel runways separated by less than 2,500 feet, and parallel runways separated by less than 2,500 feet with the runway thresholds offset by 500 feet or more, by ensuring that the aircraft does not start take-off roll until the following intervals exist after the preceding aircraft has taken off:

(a) Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – *4 minutes*.

(b) Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – *3 minutes*.

(c) Category E, F, G, H, or I aircraft behind Category C aircraft – *3 minutes*.

NOTE–
Apply Para 3-9-6, Same Runway Separation, subpara f, to parallel runways separated by less than 2,500 feet with runway thresholds offset by less than 500 feet.

5. Inform aircraft when it is necessary to hold in order to provide the required time interval.

PHRASEOLOGY–
HOLD FOR WAKE TURBULENCE.

NOTE–
Aircraft conducting touch-and-go and stop-and-go operations are considered to be departing from an intersection.

REFERENCE–
FAA Order JO 7110.65, Para 3−8−2, Touch−and−Go or Stop−and−Go or Low Approach.

b. The time interval is not required when:

1. A pilot has initiated a request to deviate from the time intervals contained in subparagraph a.1 or a.2.

NOTE–
A request for takeoff does not initiate a waiver request; the request for takeoff must be accomplished by a request to deviate from the time interval.

b.2. through **b.3.**, No Change

NOTE–
Not authorized with a Category A aircraft as the lead or departure aircraft.

No further changes to paragraph

3–9–8. INTERSECTING RUNWAY/INTERSECTING FLIGHT PATH OPERATIONS

Title through WAKE TURBULENCE APPLICATION, No Change.

3. Separate an aircraft taking off behind a landing or departing aircraft on an intersecting runway if flight paths will cross (See FIG 3–9–11 and FIG 3–9–12.):

(a) Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – *3 minutes*.

(b) Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – 2 *minutes*.

(c) Category E, F, G, H, or I aircraft behind Category C aircraft – *2 minutes.*

(d) Category I aircraft behind Category E aircraft – *2 minutes*.

FIG 3–9–11
Departure Behind Departure on Intersecting Runway

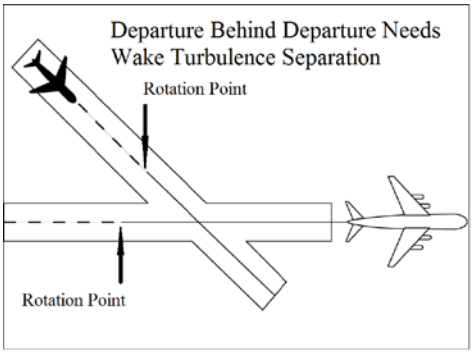
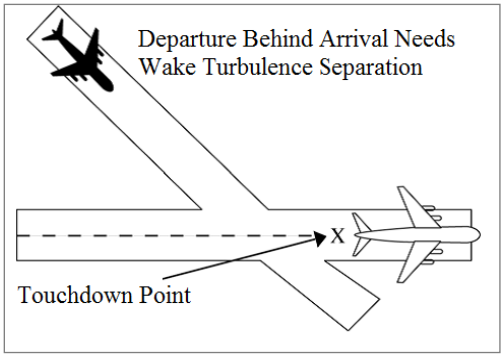


FIG 3–9–12
Departure Behind Arrival on Intersecting Runway



No further changes to paragraph

3–9–9. NONINTERSECTING CONVERGING RUNWAY OPERATIONS

Title thru WAKE TURBULENCE APPLICATION, No Change

c. Separate aircraft taking off behind a landing or departing aircraft on a converging runway if projected flight paths will cross (See FIG 3–9–18 and 3–9–19):

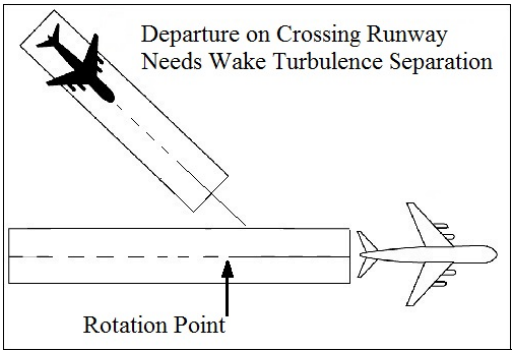
1. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – *3 minutes*.

2. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – 2 *minutes*.

3. Category E, F, G, H, or I aircraft behind Category C aircraft – *2 minutes*.

4. Category I aircraft behind Category E aircraft – *2 minutes*.

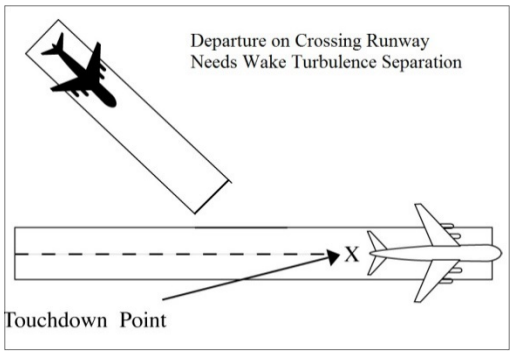
FIG 3–9–18
Converging Runway Separation



NOTE–
Takeoff clearance to the following aircraft should not be issued until the time interval has passed from when the preceding aircraft began takeoff roll.

Subparagraph **d**, delete

FIG 3–9–19
Converging Runway Separation



No further changes to paragraph

3–10–3. SAME RUNWAY SEPARATION

Title through WAKE TURBULENCE APPLICATION, No Change

b. Issue wake turbulence advisories, and the position, altitude if known, and the direction of flight of departing or arriving aircraft on the same runway or parallel runways separated by less than 2,500 feet to:

1. Category B, C, D, E, F, G, H, and I aircraft behind Category A, B, or D aircraft.

2. Category E, F, G, H, or I aircraft behind Category C aircraft.

3. Category I aircraft behind Category E aircraft.

REFERENCE−
AC 90−23, Aircraft Wake Turbulence, Para 12, Pilot Responsibility.
FAA Order JO 7110.65, Para 3−10−10, Altitude Restricted Low Approach.

EXAMPLE−
1. "*Runway two seven left cleared to land, caution wake turbulence, heavy Boeing 747 departing runway two seven right."*

2. *"Number two follow Boeing 757 on 2-mile final. Caution wake turbulence."*

3. *"Traffic, Boeing 737 on 2−mile final to the parallel runway, runway two six right, cleared to land. Caution wake turbulence."*

No further changes to paragraph.

3–10–4. INTERSECTING RUNWAY/INTERSECTING FLIGHT PATH SEPARATION

Title through WAKE TURBULENCE APPLICATION, No Change.

c. Separate aircraft landing behind a departing aircraft on a crossing runway if the arrival will fly through the airborne path of the departure by the appropriate radar separation or the following intervals: (See FIG 3–10–10):

1. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – 3 *minutes*.

2. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – 2 *minutes*.

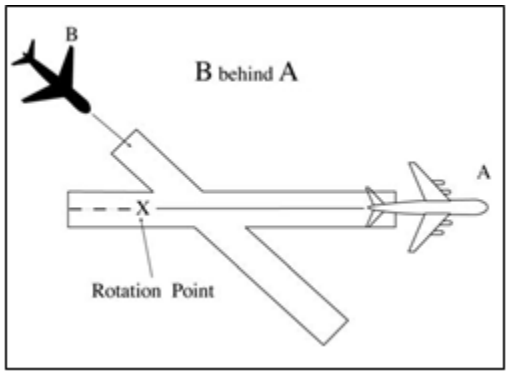
3. Category E, F, G, H, or I aircraft behind Category C aircraft – *2 minutes*.

4. Category I aircraft behind Category E aircraft – *2 minutes*.

d. Issue wake turbulence cautionary advisories including the position, altitude if known, and direction of flight of Category A, B, C, D, or E aircraft to:

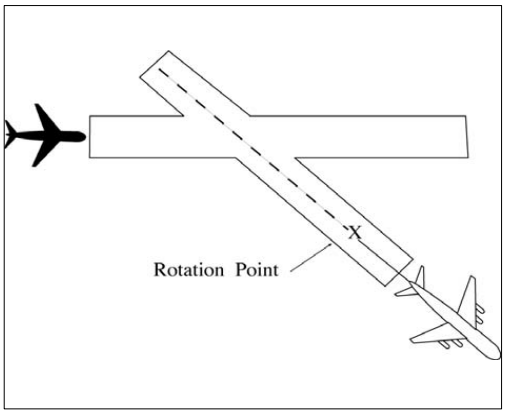
REFERENCE -
AC 90−23, Aircraft Wake Turbulence, Para 11, Pilot Responsibility.

