



# Characterization of Deep and Long Landings and of the Runway Excursion Risk

**Capt. Michael WENDT**

**Pere FABREGAS**

A STAR ALLIANCE MEMBER 



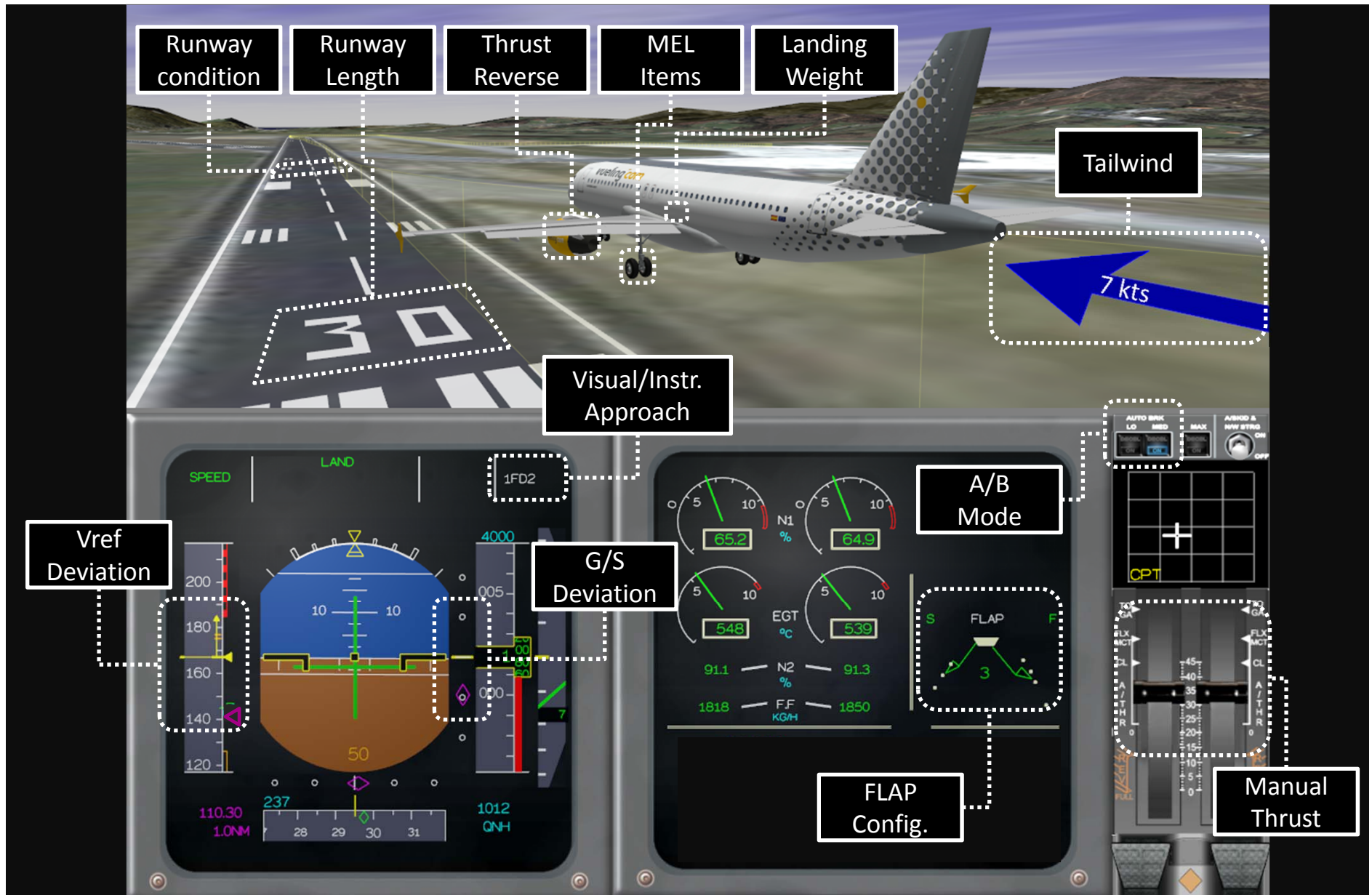
**Lufthansa**

**vueling**

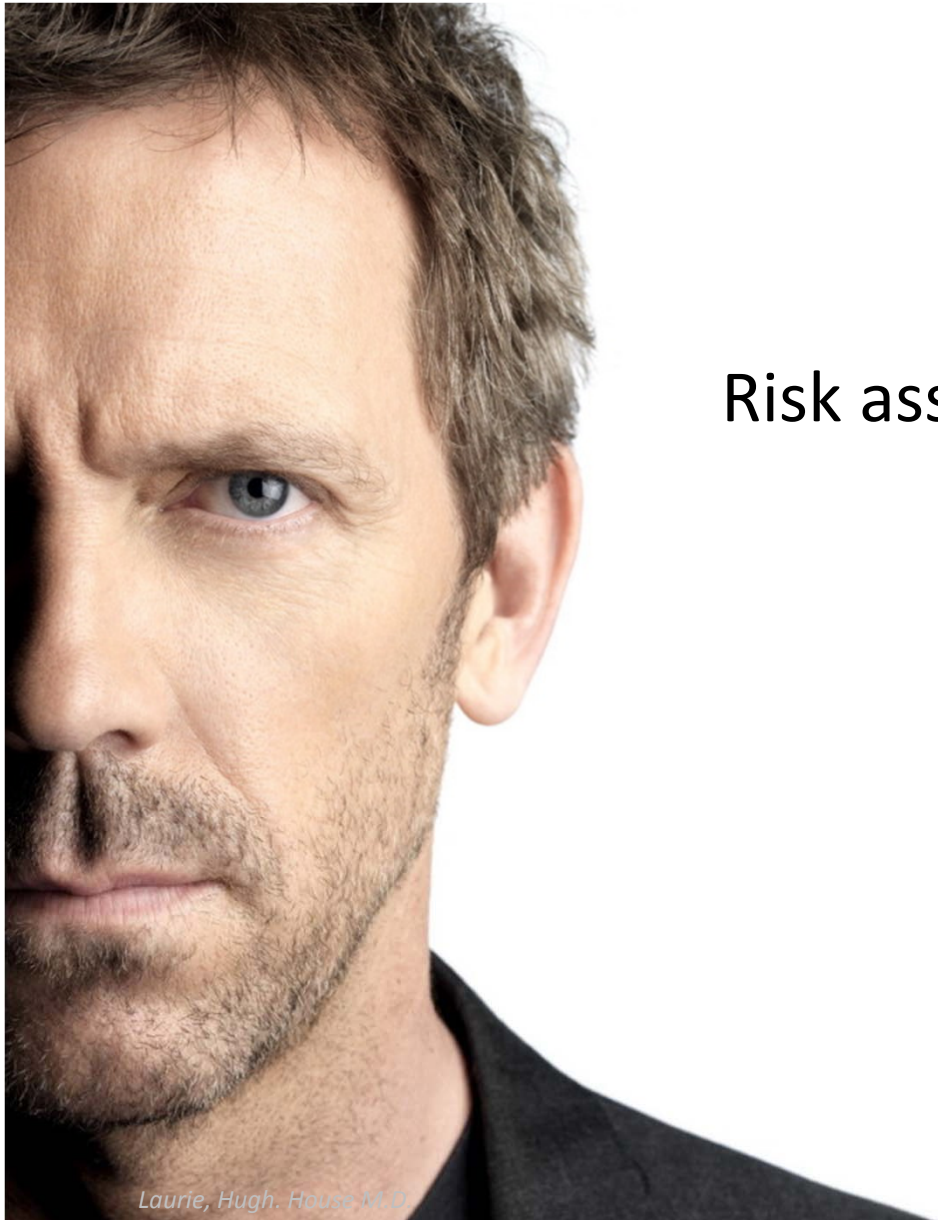
**Moderated by Capt. Bertrand de Courville**

# How far are we from an accident?









Laurie, Hugh. House M.D.

Risk assessment should be based  
on the  
**ILLNESS**  
rather than the  
**SYMPTOMS**

