



# Safe operations of Brussels Airport runways

## Technical paper

### BeCA continues to strive for an optimal level of safety at Brussels airport

With this technical paper BeCA wants to resume the most urgent issues of our previous publications. We do hope our recommendations which are entirely in line with the international regulations and IFALPA findings will be applied in the near future in order to improve the overall safety level of Brussels airport.

### Birds never land with tailwind. Why should pilots?

According to the ICAO regulations aircraft should always take off and land into the wind. As an exception to this general rule a maximum of 5 kts of tailwind and 15 kts of crosswind (gusts included) may become the operating limits in a preferential runway system. Today Brussels airport exceeds this ICAO exceptional rule by applying a maximum of 7kts tailwind and 20kts of crosswind.

Due to the use of these 'stretched' wind criteria in Brussels, pilots often experience difficulties in stabilizing their aircraft on final approach on runways 25L and 25R in case of easterly winds. Excessive tailwind on approach results in steep descents and difficulties to reduce to the landing speed.

For take off as well tailwind is deteriorating safety. First of all more power is needed to compensate for performance loss during the take off roll on the runway. Secondly, once airborne, the wind picks up in strength. During this transition the aircraft needs to find its new aerodynamic balance and while doing so, it loses another bit of climb performance. Finally a greater tailwind component decreases the aircraft's climb angle. This results in a triple disadvantage for take off performance when operating with significant tailwind.

Pilots should not be fighting basic aerodynamic laws when they take off and land their aircraft.

Besides compromised safety more noisy operations are a result of these stretched tailwind operations at Brussels. Aircraft climb less steeply with more power and the noise is being blown forward and away from the airport where as during headwind operations aircraft noise is blown back to the airport area.

## June 27 BeCA recommendations

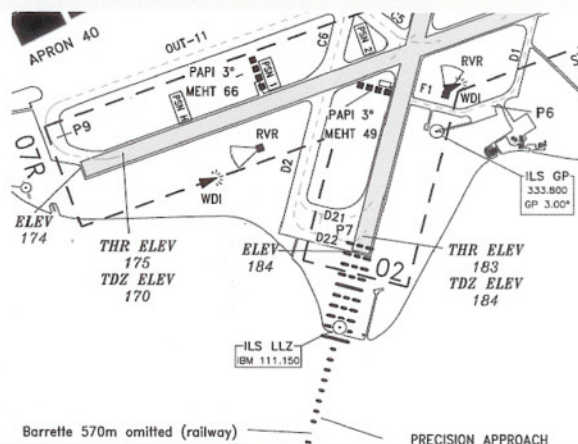
### Safe Runway use

To increase the level of safety at Brussels airport, operation on crossing runways needs to be avoided at all times.

At times of a westerly winds, the best option is the parallel use of runways 25L and R. In order to obtain the equivalent use of both runways for take off, the existing plans for the taxiway to the threshold of 25L need to be executed.

At times of easterly winds, the best option is the parallel use of runways 07L and R. As climate changes seem to bring more often strong easterly circulation, exceeding the cross wind limitations for runway 02, runways 07 L and R have already been used more frequently lately. However the existing approach procedures on these runways don't come up to the mark. An ILS on RWY 07L is essential in a first stage to increase the level of safety.

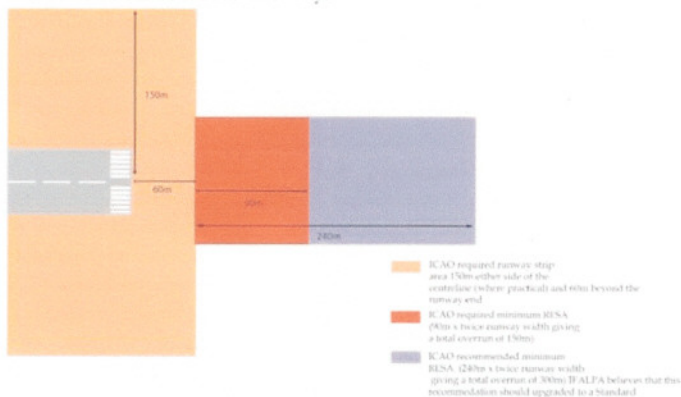
Runway 02/20 can be used both ways depending the wind direction during off-peak periods in single runway operation.



an area that extends a minimum of 90m beyond the end of the runway strip and with twice the width of the runway. Analysis of data from runway overrun events has shown that in most cases aircraft leave the runway surface at speeds less than 70kts and come to a complete stop within 300 m of the runway end.

ICAO recommends a minimum RESA of 240m. Added to the 60m runway strip this provides 300m overrun available. In case an adequate RESA cannot be constructed due to the location of the runway and the surrounding terrain, an Engineered Materials Arresting System, EMAS should be installed. An EMAS is an arrestor bed of crushable concrete blocks which transfers the energy from

RESA Dimensions Code 3 and 4 Runways



### Extended RESA or EMSA

At the end of each runway a runway strip needs to exist. This is an area flat, firm and free of non-frangible obstructions and it must extend a minimum of 150m either side of the runway centreline and at least 60m beyond the end of the runway.

The RESA, Runway End Safety Area is

an overrunning aircraft into the action of crushing the concrete system.

#### Abbreviations

- BeCA Belgian Cockpit Association
- ICAO International Civil Aviation Organisation
- IFALPA International Federation of Airline Pilots Associations
- Kts knots
- ILS Instrument Landing System
- RESA Runway End Safety Area
- EMAS Engineered Materials Arresting System