FIG 3–10–10
Intersecting Runway Separation



1. Aircraft landing on a crossing runway behind a departing aircraft that requires wake turbulence separation behind it if the arrival flight path will cross the takeoff path behind the departing aircraft rotation point. (See FIG 3–10–11.)

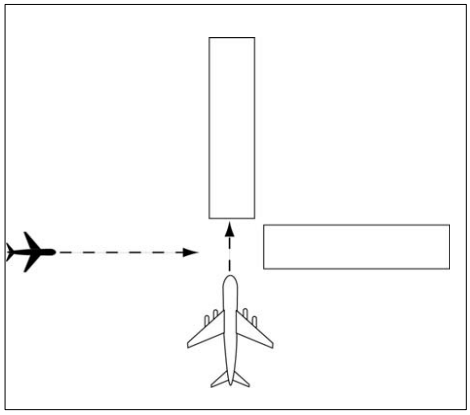
FIG 3–10–11
Intersecting Runway Separation



EXAMPLE–
“Runway niner cleared to land. Caution wake turbulence, Heavy C−Seventeen departing runway one five.”

2. All VFR aircraft landing on a crossing runway behind an arriving Category A, B, C, or D aircraft and VFR Category I aircraft landing on a crossing runway behind a Category E aircraft, if the arrival flight paths will cross. (See FIG 3-10-12.)

FIG 3–10–12
Intersecting Runway Separation



EXAMPLE−
"Runway niner cleared to land. Caution wake turbulence, Boeing Seven Fifty Seven landing runway three six."

REFERENCE
FAA Order JO 7110.65, Para 7-4-4, Approaches to Multiple Runways.

No further changes to paragraph

3–10–10. ALTITUDE RESTRICTED LOW APPROACH

Title to ***NOTE-1***, No Change

NOTE−
1. *The 500 feet restriction is a minimum. Higher altitudes should be used when warranted. For example, 1,000 feet is more appropriate for Category A, B, C, or D aircraft operating over unprotected personnel or Category H or I aircraft on or near the runway.*

No further changes to paragraph

3–11–1. TAXI AND GROUND MOVEMENT OPERATION

Title through WAKE TURBULENCE APPLICATION, No Change

d. Avoid clearances that require Category H or I aircraft or helicopters to taxi in close proximity to taxiing or hover-taxi helicopters.

No further changes to paragraph

4–8–11. PRACTICE APPROACHES

Title through **a.1.(b)**, No Change

2. Where procedures require application of IFR separation to VFR aircraft practicing instrument approaches, IFR separation in accordance with Chapters 3 through 7 must be provided. Controller responsibility for separation begins at the point where the approach clearance becomes effective. Except for Category A, B, C, or D aircraft, 500 feet vertical separation may be applied between VFR aircraft and between a VFR and an IFR aircraft.

REFERENCE–
FAAO JO 7110.126, Para 5-5-4, Minima, Subparagraphs g and h.
FAAO JO 7210.3, Para 6-4-4, Practice Instrument Approaches.
FAAO JO 7210.3, Para 10-4-5, Practice Instrument Approaches.

No further changes to paragraph

5–5–4. MINIMA

Title through **a.4.**, No Change

NOTE–
Wake turbulence procedures specify increased separation minima required for certain categories of aircraft because of the possible effects of wake turbulence.

b. through **f.** ***NOTE 3***, No Change

WAKE TURBULENCE APPLICATION

g. Separate aircraft by the minima specified in TBL 5–5–1 in accordance with the following:

1. When operating within 2,500 feet and less than 1,000 feet below the flight path of the leading aircraft over the surface of the earth of a Category A, B, C, or D aircraft.

2. When operating within 2,500 feet and less than 500 feet below the flight path of the leading aircraft over the surface of the earth of a Category E aircraft.