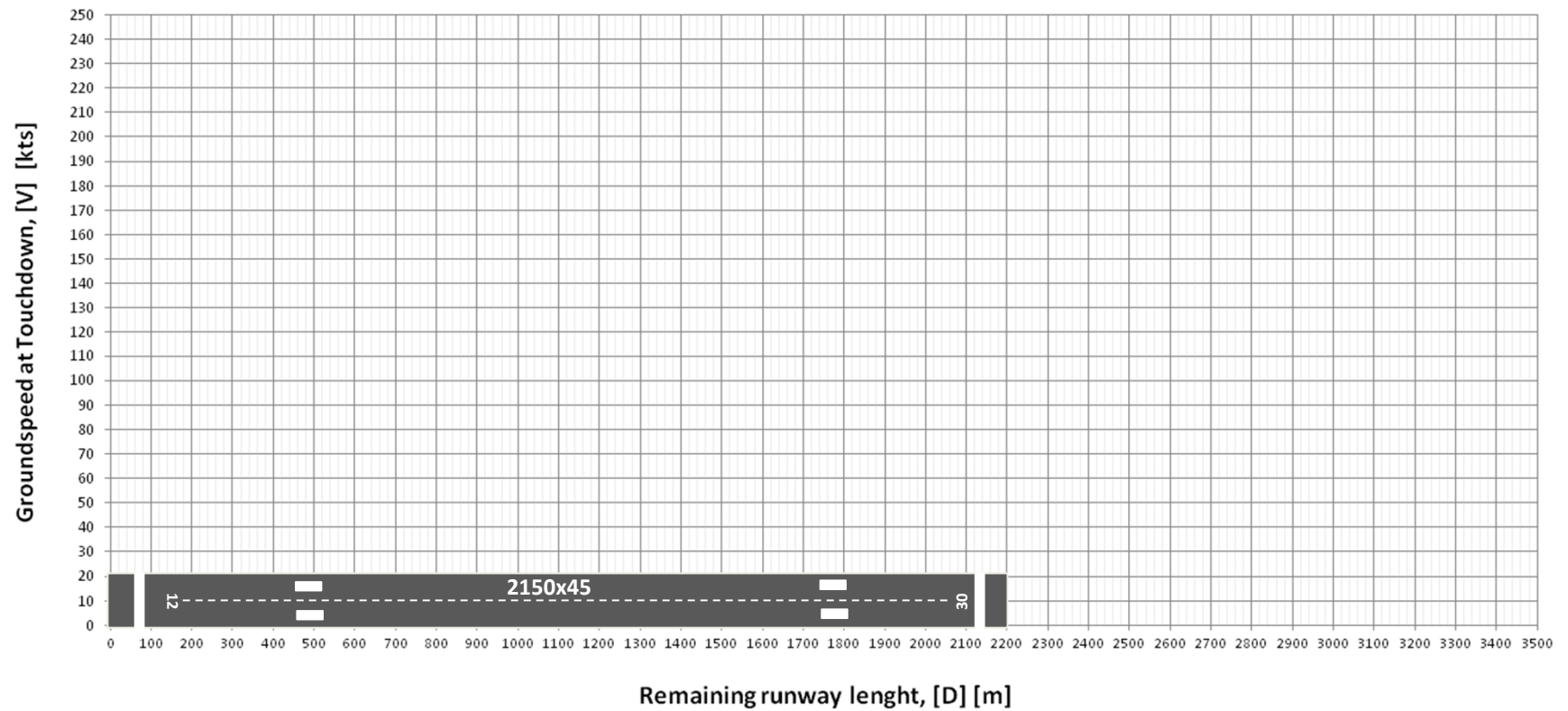


# Runway Excursion Risk Assessment Diagram



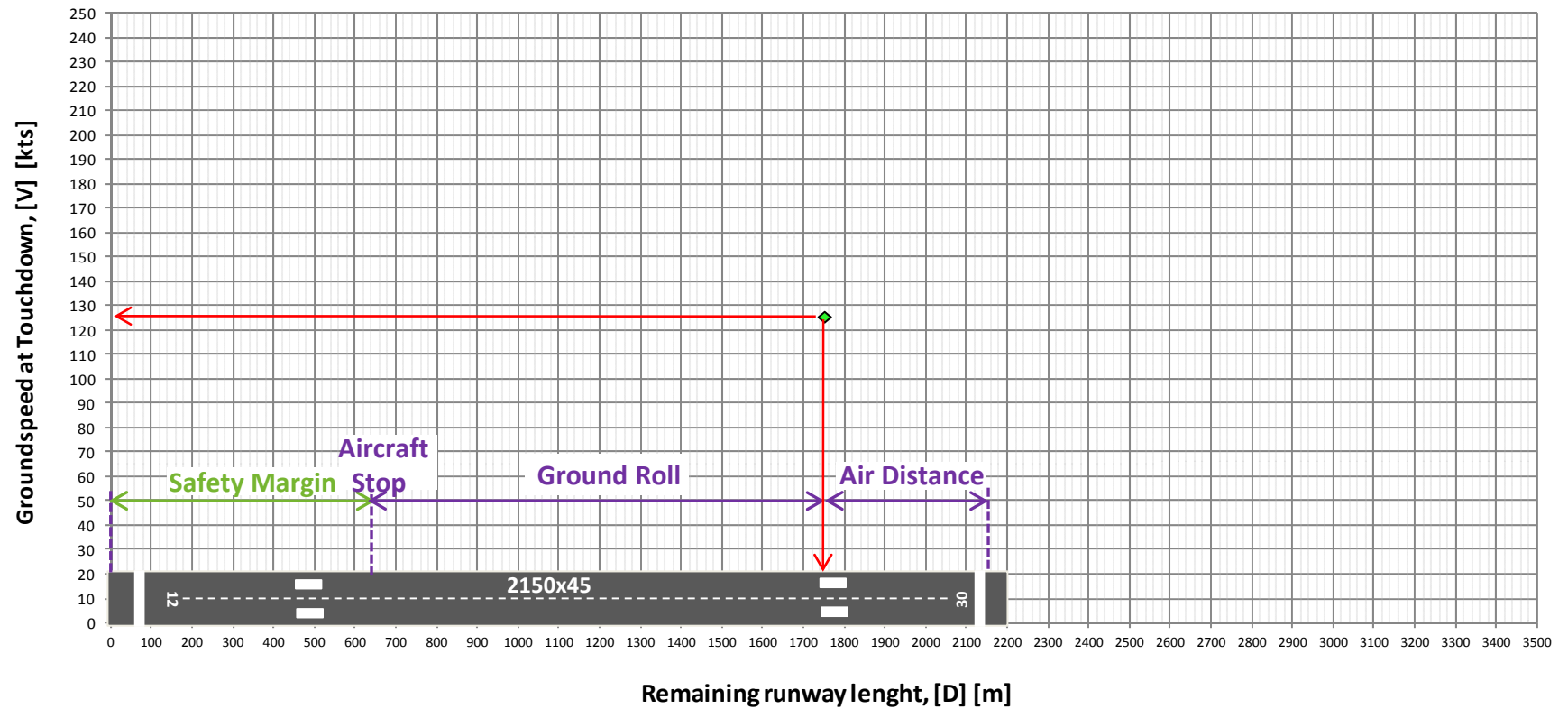
## Runway Excursion Risk Assessment Diagram

Building the diagram...



