



International Aviation Forum  
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## FDA Fundamentals

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**AIRBUS**

# FDA Introduction

Flight Access : Event Folders View

**AirFASE** File View Advanced Tools Review About

DataBase : AirFASE  
User : training

Events

Event Name: \* Num.: \* Severity Level: All Exclude Event(s):

Flight Phase: \* Comment: \* Status: All AND

Event Folders Apply 1703 - Thrust Reduction Late at Land

01/03/2009 08:10:33	1818	High	LAN	Distance to THR in meters	-1060.64
01/01/2009 09:02:31	1818	Medium	LAN	Distance to THR in meters	-1033.82

1710 - No Standard Reverse Use  
1712 - Thrust Asymmetry in flight  
1800 - HDG Deviation at Take Off (1C  
1801 - Deviation below Glideslope (A  
1802 - Deviation above Glideslope (A  
1803 - Deviation from Localizer (Abo  
1804 - Deviation below Glideslope (1  
1805 - Deviation above Glideslope (1  
1806 - Deviation from Localizer (100  
1807 - Heading Deviation at Landing i  
1808 - Long Flare Time  
1812 - Height Low at Threshold  
1813 - Height High at Threshold  
1814 - HDG Significant Change in Ap  
1815 - Heading Excursion During Lar  
1817 - Short Flare Distance  
1818 - Long Flare Distance