3. When departing parallel runways separated by less than 2,500 feet, the 2,500 feet requirement in subparagraph 2 is not required when a Category I aircraft departs the parallel runway behind a Category E aircraft. Issue a wake turbulence cautionary advisory and instructions that will establish lateral separation in accordance with subparagraph 2. Do not issue instructions that will allow the Category I aircraft to pass behind the Category E aircraft.

NOTE–
1. *The application of paragraph 5–8–3, Successive or Simultaneous Departures, satisfies this requirement.*

2. *Consider runways separated by less than 700 feet as a single runway because of the possible effects of wake turbulence.*

REFERENCE–
FAA Order JO 7110.65, Para 3–9–6, Same Runway Separation.

TBL 5–5–1
Wake Turbulence Separation for Directly Behind

		Follower								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Leader	**A**		4.5 NM	6 NM	6 NM	7 NM	7 NM	7 NM	7 NM	8 NM
	B		3 NM	4 NM	4 NM	5 NM	5 NM	5 NM	5 NM	5 NM
	C					3.5 NM	3.5 NM	3.5 NM	5 NM	5 NM
	D		3 NM	4 NM	4 NM	5 NM	5 NM	5 NM	5 NM	5 NM
	E									4 NM
	F									
	G									
	H									
	I									

h. *ON APPROACH.* In addition to subparagraph g, separate an aircraft on approach behind another aircraft to the same runway by ensuring the separation minima in TBL 5–5–2 will exist at the time the preceding aircraft is over the landing threshold.

NOTE–
Consider parallel runways less than 2,500 feet apart as a single runway because of the possible effects of wake turbulence.

TBL 5–5–2
Wake Turbulence Separation for On Approach

		Follower								
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Leader	**A**		4.5 NM	6 NM	6 NM	7 NM	7 NM	7 NM	7 NM	8 NM
	B		3 NM	4 NM	4 NM	5 NM	5 NM	5 NM	5 NM	6 NM
	C					3.5 NM	3.5 NM	3.5 NM	5 NM	6 NM
	D		3 NM	4 NM	4 NM	5 NM	5 NM	5 NM	6 NM	6 NM
	E									4 NM
	F									4 NM
	G									
	H									
	I									

i., No Change

j. *TERMINAL*. 2.5 nautical miles (NM) separation is authorized between aircraft established on the final approach course within 10 NM of the landing runway when operating in single sensor slant range mode and aircraft remain within 40 miles of the antenna, and:

1. Wake turbulence separation must be applied in accordance with TBL 5–5–2;

2. An average runway occupancy time of 50 seconds or less is documented;

3. CTRDs are operational and used for quick glance references;

REFERENCE–
FAA Order JO 7110.65, Para 3−1−9, Use of Tower Radar Displays.

4. Turnoff points are visible from the control tower.

No further changes to paragraph

5–8–3. SUCCESSIVE OR SIMULTANEOUS DEPARTURES

TERMINAL

Except for when wake turbulence separation is required, separate aircraft departing from the same airport/heliport or adjacent airports/heliports in accordance with the following minima provided radar identification with the aircraft will be established within 1 mile of the takeoff runway end/helipad and courses will diverge by 15 degrees or more.

REFERENCE–
FAA Order JO 7110.65, Para 3–9–7, Wake Turbulence Separation for Intersection Departures.
FAA Order JO 7110.65, Para 3–9–8, Intersecting Runway/Intersecting Flight Path Operations.
FAA Order JO 7110.65, Para 5–5–4, Minima, Subparagraph g.

NOTE 1 through ***FIG 5–8–3***, No Change

FIG 5–8–3 NOTE, ***REFERENCES***, Delete

b. through ***FIG 5–8–5***, No Change

FIG 5–8–5 NOTE, Delete

No further changes to paragraph

6–1–4. ADJACENT AIRPORT OPERATION

TERMINAL

WAKE TURBULENCE APPLICATION

The ATC facility having control jurisdiction at adjacent airports must separate arriving or departing IFR aircraft on a course that will cross the flight path of an aircraft requiring wake turbulence separation in accordance with the following:

a. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – *3 minutes*.

b. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – 2 *minutes*.

c. Category E, F, G, H, or I aircraft behind Category C aircraft – *2 minutes*.

d. Category I aircraft behind Category E aircraft – *2 minutes*.