## Runway Excursion Risk Assessment Diagram

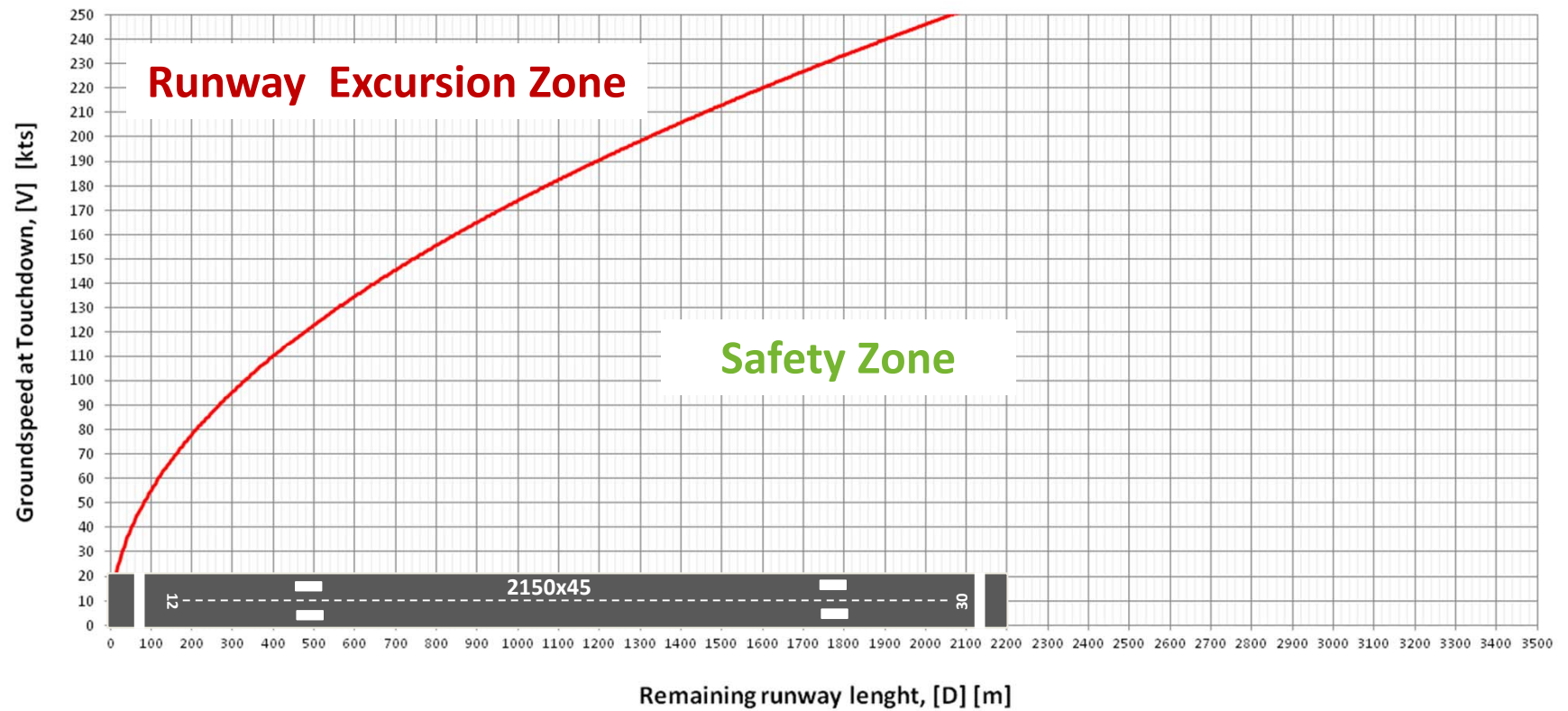
### The Touchdown point





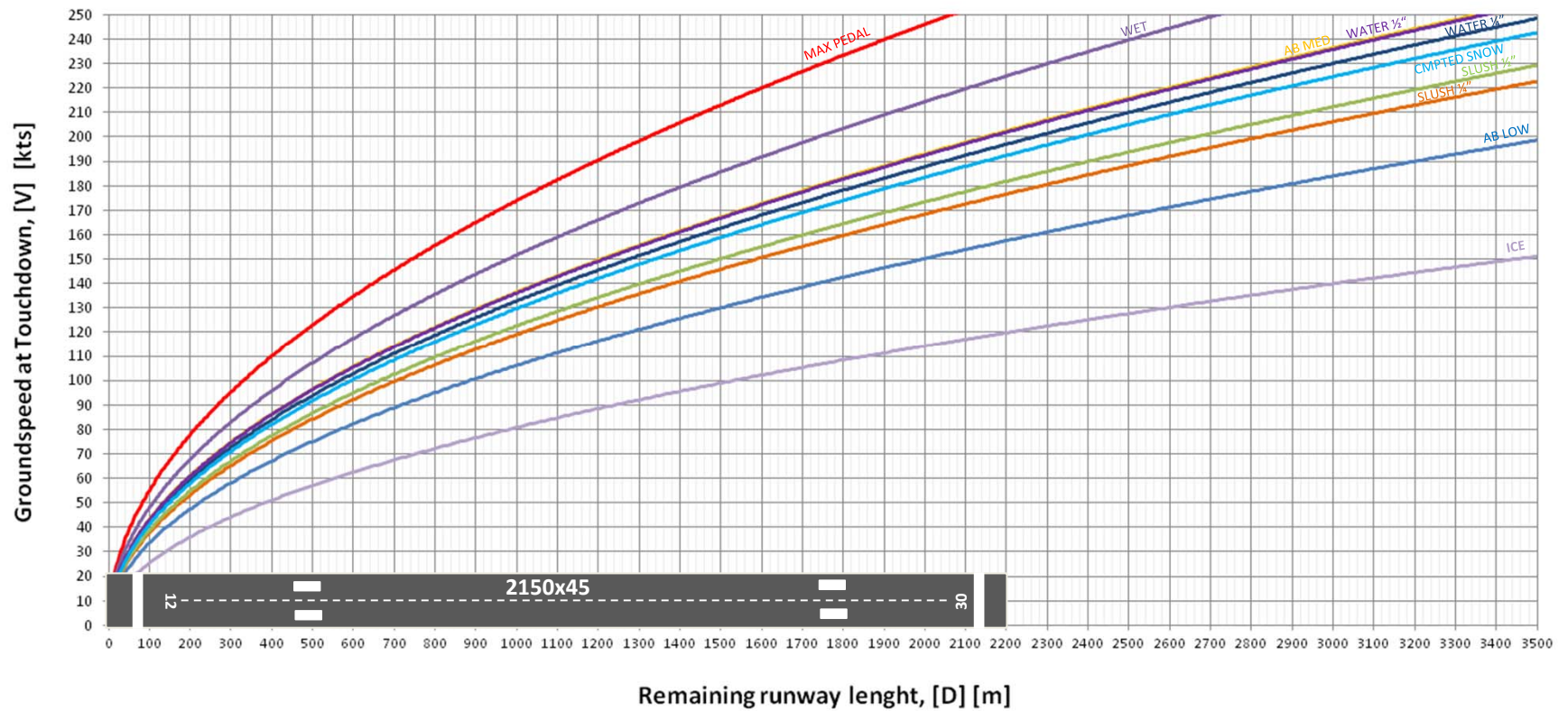
## Runway Excursion Risk Assessment Diagram

Where is the limit?



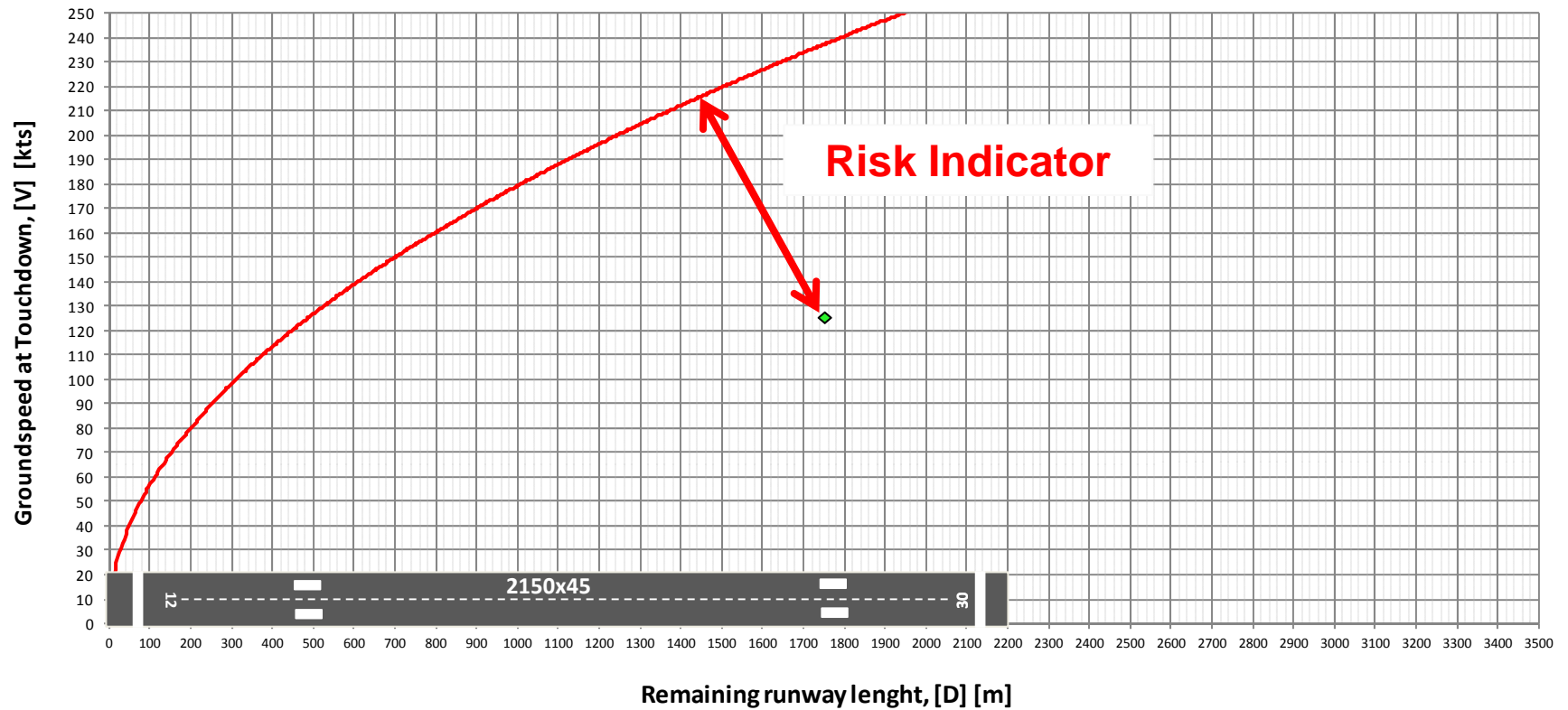
## Runway Excursion Risk Assessment Diagram

### Non-optimal braking conditions



## Runway Excursion Risk Assessment Diagram

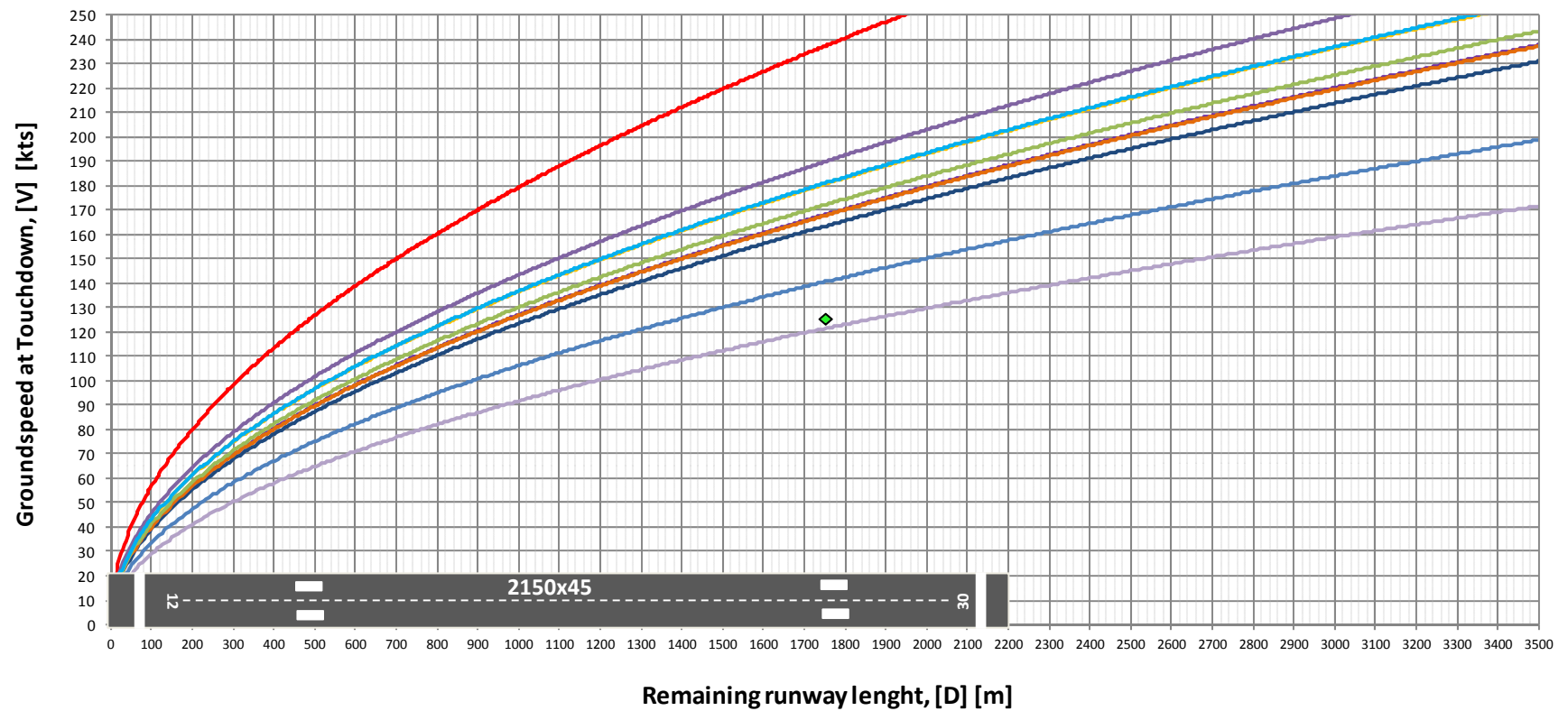
How far from the Limit?



