

STAR 004
V2 – December 14

Cross Wind Landing Limits

One of the most common categories of incidents and accidents continues to be unexpected loss of directional control while landing; in many cases strong crosswinds have been a contributory factor. Furthermore, confusion over interpretation of JAR/FAR 25 certification crosswind component against operational crosswind limits has also been identified as a contributory factor. Many of these events could be avoided by better decision-making, both in the planning phase as well as in-flight.

Coping with strong crosswind landings warrants the imposition of adequate safety margins for both the aircraft and the flight crew. Therefore it is important that an airline has a logical and practical policy concerning landings in strong crosswind, and this should include limitations under a variety of conditions. This STAR provides a guideline for operators in setting company crosswind landing limits.

PUBLISHED AIRCRAFT CROSSWIND LIMITS

The Aircraft Flight Manual (AFM) will contain a figure qualified as a “Maximum Demonstrated Crosswind” this is not necessarily a “limit”. This figure will appear in the “operational limitations” section only if it is actually considered limiting for either take-off or landing, or for some other reason, such as autoland operation: in the latter case a descriptive clause will accompany the figure.

SETTING CROSSWIND LANDING LIMITS

Manufacturer:

The company crosswind landing limit policy must first of all be based on any published manufacturer’s limitations and perhaps any manufacturer’s recommended guidelines.

→ If the maximum crosswind quoted is “as demonstrated” by a test pilot it may be necessary to factor for the average fleet pilot.

Variable Factors:

The following areas are worth considering when devising your own crosswind landing limits; each condition will require the setting of a crosswind landing limit less, and never more, than the maximum decided upon (or mandated) above.

Runway condition:

- for dry and damp runways - local knowledge of the general greasiness
- for wet runways (< 3mm) – check ATIS for “slippery when wet”
- type and degree of contamination (water, snow, slush and ice)
- reported runway friction coefficient or braking action
- runway width (include consideration for width available following snow clearance)

NB: this information is easily presented in tabular format, as the FSF has done in the ALAR Toolkit.

Pilot experience:

- total hours or hours on type – easy to write a rule
- previous experience of crosswind landings – who decides?
- time since last crosswind landing (flight or simulator)
- combined experience of both pilots



NB: some companies have different limits for Captains and First Officers, but this does not necessarily equate to current competency levels.

Technique being used:

- side slip only – airframe geometry imposes a low maximum limit (perhaps only 15 knots)
- crab only – tyre and undercarriage strengths impose maximum crab angle (at 30 knots this could be as much as 15°)
- aircraft weight and hence approach speed may affect rudder authority and controllability on a contaminated surface

NB: consult with the manufacturer regarding these limits and any recommended technique.

Environment:

- magnitude and frequency of gusts
- magnitude and frequency of changes in wind direction
- specific local influences such as turbulence caused by terrain, buildings, thermals etc
- visibility (ie CAT II operations) – consider autopilot disconnect height

Equipment failures:

- engine, reverse thrust, main brakes, anti-skid, spoilers/airbrakes, nosewheel steering etc

NB: failure of any of the above would generally require the use of a reduced crosswind limit; in some cases (refer to AOM) it will be necessary to change destination.

Personal:

- fatigue levels
- physical condition
- gut feeling

NB: both an objective and subjective crew and self-examination.

Implementation:

The best way to prepare pilots for the risks associated with strong crosswinds on landing is through education, training and practice.

- **A crosswind landing limits policy is a safety net and should be well-understood and adhered to by all flight crew. Having a no-penalty go-around policy will ensure that limits are observed and that risks are minimised.**
- **Whatever your crosswind landing limit – remember there is always the option to GO AROUND!**
- **Operating near maximum values of crosswind on contaminated runways is extremely unwise; which is why an airline should have a crosswind limit policy.**

RECOMMEND PRACTICES

- Before any approach and landing brief is undertaken, the presence of a crosswind must first be acknowledged.
- Use company guidelines, SOPs and/or AOM to establish the maximum crosswind limit (STAR 004 XWLL).
- Be honest; ask yourself (or each other) what level of skill do you have. This will most likely depend on how recently, and how often, you have flown crosswind approaches and also used the technique being opted for.
- The answer to this question may mean that you impose your own lower crosswind limit, or decide not to make an approach.
- Having established a crosswind landing limit is not a green-light to go ahead with the approach



other matters may need consideration

- Brief the approach, flare, roll out and deceleration techniques and contingencies
- Fly a stabilised approach
- Spot the landing area and stick to it – resist the temptation to “grease-on” the landing
- Continue to fly the aircraft after touchdown – avoid wing lift
- Avoid directional control problems after touchdown by effective use of reverse thrust, rudder and brakes
- **Always keep the option of a Go Around**
- If it's available request a different runway with more favourable conditions – ie avoid short-cuts
- Consider waiting for improved conditions, or
- If necessary DIVERT.

CAUTION: Pilots should avoid development of their own landing techniques – consult with your training department on the matter.

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