FIG 6-1-1
Adjacent Airport Operation – Arrival

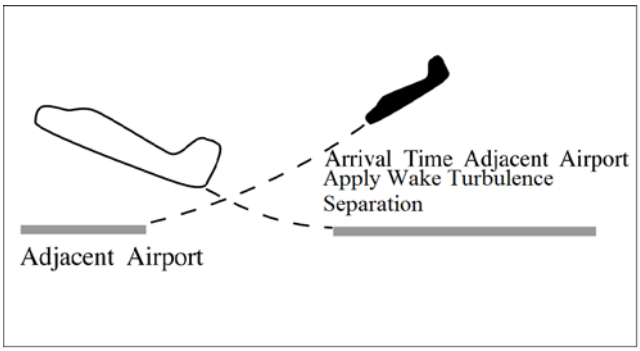
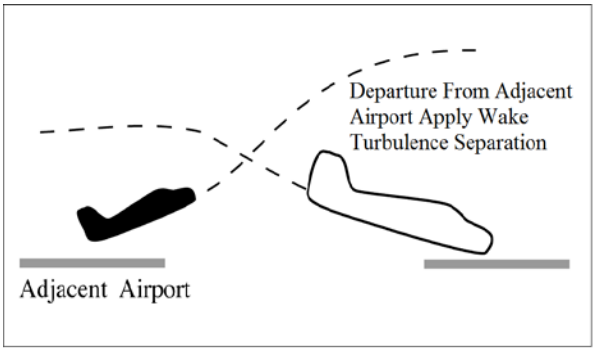


FIG 6-1-2
Adjacent Airport Operation – Departure



6–1–5. ARRIVAL MINIMA

TERMINAL

WAKE TURBULENCE APPLICATION

a. Separate IFR aircraft landing behind other arriving aircraft to the same runway, a parallel runway separated by less than 2,500 feet, or a crossing runway if projected flight paths will cross:

1. Category B, C, D, E, F, or G aircraft behind Category A aircraft – *3 minutes*.

2. Category H or I aircraft behind Category A aircraft – *4 minutes*.

3. Category B, C, D, E, F, or G aircraft behind Category B or D aircraft – 2 *minutes*.

4. Category E, F, or G aircraft behind Category C aircraft – *2 minutes*.

5. Category H or I aircraft behind Category B, C, or D aircraft – *3 minutes*.

6. Category I aircraft behind Category E aircraft – *3 minutes*.

b. Separate IFR aircraft landing behind an arriving aircraft to a parallel runway separated by less than 2,500 feet, or a crossing runway if projected flight paths will cross:

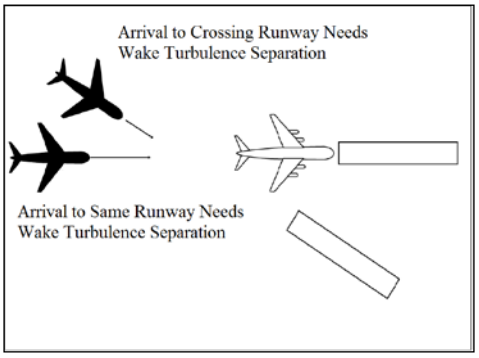
1. Category B, C, D, E, F, G, H, or I aircraft behind Category A aircraft – *3 minutes*.

2. Category B, C, D, E, F, G, H, or I aircraft behind Category B or D aircraft – 2 *minutes*.

3. Category E, F, G, H, or I aircraft behind Category C aircraft – *2 minutes*.

4. Category I aircraft behind Category E aircraft – *2 minutes*.

FIG 6–1–3
Arrival Minima Landing Behind an Arriving Aircraft Requiring Wake Turbulence Separation



6–7–5. INTERVAL MINIMA

a. Except as provided in subparagraph b, use a *2–minute* or *5–mile* radar interval as the minimum between successive approaches.

REFERENCE–
FAA Order JO 7110.65, Para 5−9−5, Approach Separation Responsibility.
FAA Order JO 7110.65, Para 6−7−1, Application.
FAA Order JO 7110.65, Para 6−7−2, Approach Sequence.