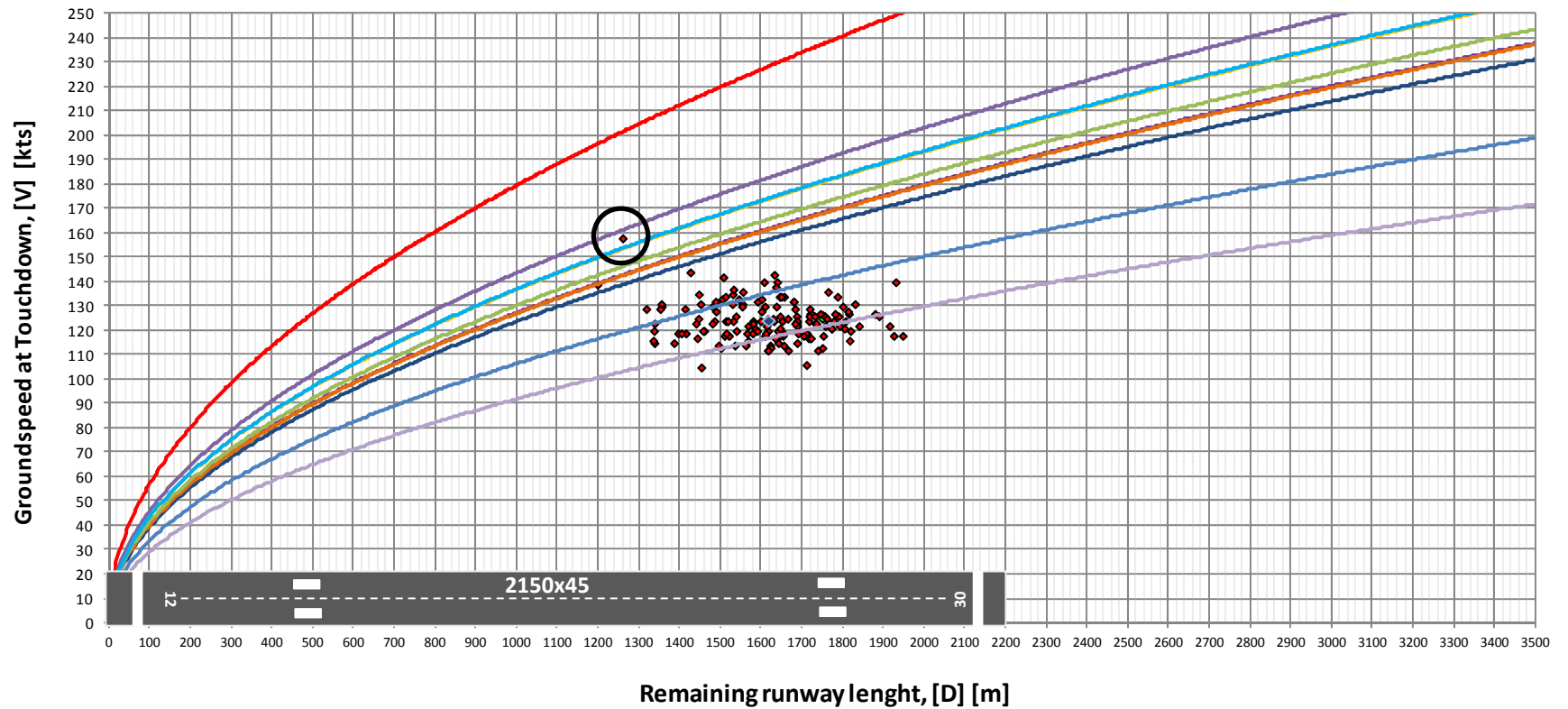


## Runway Excursion Risk Assessment Diagram

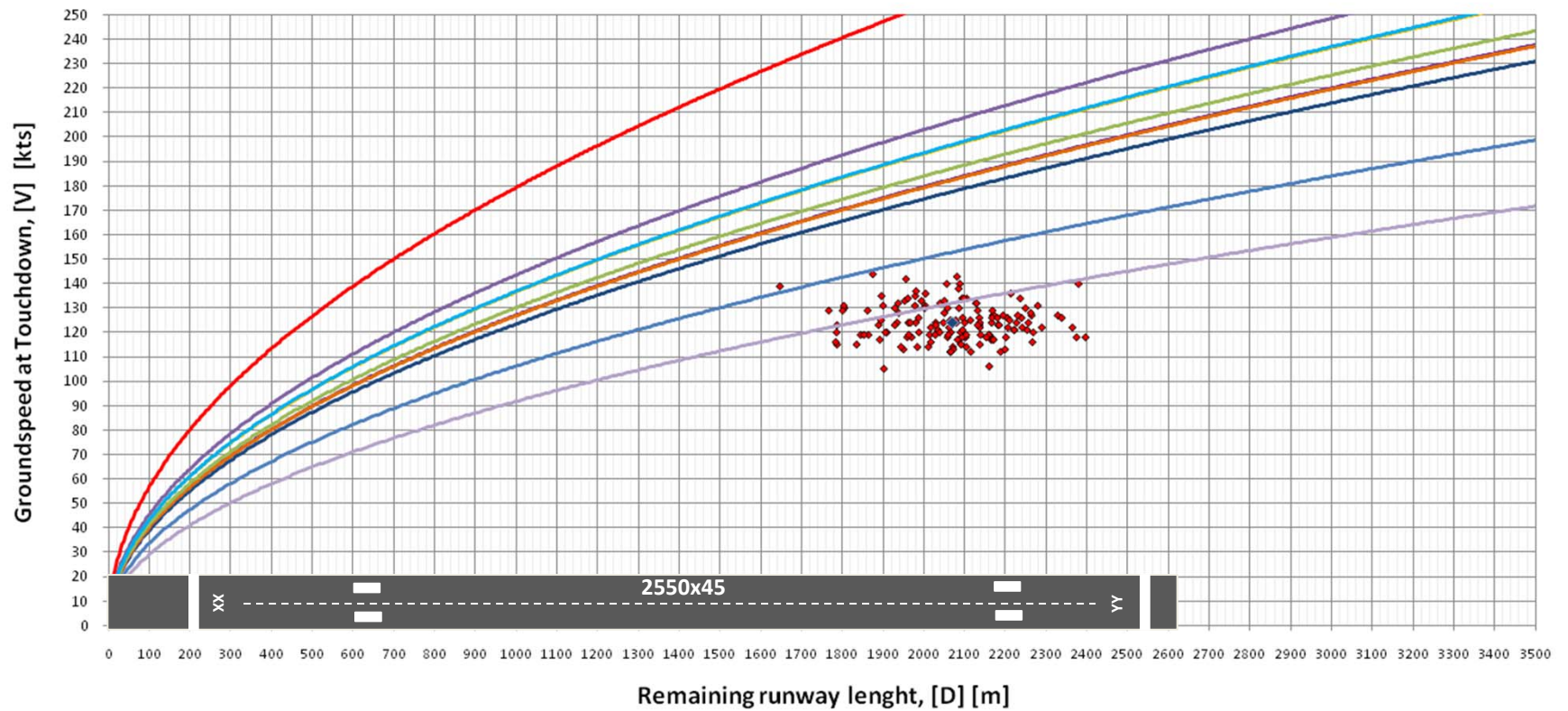
### Real application



## Runway Excursion Risk Assessment Diagram



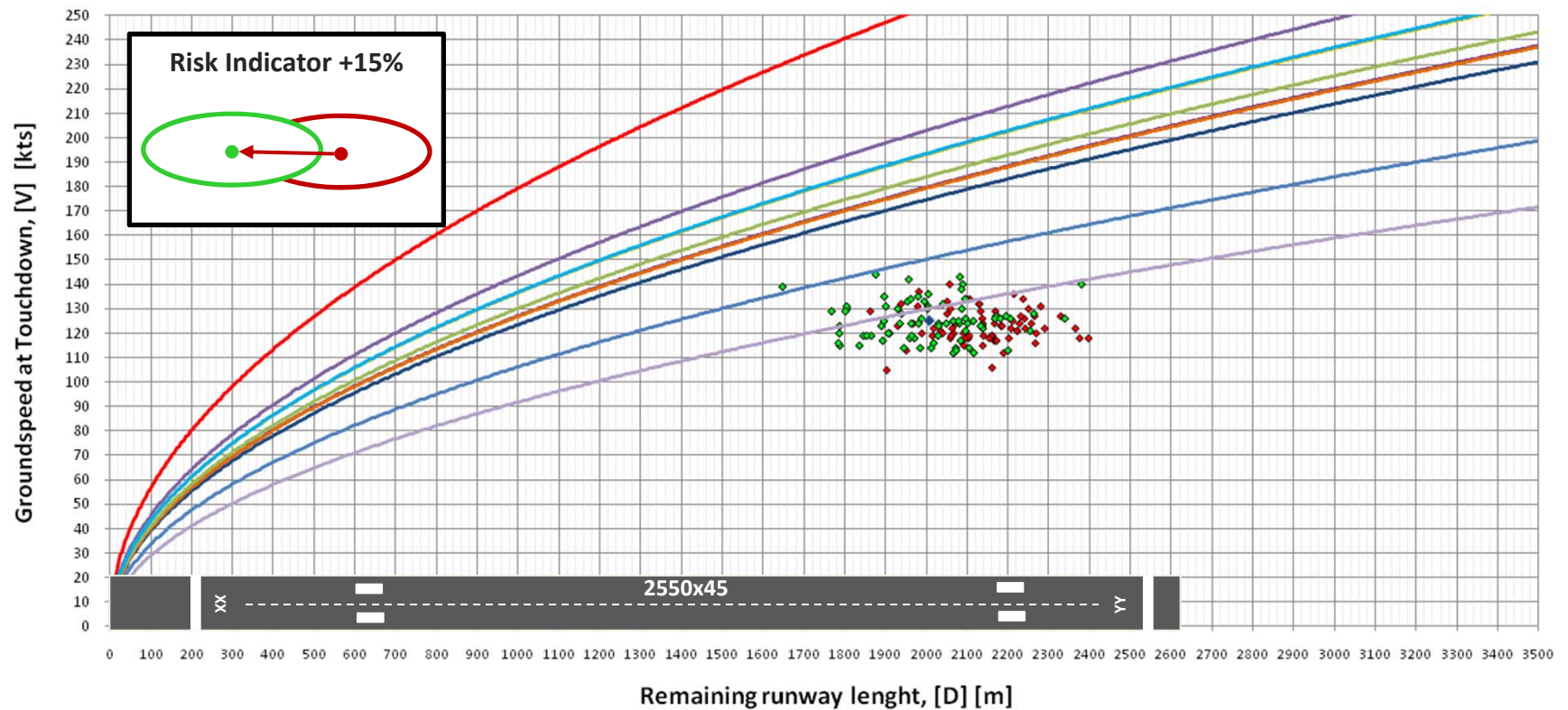
## Runway Excursion Risk Assessment Diagram