63 events corresponding to filters within selected event

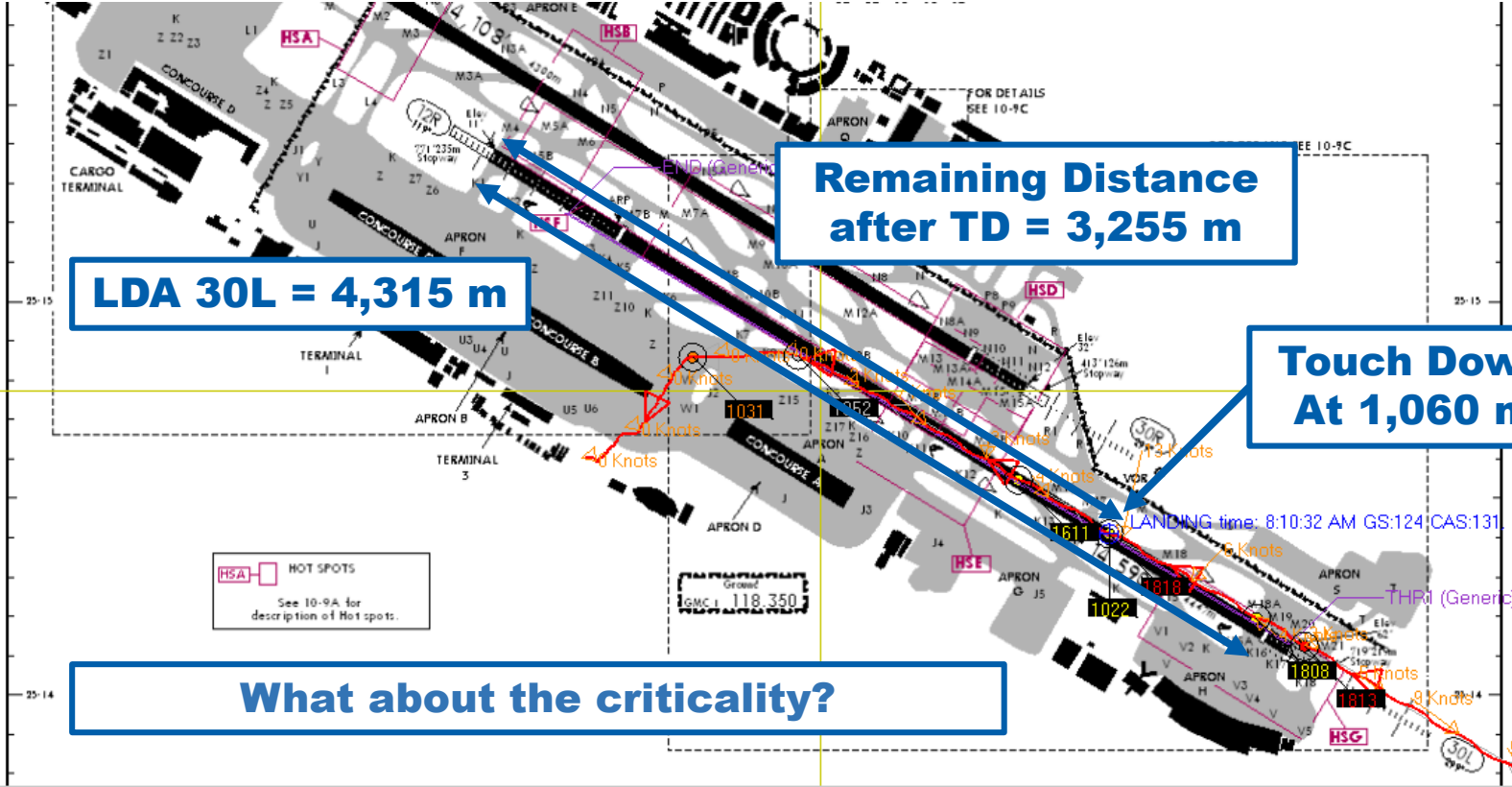
### Deviation Limits

from A330XXX01 V1.1.1

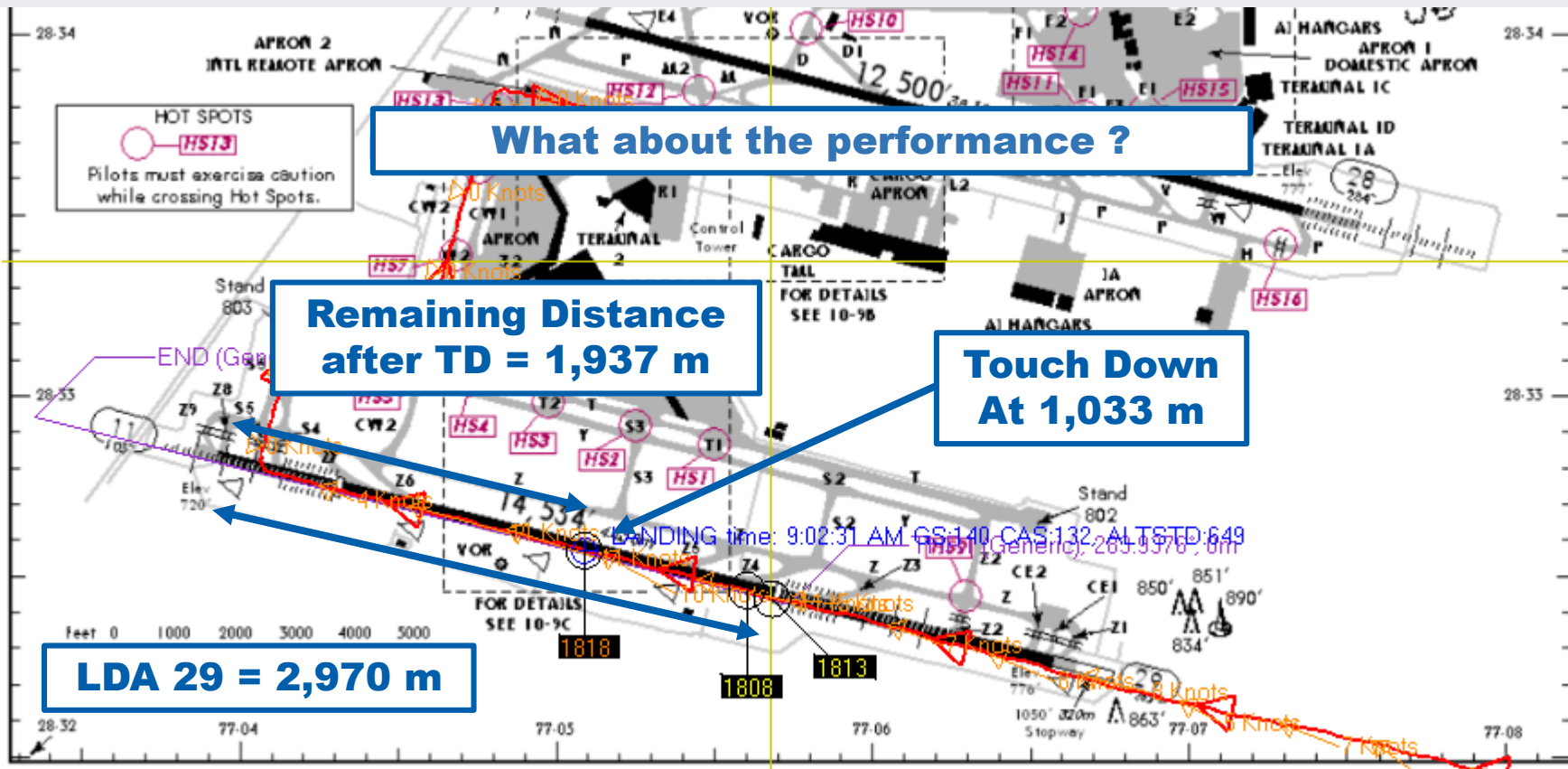
**DIST\_TO\_THR (at TD)**

<b>LOW</b>	750 m
<b>MEDIUM</b>	900 m
<b>HIGH</b>	1050 m

# Long Flare Distance Event



# Long Flare Distance Event



# Long Flare Distance Event

EFB

LDG PERF

FUNCTIONS

MSG LIST

25-3GMH

COMPUTATION IN-FLIGHT

WIND /kt (100/11)TL11

OAT °C 15 ISA +1

QNH hPa 1014

RWY COND 6-Dry

A-ICE Off

LW T 179.8

LDG CONF CONF FULL (STD)

AIR COND On (STD)

APPR TYPE Normal (STD)

GA GRADIENT % Min (STD)

VPilot kt 4

LDG TECHNIQUE MAN-A/THR on (STD)

BRK MODE Low

REV Yes (STD)

NORMAL

SINGLE RWY COMPUTATION<F2> MULTIPLE RWY COMPUTATION<Ctrl F2>

DELHI / INDIRA ... VIDP / DEL

RWY 29

ELEVN 751 ft SLOPE -0.22 %

MODIFY RWY

LENGTH 2970 m

RESULTS

[Redacted Results]

ACFT STS <F5>

