

obtain shorter landing distances. Although that type of flight test demonstration of maximum performance is no longer considered acceptable, the methods of determining the resulting landing distance parameters used to calculate the AFM landing distances still result in the same distances as had been obtained with that type of demonstration. Therefore, although the risk in flight testing has been reduced and any further deterioration in safety margin prevented, landing distances atypical of actual operations are still being achieved under part 25. This holds true

for all part 25 airplanes, independent of size or intended type of operation.

The claim that improvements in certification guidelines have reduced the need for the current part 135 (or part 121) safety margin is incorrect. The current certification guidelines for transport category airplanes were established assuming the use of the 60 percent rule, which ensures a margin of safety consistent with the number of variables and the degree of variation that might occur in actual operations. For example, in certification of one large transport category airplane, data showed that the safety margin would only allow for either a rate of sink at touchdown of

no less than 3 ft/sec, a glideslope of no less than 2 degrees, or a speed no more than about 10 percent higher than the designated approach speed. In this case, the 60 percent margin would be entirely used up for a rate of descent at touchdown of 4 ft/sec, a glideslope of 2.5 degrees, and an approach speed 5 knots higher than the no wind approach speed, all of which may be reasonably expected to occur in operational landings.

A table similar to that shown in the NPRM, but highlighting issues that may result in longer landing distances, illustrates the necessity of an adequate operational safety margin:

Certification criteria	Operational consideration	Effect on safety margin
3.5 degree glideslope angle	2.5 to 3 degrees typical	Actual landing distance will be longer than calculated landing distance.
8 ft/sec touchdown rate of descent	2 to 4 ft/sec typical	Actual landing distance will be longer than calculated landing distance.
Assumes all approach speed additives bled off before reaching the 50 foot height.	5 to 10 knots exceedances not uncommon	Actual landing distance will be longer than calculated landing distance.
	Longer flare distance ("float")	Actual landing distance will be longer than calculated landing distance.
	Less than full braking effort	Actual landing distance will be longer than calculated landing distance.
	Delays in obtaining full braking configuration ..	Actual landing distance will be longer than calculated landing distance.
	Higher temperatures not accounted for (temperature accountability not required).	Actual landing distance will be longer than calculated landing distance.
	Downhill runway slope not accounted for (runway slope accountability not required).	Actual landing distance will be longer than calculated distance.
	Icy, slippery, or contaminated runway surface	Actual landing distance will be longer than calculated distance.
	Airplane heavier at time of landing than predicted at time of dispatch.	Actual landing distance will be longer than calculated distance.
	Airplane higher than 50 feet over the threshold.	Actual landing distance will be longer than calculated distance.
	Airport pressure altitude higher than predicted at time of dispatch.	Actual landing distance will be longer than calculated distance.

The NPRM preamble states that if the 60 percent requirement were necessary for part 91 operations, business jets operated under part 91 should have a higher rate of runway overshoot events than on-demand operators have under part 135. The preamble states that such a difference has not been observed, and that landing accident rates under part 91 and part 135 have been nearly identical during the previous 12-years. The preamble cites a report prepared by Robert E. Breiling Associates of Boca Raton, Florida. The report concludes, "it would appear that the 40 percent safety factor in present use for FAR 135 is excessive. A factor based on actual aircraft performance on contaminated runways with the inclusion of a 10 percent to 20 percent safety factor would be more appropriate." However, a closer look at the Breiling report reveals that 73.8 percent of all business jet accidents/incidents occurring in the

landing phase involved part 91 operations, while 26.2 percent involved part 135 operations. Accident/incident rates cannot be inferred directly from this information, however, as the number of operations conducted under these respective operating rules is not known. Additional problems in trying to draw conclusions from generalized accident statistics like these are that: (1) Many part 91 operators apply part 135 landing distance margins even though they are not required to do so by regulation, and (2) most operations are conducted on runways that are longer than the minimum length necessary to comply with the landing distance limitations.

In 1985, there was a fatal landing overrun of a Lear 24, operating under part 91, at Catalina Airport on Santa Catalina Island, Avalon, California. The runway length at Catalina Airport is 3,240 feet long. Without any safety

margin, the Lear 24 needs a landing distance of 3,100 feet at the conditions present in the accident. If the 60 percent rule were applied, a landing distance of 5,167 feet would have been required.

As a result of the accident, the NTSB recommended that the FAA issue an operations bulletin directing general aviation safety inspectors and accident prevention specialists to urge operators of transport category airplanes to use safety margins consistent with those required by part 135, or at least a margin consistent with the performance of the emergency brake system on the airplane. The FAA responded to the Board's safety recommendation by issuing Operations Bulletin 86-2, which described the above accident and directed general aviation safety inspectors and accident prevention specialists to take actions in accordance with the Board's recommendation. (This information appears in the current issue