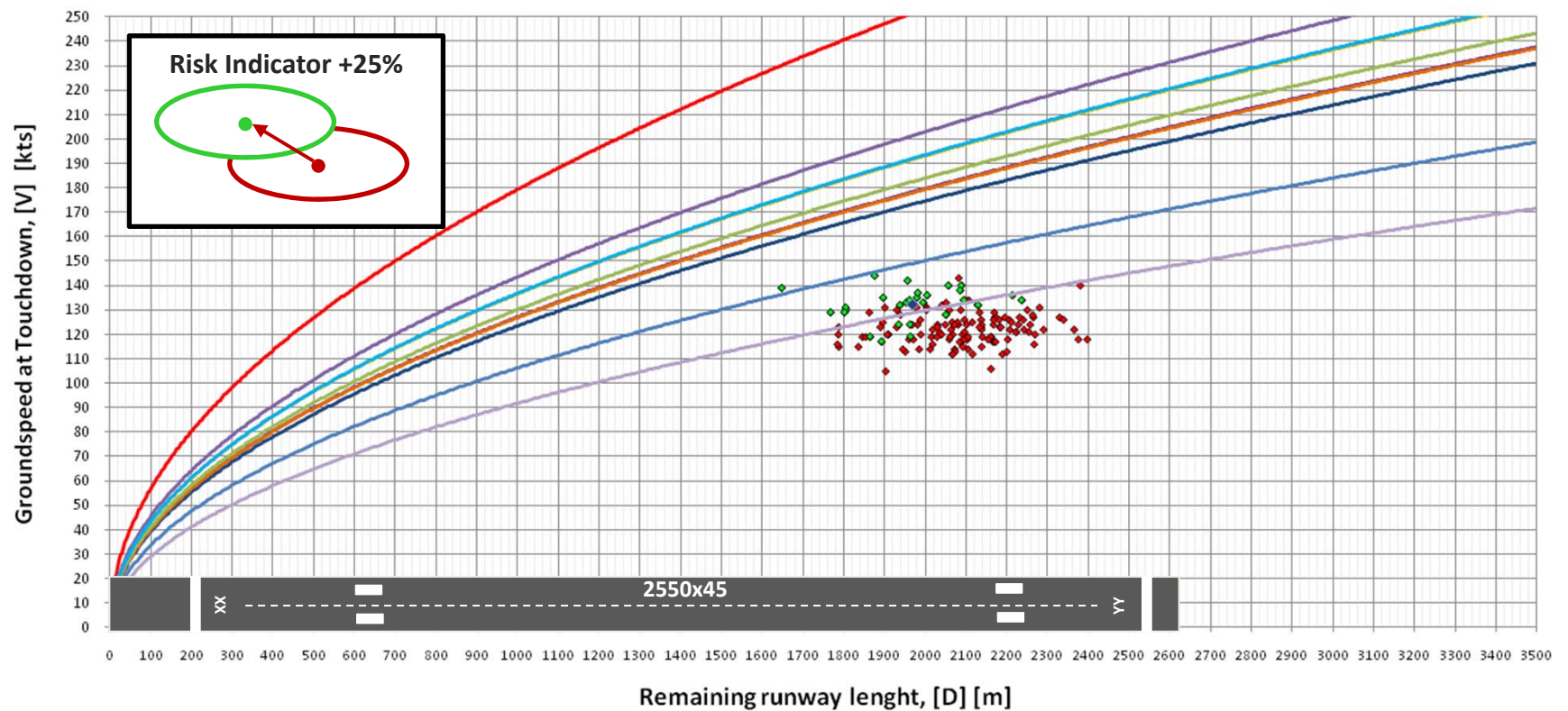
## Runway Excursion Risk Assessment Diagram

>1 DOT ABOVE THE GLIDE SLOPE



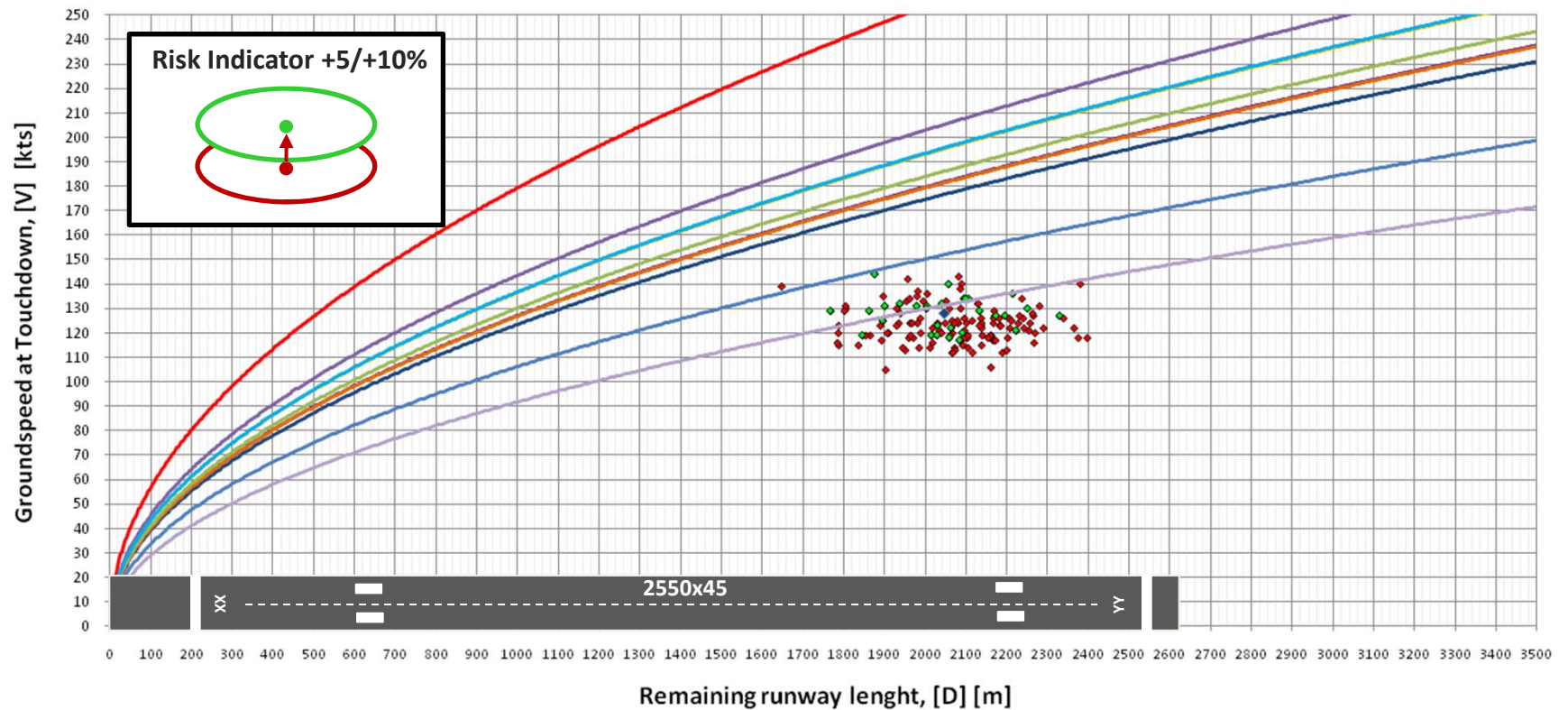
# Runway Excursion Risk Assessment Diagram

ANY TAILWIND COMPONENT



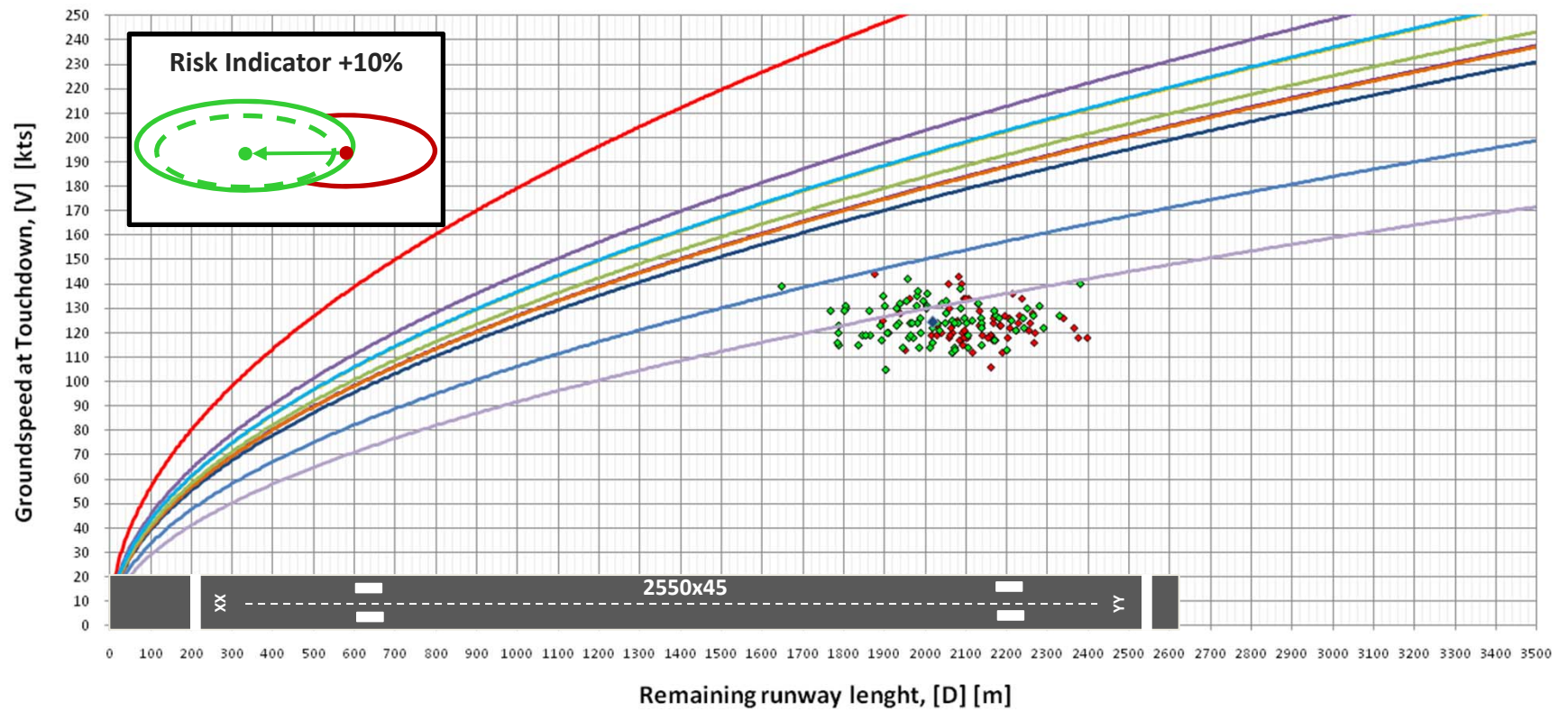
## Runway Excursion Risk Assessment Diagram

