BA Safety Plan

Runway Excursion

Runway excursions are the most frequent accident category for worldwide accidents and the third most frequent accident category for aircraft registered in EASA States (EU27+4). In terms of fatal accidents, runway excursions rank in sixth place both worldwide and for aircraft registered in EU27+4 States.

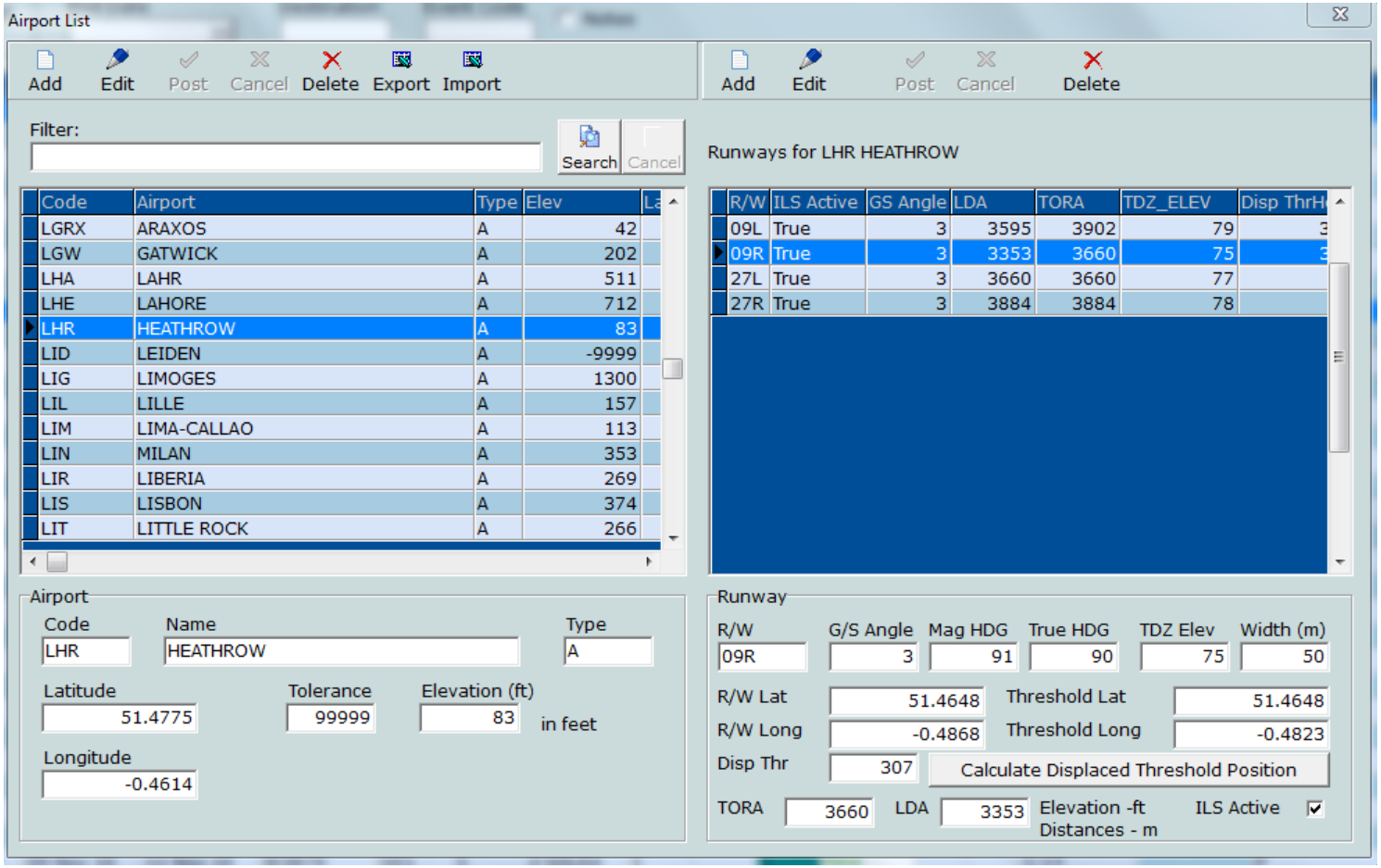
Runway Excursion (Approach / Landing)