COMPUTE <F8>

CLEAR <F6>

# Long Flare Distance Event

EFB

LDG PERF

FUNCTIONS

MSG LIST

25-3GMH

COMPUTATION IN-FLIGHT

WIND °/kt (100/11)TL11 R 2

OAT °C 15 ISA +1

QNH hPa 1014

RWY COND 6-Dry

A-ICE Off

LW T 179.8

LDG CONF CONF FULL (STD)

AIR COND On (STD)

APPR TYPE Normal (STD)

GA GRADIENT % Min (STD)

VPilot kt 4

LDG TECHNIQUE MAN-A/THR on (STD)

BRK MODE Med

REV Yes (STD)

NORMAL

SINGLE RWY COMPUTATION<F2>

MULTIPLE RWY COMPUTATION<Ctrl F2>

DELHI / INDIRA ... VIDP / DEL

RWY 29

ELEVN 751 ft

SLOPE -0.22%

MODIFY RWY

LENGTH 2970 m

RESULTS



ACFT STS <F5>

COMPUTE <F8>

CLEAR <F6>

# Long Flare Distance Event

EFB ▾ LDG PERF FUNCTIONS ▾ MSG LIST 25-3GMH

COMPUTATION IN-FLIGHT

WIND %kt (100/11) TL11 R 2

OAT °C 15 ISA +1

QNH hPa 1014

RWY COND 2-Medium to poor

A-ICE Off

LW T 179.8

LDG CONF CONF FULL (STD)

AIR COND On (STD)

APPR TYPE Normal (STD)

GA GRADIENT % Min (STD)