WAKE TURBULENCE APPLICATION

b. Use the following times or radar intervals as the minimum:

1. Behind Category A aircraft:

(a) Category B, C, or D aircraft – *3 minutes* or *6 miles.*

(b) Category E, F, or G aircraft – *3 minutes* or *7 miles.*

(c) Category H or I aircraft – *4 minutes or 8 miles.*

2. Category H or I aircraft behind Category B, C, or D aircraft – *3 minutes* or *6 miles.*

c. Increase the interval as necessary, considering the following:

1. Relative speeds of the aircraft concerned.

2. Existing weather conditions.

3. Distance between the approach fix and the airport.

4. Type of approach being made.

No further changes to paragraph

7–2–1. VISUAL SEPARATION

Visual separation may be applied when other approved separation is assured before and after the application of visual separation. To ensure that other separation will exist, consider aircraft performance, wake turbulence, closure rate, routes of flight, known weather conditions, and aircraft position. Weather conditions must allow the aircraft to remain within sight until other separation exists. Visual separation is not authorized when the lead aircraft is a Category A aircraft.

REFERENCE–
FAA Order JO 7110.126, Para 2−1−20, Wake Turbulence Cautionary Advisories.
FAA Order JO 7110.65, Para 2−1−21, Traffic Advisories.
FAA Order JO 7110.65, Para 3−1−9, Use of Tower Radar Displays.
FAA Order JO 7110.65, Para 5−9−5, Approach Separation Responsibility.
FAA Order JO 7110.65, Para 7−4−1, Visual Approach.
FAA Order JO 7110.65, Para 7−4−2, Vectors for Visual Approach.
FAA Order JO 7110.65, Para 7−4−4, Approaches to Multiple Runways.
FAA Order JO 7210.3, Para 4−3−2, Appropriate Subjects.
FAA Order JO 7210.3, Para 10−3−9, Visual Separation.
P/CG Term− Visual Approach.
P/CG Term− Visual Separation.

No further changes to paragraph

7–4–3. CLEARANCE FOR VISUAL APPROACH

Title through **c.3.** ***NOTE***, No Change

d. Inform the trailing aircraft of the lead aircraft's manufacturer and/or model when wake turbulence separation is required.

EXAMPLE–
"Cessna Three Four Juliet, following a heavy Boeing 747, 12 o'clock, seven miles."

or

"Cessna Three Four Juliet, following a Seven-Fifty-Seven, 12 o'clock, four miles."

REFERENCE–
FAA Order JO 7110.65, Para.2−4−21, Description of Aircraft Types.
FAA Order JO 7110.65, Para 5–5–4, Minima, Subparagraph g.

NOTE--
Visual separation is not authorized when the lead aircraft is a Category A aircraft.

REFERENCE–
FAA Order JO 7110.65, Para 7–2–1, Visual Separation.

No further changes to paragraph

7–4–4. APPROACHES TO MULTIPLE RUNWAYS

Title through **c.**, No Change

c. In addition to the requirements in Paragraph 7−2−1, Visual Separation, Paragraph 7−4−1, Visual Approach, Paragraph 7−4−2, Vectors for Visual Approach, and Paragraph 7−4−3, Clearance for Visual Approach, the following conditions apply to visual approaches being conducted simultaneously to parallel, intersecting, and converging runways, as appropriate:

1. Parallel runways separated by less than 2,500 feet. Unless approved separation is provided by ATC, an aircraft must report sighting a preceding aircraft making an approach (instrument or visual) to the adjacent parallel runway. When an aircraft reports another aircraft in sight on the adjacent final approach course and visual separation is applied, controllers must advise the succeeding aircraft to maintain visual separation. Do not permit an aircraft to overtake another aircraft when wake turbulence separation is required.

NOTE–
Visual separation is not authorized when the lead aircraft is a Category A aircraft.

REFERENCE–
FAA Order JO 7110.65, Para 5–5–4, Minima, Subparagraph g.
FAA Order JO 7110.65, Para 7–2–1, Visual Separation.

No further changes to paragraph

7–6–7. SEQUENCING

Title through **c.1.**, No Change

2. When parallel runways are less than 2,500 feet apart, do not permit an aircraft to overtake another aircraft established on final within the facility's area of responsibility when wake turbulence separation is required.

REFERENCE–
FAA Order JO 7110.65, Para 5–5–4, Minima, Subparagraph g.