### HEAVY LANDING WEIGHT or Vref DEVIATION



# Runway Excursion Risk Assessment Diagram

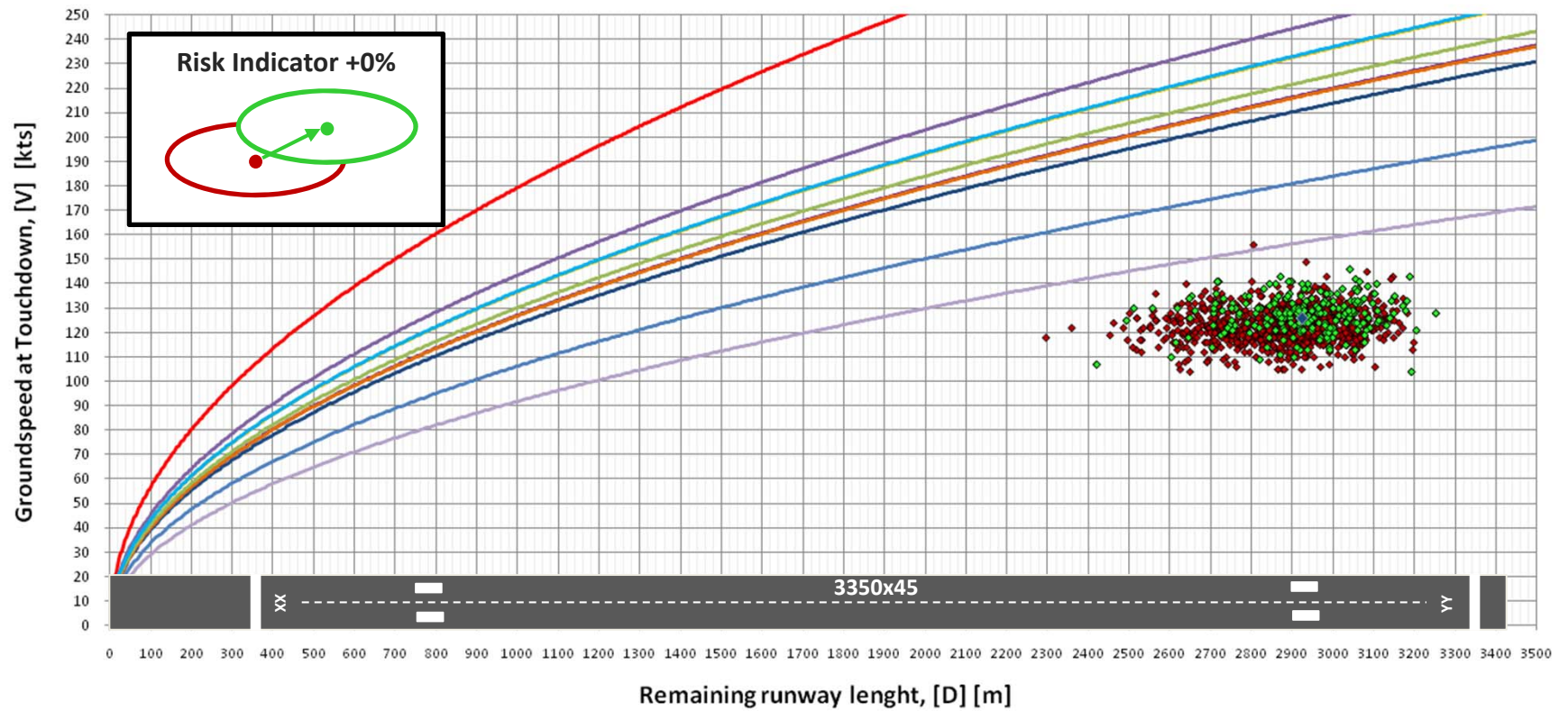
## VISUAL APPROACH





# Runway Excursion Risk Assessment Diagram

## FLAP 3 AT LANDING





### Why is it effective?

- Subjectivity reduced
- Global solution
- Hotspots quickly detected
- Risk factors assessed
- Accurate mitigation actions defined



## **Landing Technique – *FODA Analysis***

*Flight Safety Department Lufthansa*

January 2012

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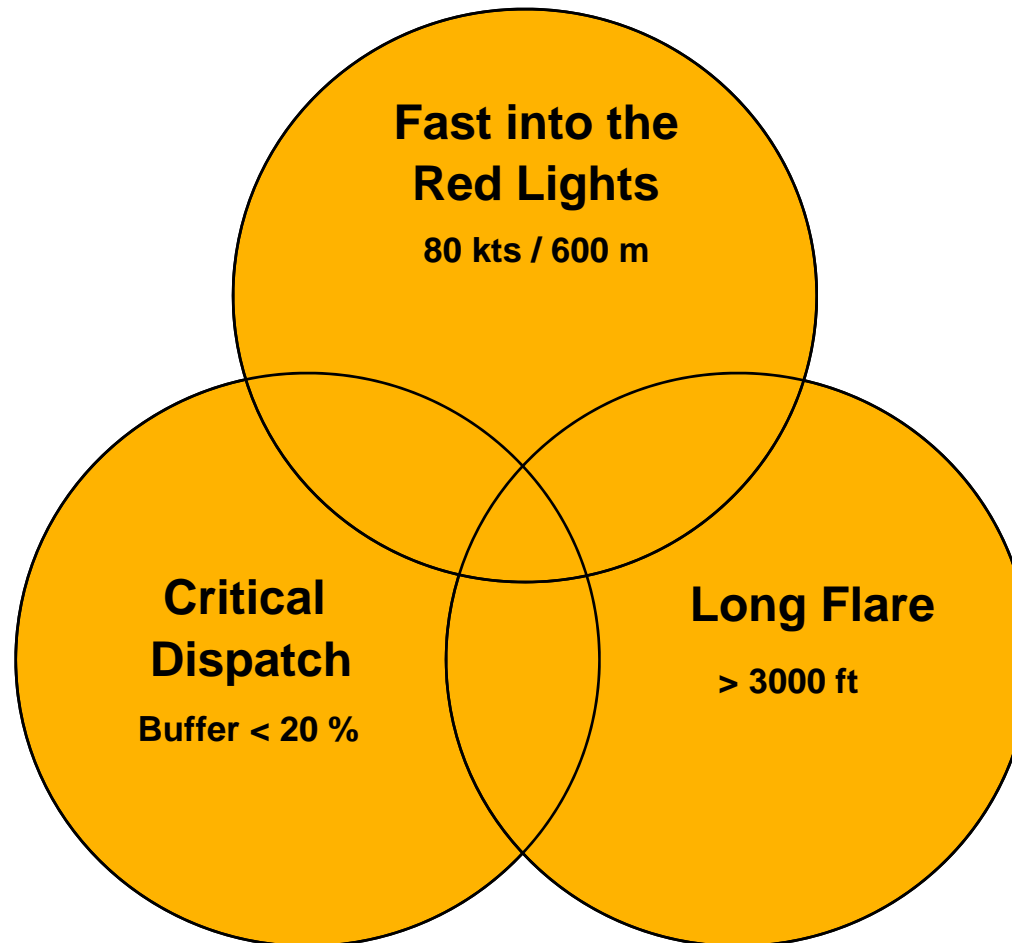


**Lufthansa**

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## Scenarios of high Risk for a Landing-Overrun