VPilot kt 4

LDG TECHNIQUE MAN-A/THR on (STD)

BRK MODE Manual (STD)

REV Yes (STD)

NORMAL

ACFT STS <F5>

COMPUTE <F8> CLEAR <F6>

SING DELF RWY 29 MODIFY RWY

ELEVN 751 ft SLOPE -0.22%

LE

RESULTS

**Heavy Rains Reported**

**What if > 3 mms ?**

# FDA Introduction

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AirFASE File View Advanced Tools Review About

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Flight Phase Comment Status

Event Folders Apply Events Flight Event

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63 events corresponding to filters within selected event

AirFASE training 27/03/2017 20:49

What about the criticality?

How to be effective?

FDA Fundamentals





**A Non-Punitive  
Programme**

**Data Into  
Perspective**

**Challenge  
The Read-Outs**



**A Non-Punitive  
Programme**

**Data Into  
Perspective**

**Challenge  
The Read-Outs**

## A Non-Punitive Programme

### Manual of Flight Data Analysis Programmes

***ICAO Doc 10000 / 1<sup>st</sup> Ed 2014***



“an FDAP may be described as a **non-punitive programme** for the routine collection and analysis of flight data to develop objective and predictive information **for advancing safety**”.

**Why a non-punitive programme?**

# Runway Overrun

## Precursors

- + Late Descent
- + Too High
- + Too Fast
- + Long Flare
  
- + **Landing after an unstabilized Approach**



# Runway Overrun

## Contributing Factors

- + Fatigue
- + No Crew Communication
- + No Crew Coordination
- + F/O Lack of Assertiveness

➤ **Many Pitch and Thrust adjustments during the flare**

**Latent Handling Problem?**

# Runway Overrun

## Handling Skill

- + No reported training issue

## Recent Crew Interview

- + Called for a Hard Landing

# Safety Policy

➤ **The “Three Strikes Law” in force at that airline**

**Three Hard Landings**



**You are Fired**

**Contributing Factor**

# Hard Landing

## Hazard Identification

- + Numerous High Vertical G at Landing FDA event

## Mitigation Action

- + Put Fine on Captain triggering an event

## Monitoring the Effectiveness

- + Less High vertical G at landing after few months

**Safety Improvement?**



# Hard Landing

## Side Effects

- + No more landing by FO
- + Increase number of **Long Flare distance** FDA events
  
- + **Flying the Software**
- + **Killing Voluntary reporting**

**A Non-Punitive Programme**



A Non-Punitive  
Programme

Data Into  
Perspective

Challenge  
The Read-Outs

# Hard Landing

- We **do not** monitor **Hard Landings**
- We monitor **High Vertical G at Landing**

### Goal :

- **To Identify Handling Issue at Landing**
- **To Prevent Hard Landing**

# High Vertical G at Landing

- High Vertical G at Landing **Triggering Values**
  - VRTG > 1.50 G → Low Severity Event
  - VRTG > 1.60 G → Medium Severity Event
  - **VRTG > 1.75 G → High Severity Event**
- A320 Vertical G Hard Landing Threshold = **2.6 G**

**A High severity event “High Vertical G at Landing” is NOT a hard landing as per the maintenance definition.**

# High Vertical G at Landing

**An FDA Tool is Not a Maintenance Tool**

**To Identify Trends**

**Predictive Safety Management**

# Hard Landing Risk

## Precursors

- + Path High at Landing (below 20ft)
- + Vertical Speed High before touchdown
- + Pitch and/or Roll Cycling at Landing
- + Pitch High at Landing
- + Speed Low
- + etc.



