

Safe Landing Guidelines

The risk of an approach-and-landing accident is increased if any of the following guidelines is not met. If more than one guideline is not met, the overall risk is greatly increased.

1. Fly a stabilized approach.¹
2. Height at threshold crossing is 50 ft.
3. Speed at threshold crossing is not more than $V_{REF} + 10$ kt indicated airspeed and not less than V_{REF} .
4. Tail wind is no more than 10 kt for a non-contaminated runway, no more than 0 kt for a contaminated runway.
5. Touch down on runway centerline at the touchdown aim point.²
6. After touchdown, promptly transition to the desired deceleration configuration:
 - Brakes
 - Spoilers/speed brakes
 - Thrust reversers or equivalent (e.g., lift dump)

Note: Once thrust reversers have been activated, a go-around is no longer an option.
7. Speed is less than 80 kt with 2,000 ft of runway remaining.

Notes

1. The FSF Approach-and-Landing Accident Reduction (ALAR) Task Force developed the following recommended elements of a stabilized approach:

All flights must be stabilized by 1,000 ft above airport elevation in instrument meteorological conditions (IMC) and by 500 ft above airport elevation in visual meteorological conditions (VMC). An approach is stabilized when all of the following criteria are met:

- The aircraft is on the correct flight path.
 - Only small changes in heading/pitch are required to maintain the correct flight path.
 - The aircraft speed is not more than $V_{REF} + 20$ kt indicated airspeed and not less than V_{REF} .
 - The aircraft is in the correct landing configuration.
 - Sink rate is no greater than 1,000 fpm; if an approach requires a sink rate greater than 1,000 fpm, a special briefing should be conducted.
 - Power setting is appropriate for the aircraft configuration and is not below the minimum power for approach as defined in the aircraft operating manual.
 - All briefings and checklists have been conducted.
- Specific types of approaches are stabilized if they also fulfill the following: instrument landing system (ILS) approaches must be flown within one dot of the glideslope and localizer; during a circling approach, wings should be level on final when the aircraft reaches 300 ft above airport elevation.
 - Unique approach procedures or abnormal conditions requiring a deviation from the above elements of a stabilized approach require a special briefing.

An approach that becomes unstabilized below 1,000 ft above airport elevation in IMC or below 500 ft above airport elevation in VMC requires an immediate go-around.

2. *Touchdown aim point* is defined by the U.S. Federal Aviation Administration as 1,000 ft from the runway threshold. The International Civil Aviation Organization defines *touchdown aim point* in reference to the available landing area, as follows:

| Available landing area | < 800 m | 800–1,200 m | 1,200–2,400 m | > 2,400 m |
|------------------------|---------|-------------|---------------|-----------|
| Touchdown aim point | 150 m | 250 m | 300 m | 400 m |

Touchdown aim point markings are 150-ft-long white rectangular stripes, one on each side of the runway centerline, that begin at the distances indicated above. The width of the aim-point markings varies with the width of the runway.