Existing FDM capability at BA (as at 2015)

- Approach - speed, energy, config, profile
- Touchdown – tailwind, flare time, pitch attitude, deep/short/heavy landing
- Rollout – Thrust Reversers

New FDM functionality

- Airport table



New FDM functionality

- Airport table functions introduced

Function Name	Description
RWHDGM(Pos)	Returns the runway magnetic heading in °
RWHDGT(Pos)	Returns the runway true heading in °
RWBLAT(Pos)	Returns the beginning runway latitude
RWBLONG(Pos)	Returns the beginning runway longitude
RWTLAT(Pos)	Returns the runway threshold latitude position
RWTLONG(Pos)	Returns the runway threshold longitude position
RWLDA(Pos)	Returns the runway LDA (Landing distance available) in m
DISTBRW(Pos,Lat1,Long1)	Returns the distance from (Lat1,Long1) to the respective begining of the runway
DISTTHRLD(Lat1,Long1)	Returns distance to landing threshold using haversine formula in feet
DISTTHRM(Pos,Lat1,Long1)	Returns the distance from (Lat1,Long1) to the respective runway threshold using the Haversine formula, result in m
DISTTHRTO(Lat1,Long1)	Returns distance to takeoff threshold using haversine formula in feet

Exploitation

- Touchdown – Deep & Short Landings revised methodology
- Rollout – introduce stop end events ?

Runway Excursion

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Overrun on Take Off

A departing aircraft fails to become airborne or successfully reject the take off before reaching the end of the runway.

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Overrun on Landing

A landing aircraft is unable to stop before the end of the runway is reached.

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Veer Off

An aircraft departs the side of the runway after touchdown on landing or departs the side of the runway during the take off run.

EASA precursors!

https://www.easa.europa.eu/sites/default/files/dfu/214908_EOFDM_WGA_Runway_Excursions-R1.pdf

EASA precursors!

Accident scenario #5: Runway overrun after landing

Table 5: Precursor factors for accident scenario #5

Increasing "proximity" to the accident →			
Poor visibility			
Tailwind	High energy over threshold	Deep landing	Inadequate use of stopping devices
Crosswind	Long flare	Abnormal runway contact	Slow deceleration
Unstable Approach	Excessive engine power during landing	Excessive energy at touchdown	
Incorrect performance calculation Inapropriate aircraft configuration			

Slow Deceleration

Research

- Speed (GSPD) or deceleration (longitudinal accel) ?
- 80 kts at 800m 40 kts at 400m