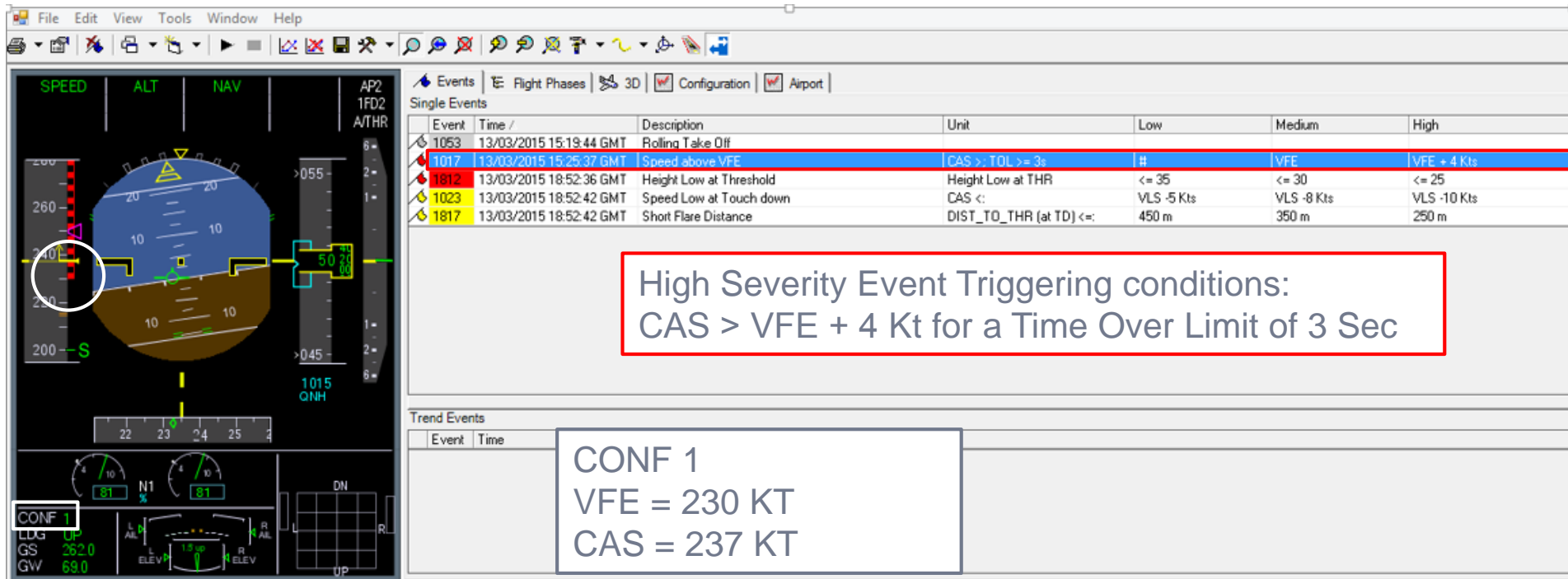
A Non-Punitive  
Programme

Data Into  
Perspective

Challenge  
The Read-Outs

## Challenge the Read-Outs

# Speed Above VFE





# Speed Above VFE

## Recording Limitation

- + VFE not recorded
- + Flaps lever position not recorded
- + Configuration not recorded

## Solution

- + Slats and Flaps Angles

## Speed Above VFE

### To Sum up to get the VFE

Slats\_Angle values



**\_Slats\_Angle**

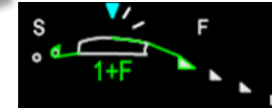
Algorithm  
Range, offset,  
0 position value