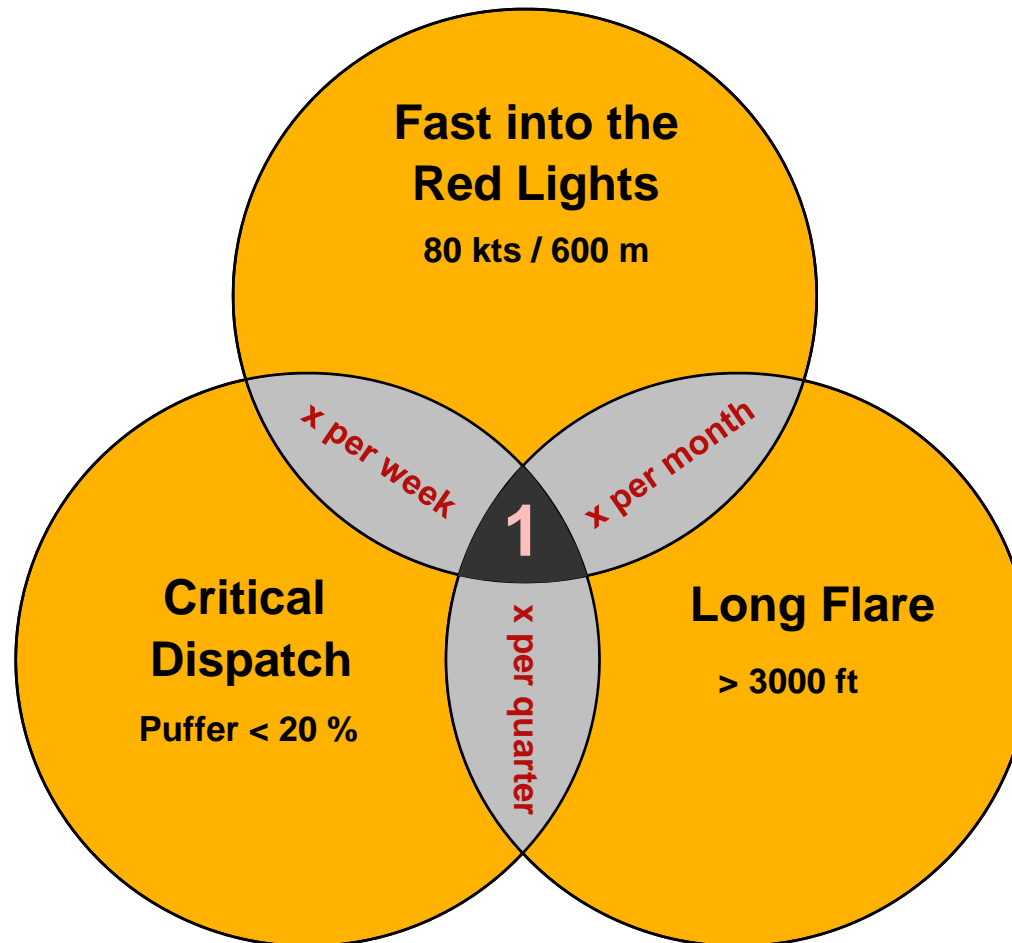
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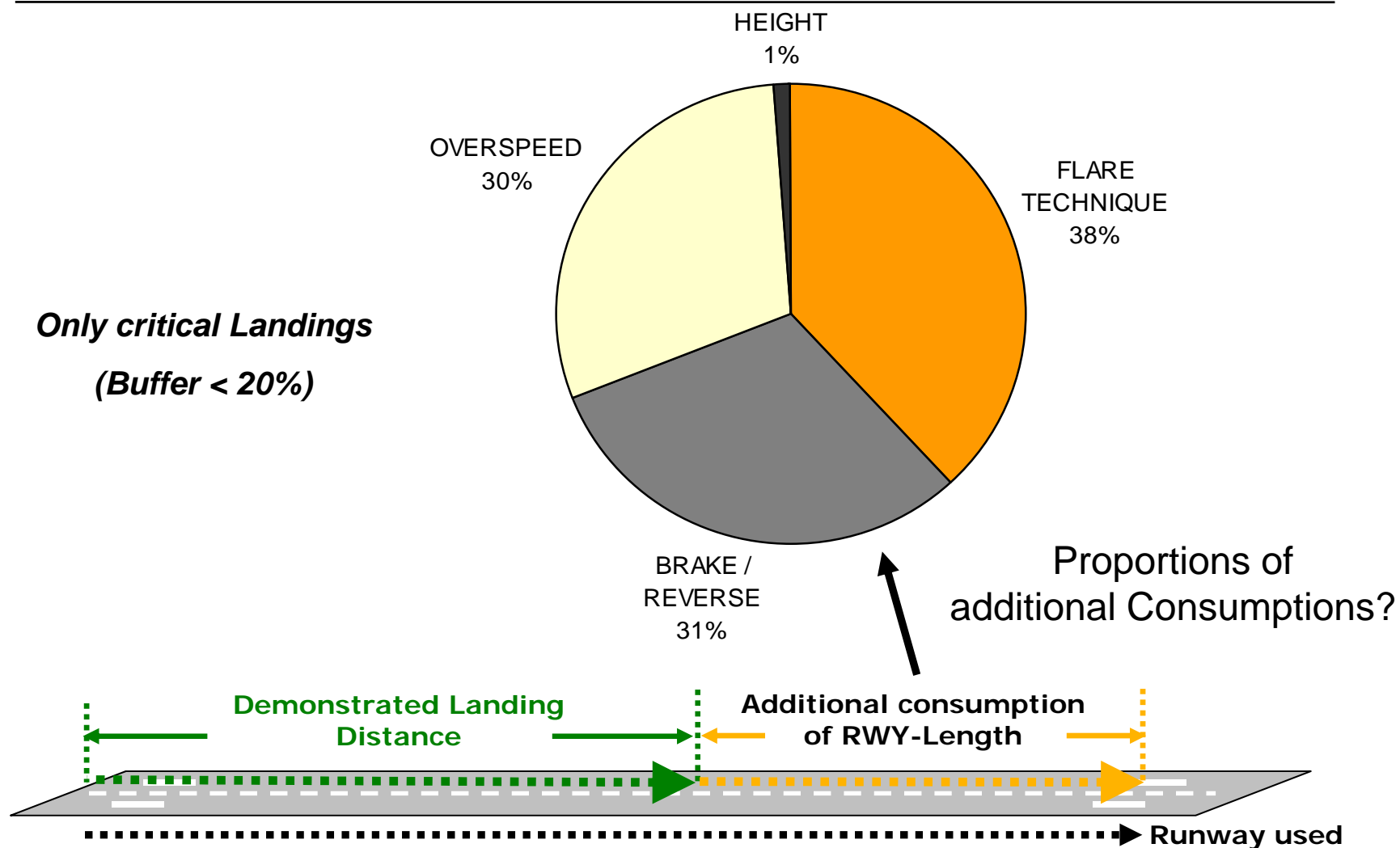
## Scenarios of high Risk for a Landing-Overrun

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## Reasons for Additional Consumption of Runway-Length against Demonstrated Landing Distance

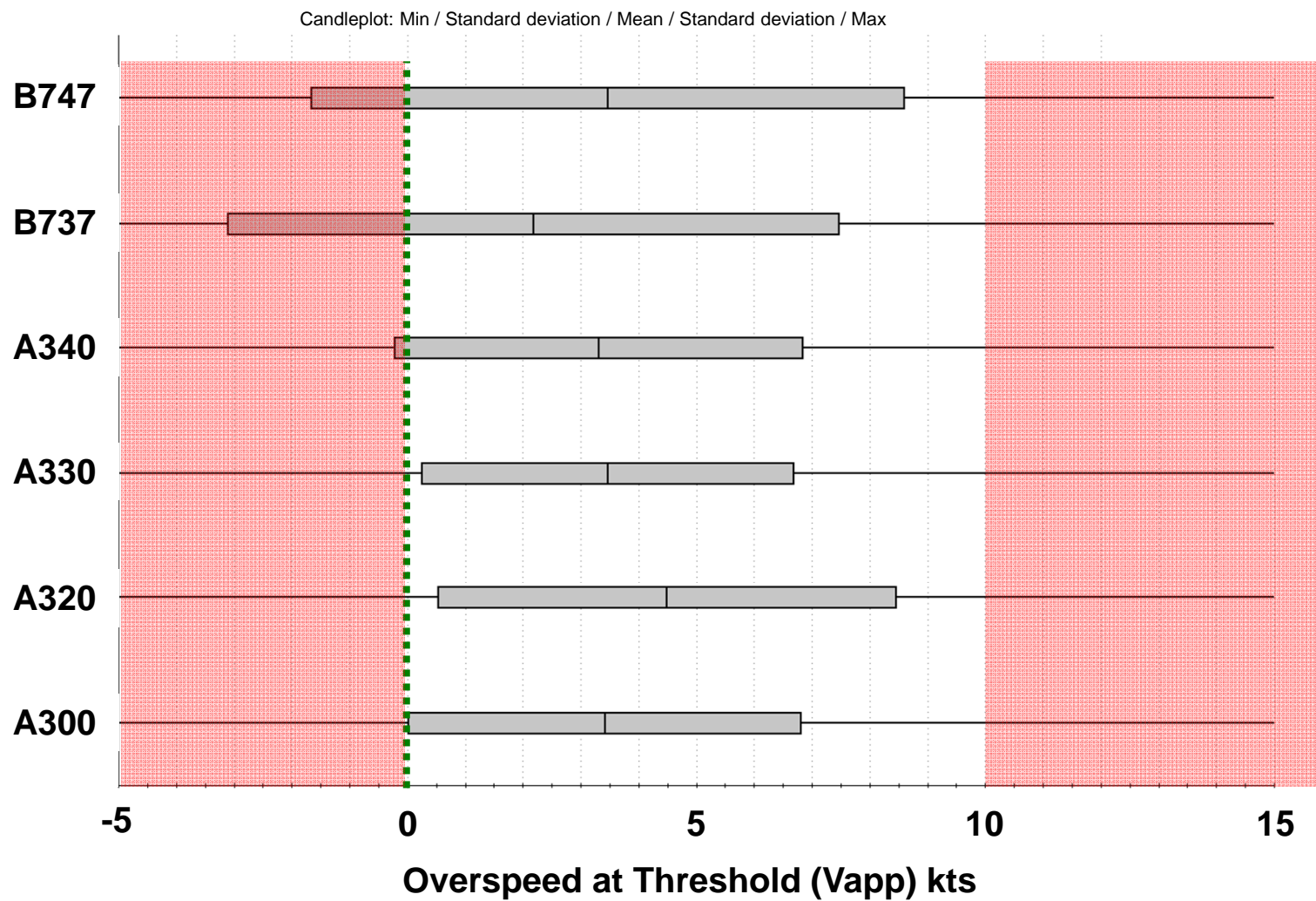
**Only critical Landings**  
(Buffer < 20%)