Testing, testing

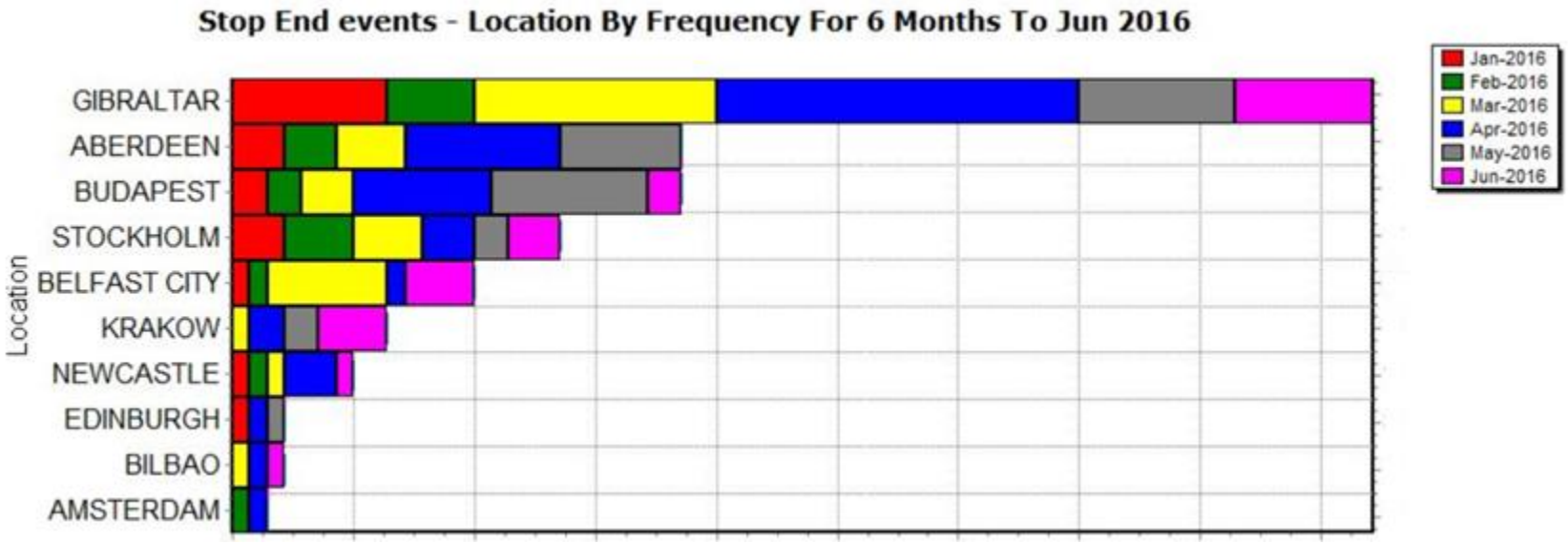
Jan 16 go-live

- High Speed at Stop End

  45 kts g/spd with 300m of rwy remaining

- High Deceleration at Stop End

  -0.20g with 300m of rwy remaining



Early results – common themes

- Often short runways
- No autobrake or autobrake “kicked out” early
- A period of little or no braking
- Braking in excess of what would be achieved by LO or even MED autobrake in the final 100m of runway

Crew Communication

- Safety newsletters
- Gatekeeper (Union) calls for outlier events and crew commonality

Jan 17 event trigger revisions

- High Speed at Stop End

  45 kts g/spd with 250m of rwy remaining

- High Deceleration at Stop End

  -0.25g with 250m of rwy remaining

OM ‘A’ Stable Approach Policy (from 2011)

- A snip from OM ‘A’ from 2011:

Stabilised Approach

On all approaches the aircraft must be flown to be stable by 1,000 ft RA.

If the stable approach criteria have not be achieved by 1,000 ft RA then a go-around must be flown.

An approach is considered stabilised when all of the following criteria are met:

In the planned landing configuration (gear down, land flap set)

Stabilised on the correct vertical profile (glidepath or final approach path)

Stabilised at the target approach speed (taking into account the prevailing conditions – see notes 1 and 2)

OM ‘A’ Safe Landing Policy (from 2017)

Summary

To further manage the risk of **runway excursion** (RE) on landing the Safe Landing Policy is introduced comprising **four** critical safety controls as follows:

1. **“Calculate the inflight landing distance and stop margin”** - Avoid an unsafe landing attempt
2. **“Fly a stable approach”** - Present the aircraft in a safe position to land
3. **“Fly a safe touchdown”** – Flare then touchdown in a safe position to rollout
4. **“Perform a safe rollout”** – Maintain deceleration to assure a stop on the paved surface

Safe Touchdown Criteria

Safe Touchdown Criteria
On all approaches the aircraft must be flown to achieve a safe touchdown.

If the safe touchdown criteria have not been achieved, then a rejected landing maneuver must be flown.

A rejected landing can be conducted at any time until reverse thrust is selected.

A touchdown is considered safe when all of the following criteria are met:

- Main Gear Touchdown within the Touchdown Zone
- Main Gear Touchdown and trajectory within runway edge is guaranteed.
- Normal Runway contact within the aircraft geometric landing limits.

Safe Rollout Criteria

Safe Rollout Criteria
On all rollouts the aircraft must be decelerated in such a manner to assure a safe stop prior to the runway end and to routinely achieve taxi speed by at least 300 m from the runway end.

If at any stage following initial selection of reverse thrust, stopping is not assured, maximum braking and the maximum reverse as permitted by fleet specific guidance shall be used.

A safe rollout is achieved by:

- Timely use of all deceleration devices that were included in the Inflight Landing Performance Assessment.
- Maintaining deceleration (see *Note*) until stop is assured and an appropriate runway exit speed is reached.

Note: Cancelling Autobrake systems early in the rollout and coasting at high speed can increase the threat of runway overrun and lateral excursion, even after a safe touchdown. Braking action at the stop-end of the runway is not guaranteed to be consistent with that achieved during the initial rollout.

FDM Stop End events - trend