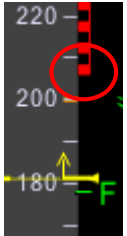
**\_Slats\_Position**



**\_Config**



**\_VFE**



Algorithm  
Range, offset,  
0 position value



**\_Flaps\_Position**



Flaps\_Angle values

**\_Flaps\_Angle**

# Speed Above VFE

## Issue

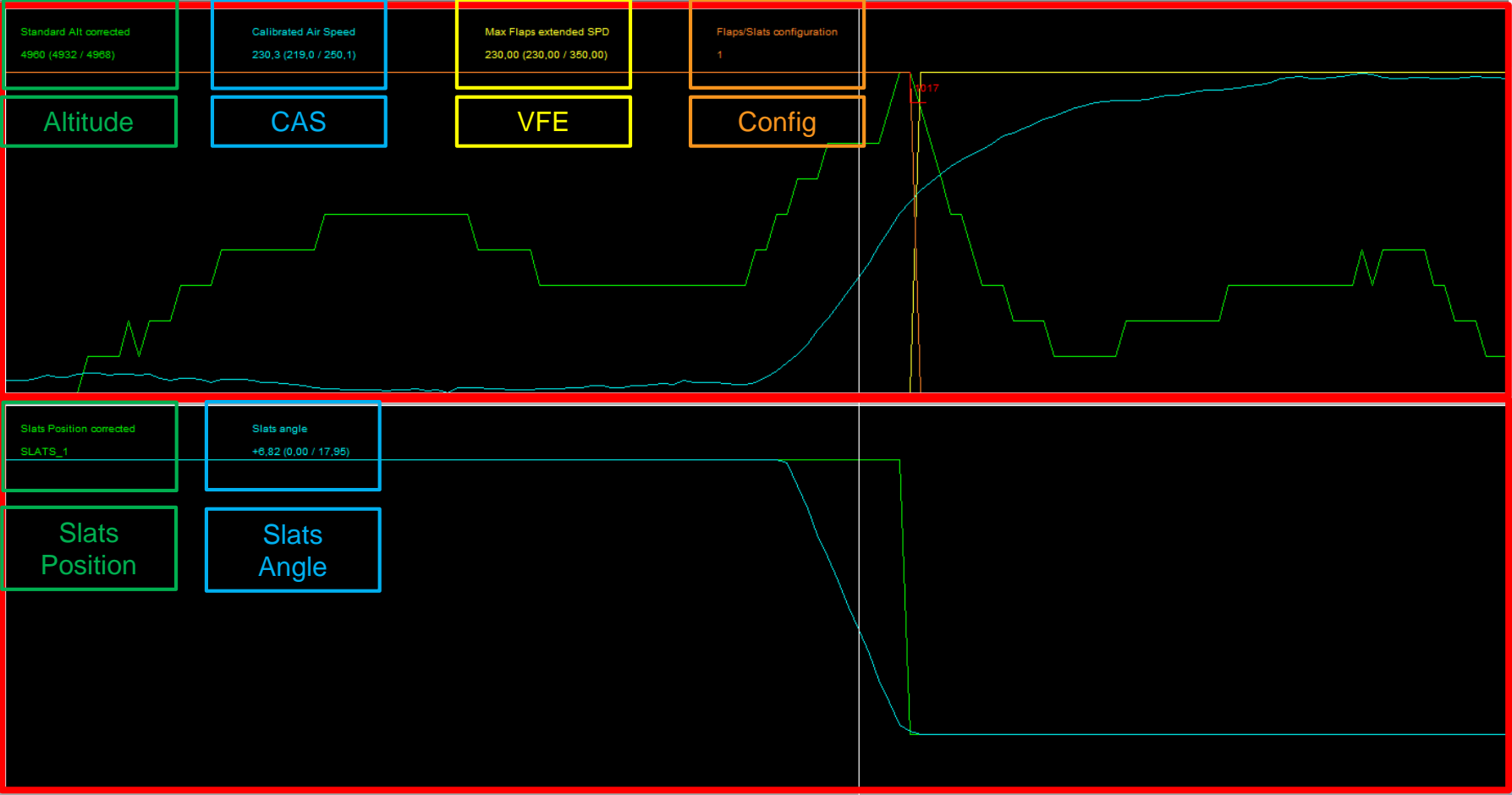
- Slats & Flaps Angles at the next configuration position to get the right VFE
- On board VFE is linked with the Flaps Lever Position

