

“still air” vs. “probable wind” and “most favorable” vs. “most suitable.”) *FAA Response:* The FAA has studied the discussion in the NPRM preamble, the comments received on proposed § 91.1037 and the proposed changes to § 135.385, the background of the runway limitations for various types of operations, and the relationship between the performance rules in the certification standards and the landing and takeoff requirements in the operating rules. Based on this review, the FAA has decided to modify the proposed 85 percent requirement and to withdraw the proposal to allow a higher takeoff weight than would be permitted

under the 85 percent standard if the operator prepares an approved Destination Airport Analysis. The FAA has determined that the arguments presented in the NPRM preamble for reducing the current part 135 safety margins indicate a misconception regarding the basis and evolution of the current landing distance requirements. The landing distance margin requirements contained in the operating rules applicable to large transport category airplanes are intended to take into account those items that are not included or are not fully addressed in the part 25 airplane type certification landing distance

requirements used to determine the landing distances provided in Airplane Flight Manuals. These factors include steady-state variables that are not required to be taken into account in the landing distances determined under part 25, differences in operational procedures and techniques used in actual operations from those used in determining the part 25 landing distances, non steady-state variables, and differences in the conditions forecast at dispatch and those existing at the time of landing. Examples of each of these categories include:

Steady-state variables	Non steady-state variables	Actual operations vs. flight test	Actual vs. forecast conditions
Runway slope .....	Wind gusts/turbulence .....	Flare technique .....	Runway or direction (affecting slope).
Temperature .....	Flight path deviations .....	Time to activate deceleration devices.	Airplane weight.
Runway surface condition (dry, wet, icy, texture).	.....	Flight path angle .....	Approach speed.
Brake/tire condition .....	.....	Rate of descent at touchdown .....	Environmental conditions (for example, temperature, wind, pressure altitude).
Speed additives .....	.....	Approach/touchdown speed .....	Engine failure.
Crosswinds .....	.....	Height at threshold	
		Speed control.	

Although this is not intended to be an exhaustive list of variables to be considered, any program to reduce the current landing distance margins, for example, through the use of a Destination Airport Analysis, should address at least these items, and should be substantiated by actual operational landing data. No evidence exists to show that the current landing distance margin required by § 135.385 was established to compensate for deficiencies in predicting landing performance in the 1930’s and 1940’s that have since been rectified. One of the primary difficulties in establishing a safe landing distance margin, both now and at the time the landing distance limitations were originally developed, is that it depends on forecasting the landing conditions at the time of dispatch. The landing conditions must be forecast at the time of dispatch because the landing distance limitation is applied as a limitation on the allowable takeoff weight at the time of dispatch such that a safe landing can be made at either the destination or alternate airport. Safety margins are necessary to allow for differences between the conditions forecast at the time of dispatch and the conditions existing at the time of landing. In addition, since the actual landing distance achieved depends on pilot technique and environmental

conditions (for example, crosswinds, gusts), the safety margins must allow for variations in these parameters. Lastly, the procedures and techniques used in flight tests of transport category airplanes to determine AFM landing distances differ from those used operationally (notwithstanding the requirement in § 25.101(f) that states that “changes in the airplane’s configuration, speed, power, and thrust, must be made in accordance with procedures established \* \* \* for operation in service”). The flight tests to determine landing distances under § 25.125 are generally treated as demonstrations of the maximum performance (*i.e.*, minimum landing distance) that can possibly be obtained within the constraints of the certification requirements. Especially for large transport category airplanes, but also for many smaller transport category airplanes, the landing distance safety margins required by parts 121 and 135 are relied upon to provide realistic landing distances for use in the operating environment. FAA policy does not permit consideration of the effect of thrust reverse in calculating landing distances. Part 25 allows means other than wheel brakes to be taken into account if that means is safe and reliable, is used so that consistent results can be expected in service, and is such that exceptional

skill is not required to control the airplane. Nevertheless, the FAA has not found thrust reversers reliable enough to allow landing distances to be based on their use. This policy provides some additional safety margin for airplanes with reversers that are operable and used in combination with (not in lieu of) maximum braking from wheel brakes and spoilers. If the FAA were to allow the use of reverse thrust as a condition for using, for example, an 85 percent factor for calculating landing distances, the result would be to assign an arbitrary performance capability to reverse thrust, which may or may not be met by different airplane/engine/reverse thrust combinations. Also, it would be inconsistent with the treatment of reverse thrust by the FAA for airplane type certification purposes, which has not allowed landing distances to be based on the use of reverse thrust. In regard to the NPRM discussion of improved airplane certification guidelines, many of the guidelines referenced as improvements either date back to the era when the 60 percent rule was implemented or were put in place to limit the use of potentially hazardous flight test techniques to demonstrate short landing distances. For example, the limitations on approach angles and touchdown rates of descent were instituted in response to the steep approaches and hard landings used to