## Overspeed over Threshold

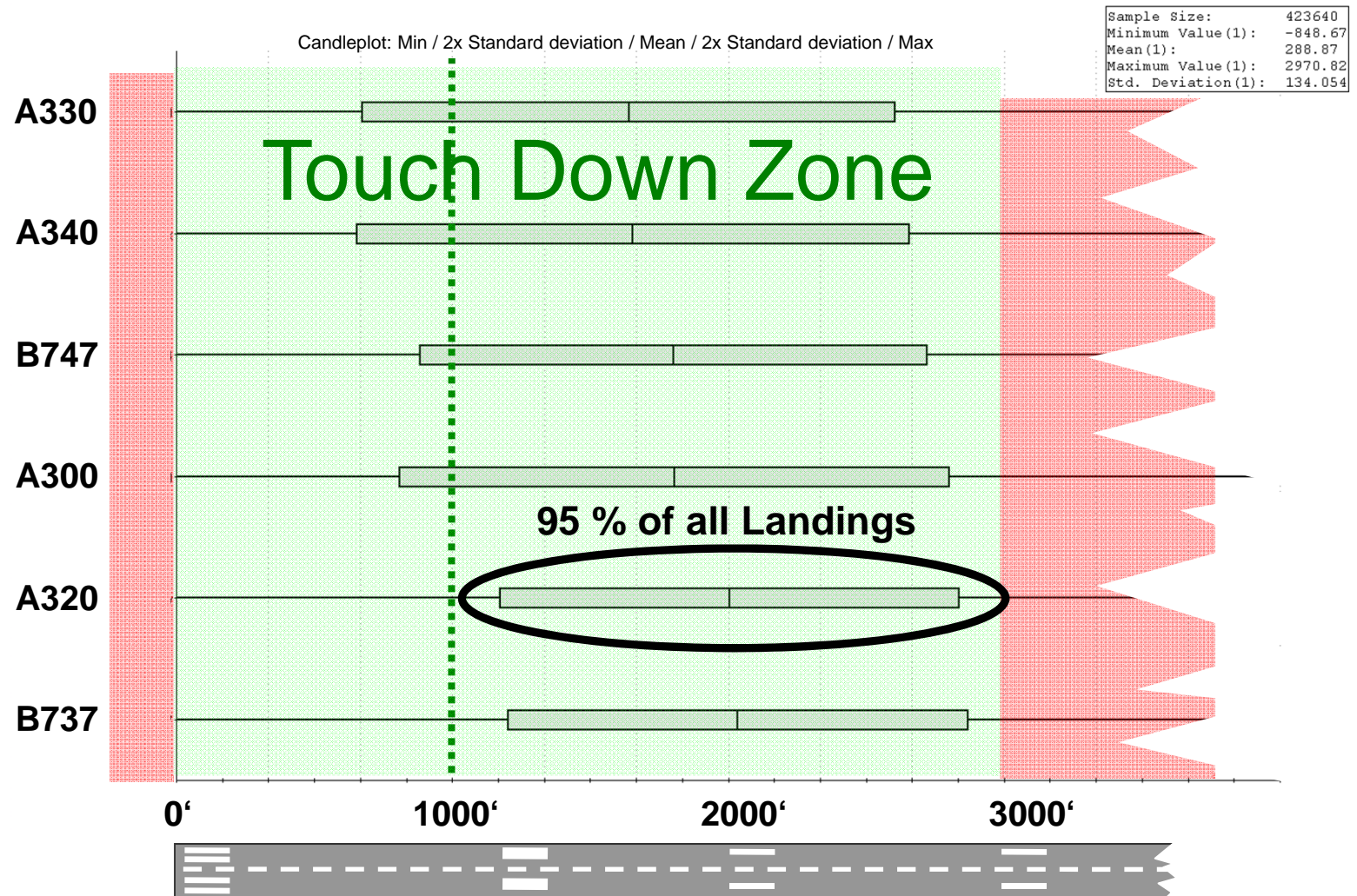
*compared to the Speed Cursor*



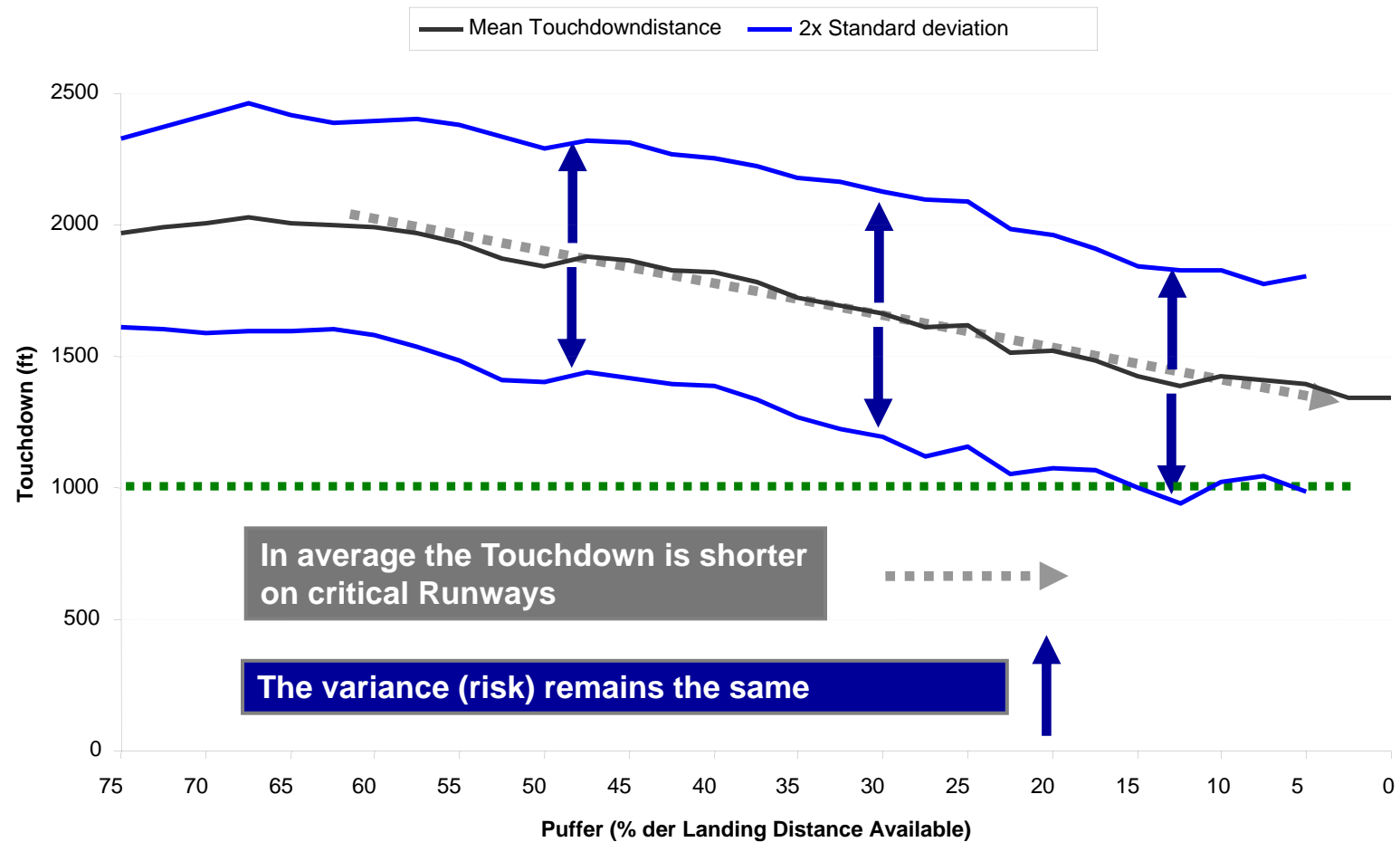
## Touchdown Point MUC Runway 08L



## Touchdown Point by Fleet



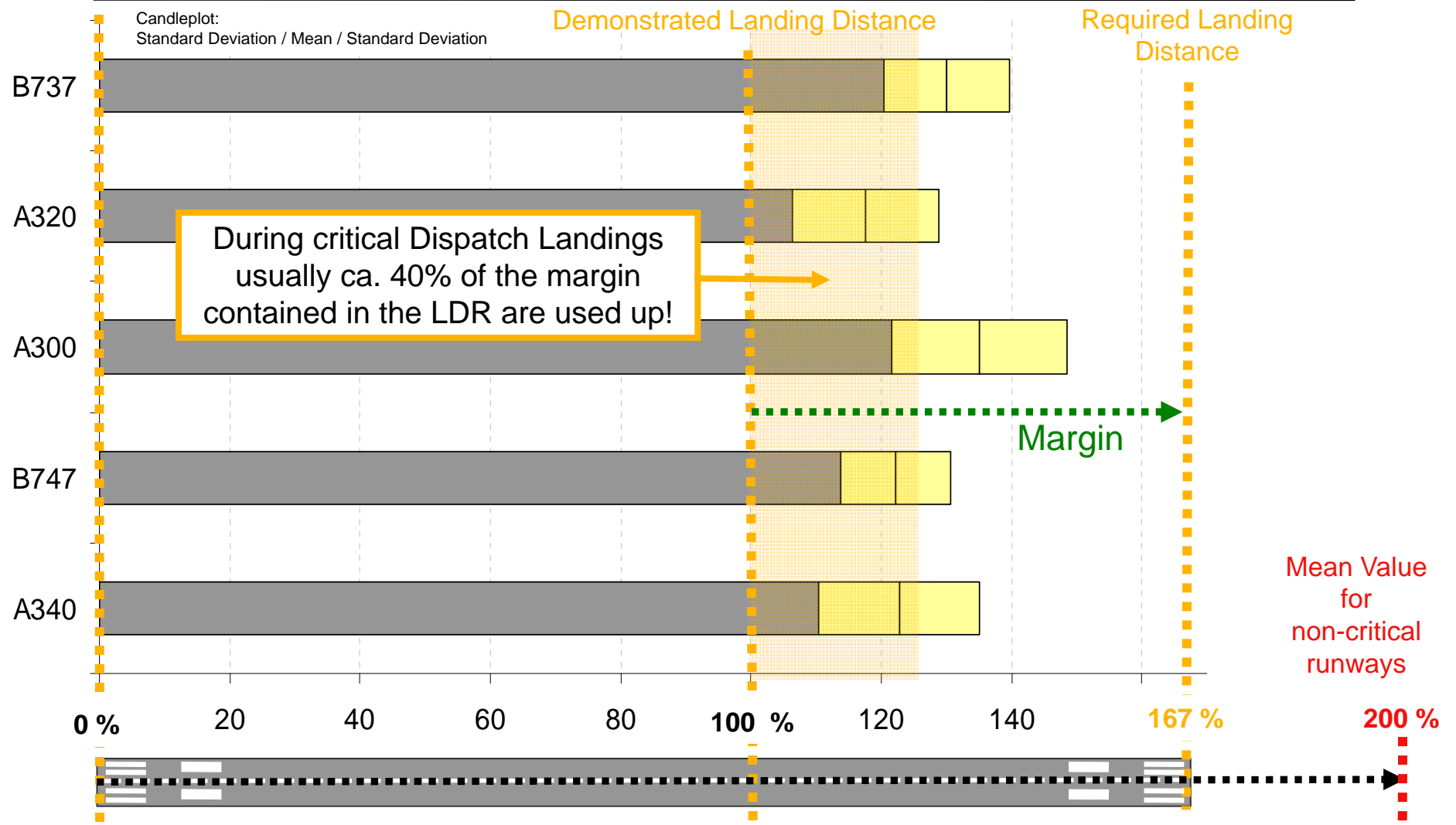
## Touchdown Point against Runway Length





# Average Consumption of Margin against Landing Distance Required

*Landing Distance Required = Landing Distance Available*







**Thanks for your attention!**