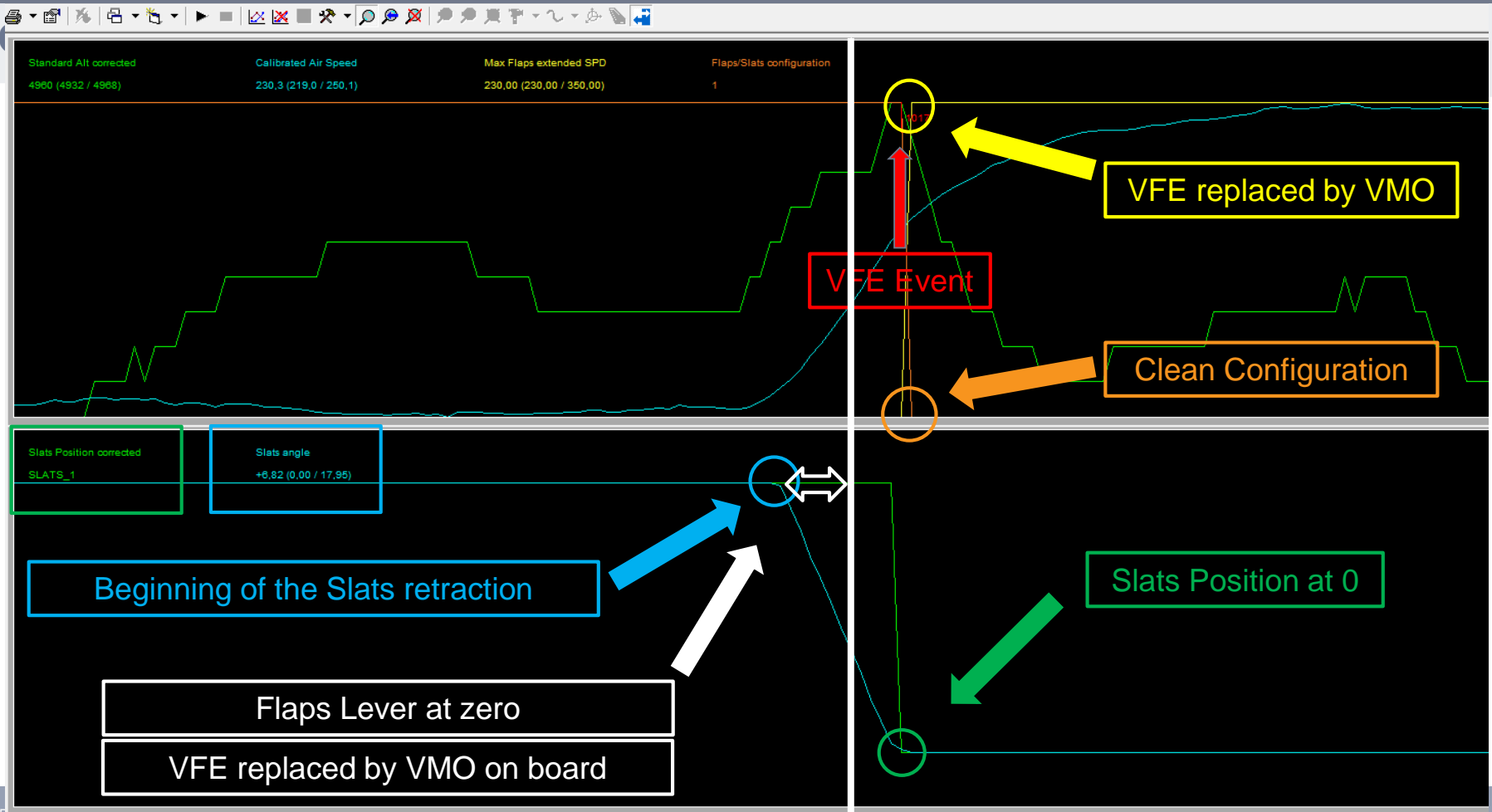
## Consequence

- Delay in updating the VFE

## Solution

- Call the right parameter





# Event Investigation

## Requirements

- Investigation without delay
- Competent FDA team member
- Ability to challenge in order to validate the results

## Risks

- Loss of time on wrong events
- Focussing at finding solutions on unexisting issue
- Loss of Confidence in the FDA programme by the crew

# Fundamentals for FDAP Efficiency

## A Non-Punitive Programme

- + De-identification process - Confidentiality
- + Safety Policy promoting a just culture endorsed by the Management

## Competent FDA Team Members

- + A Critical Eye
- + Put the data into perspective
- + Able to challenge the results

**Improving Safety**

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