



# AFI Flight Operations Safety Awareness Seminar (FOSAS)

## Runway Excursion

ICAO/Airbus  
Nairobi, 19-21 Sep. 2017

**AIRBUS**

## Context



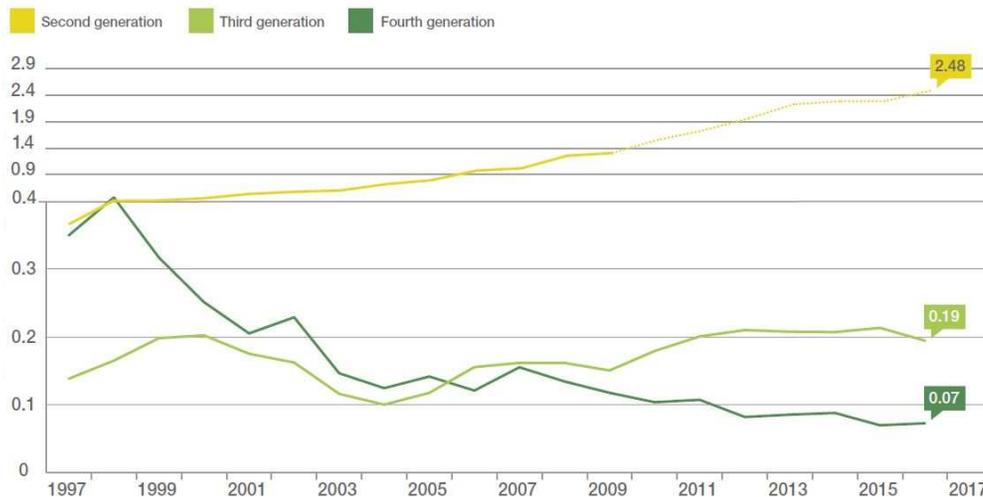
## Breakdown per Accident Category (since 1997)

### + Runway Excursion (RE)

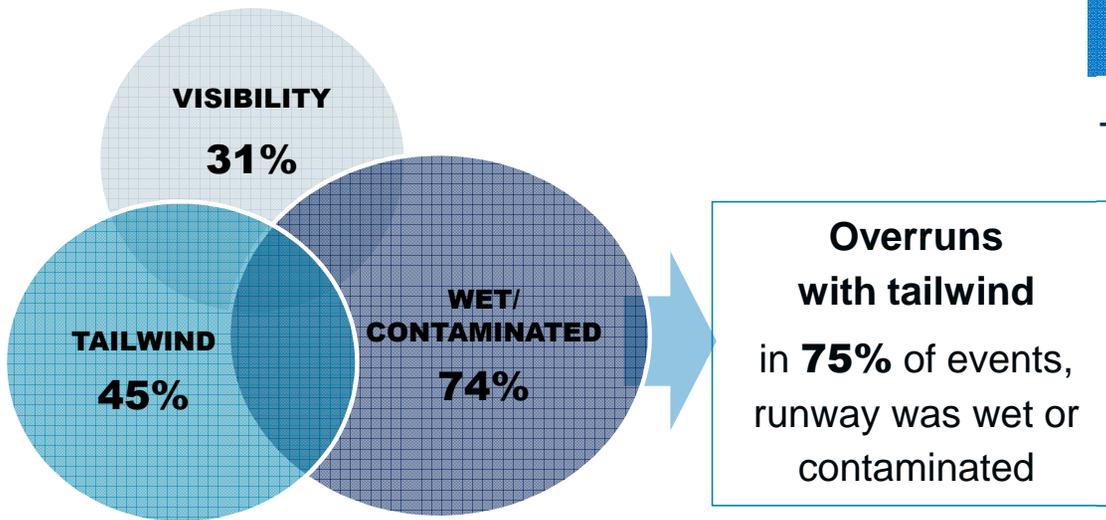
Around 14% of fatal accidents  
And 35% of hull loss

New Technologies to reduce RE accidents have recently been introduced

10 year moving average RE rate by aircraft generation per million flights



# Context



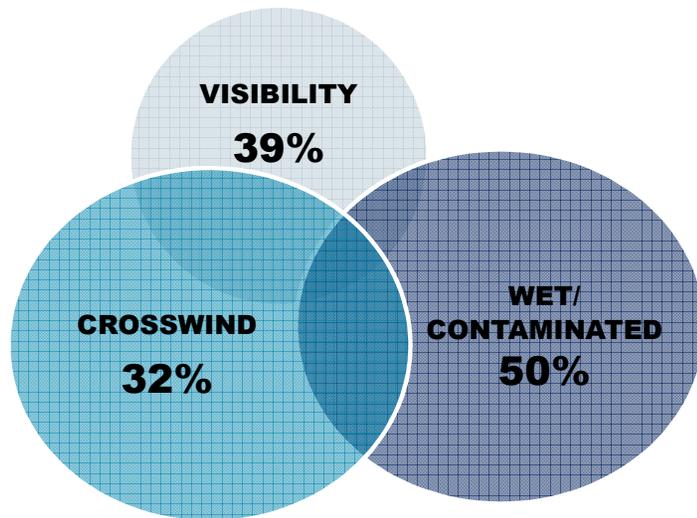
## Runway Overrun

+ **Reported Airbus events since 2005**

Average of 3 events per year

80% with weather as contributor

## Context



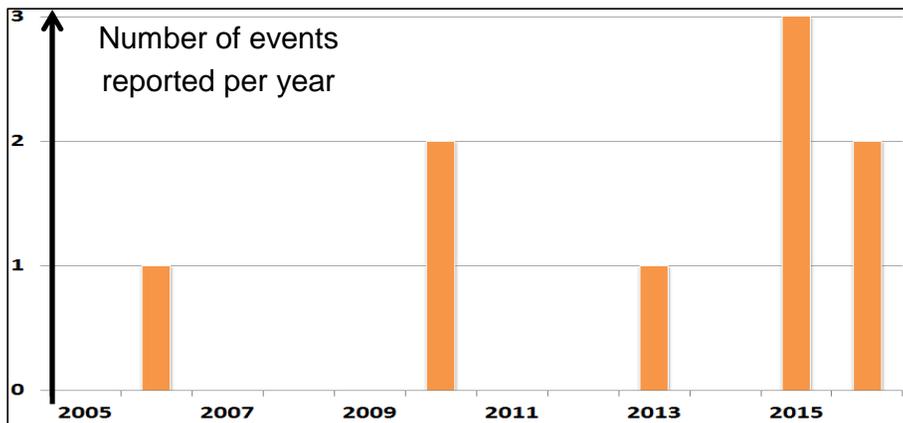
## Runway Lateral Excursion

+ **Reported Airbus events since 2005**

Average of 7 events per year

75% with weather as contributor

## Context



## Runway Undershoot

+ **9 Reported Airbus events since 2005**

7 events with weather as contributor

- Windshear, Downburst, Thunderstorm
- Fog, Mist, Heavy rain, Drifting snow

Majority of events were non precision approaches



# Agenda

## Runway Excursion

**Factors**

**Technique**



# Agenda

## Runway Excursion

**Factors**

**Technique**

23:08:15 UTC



SPEED

G/S

LOC

AP 1+2  
1 FD 2  
ATHR



117.90  
3.2 NM



QNH 1004

DN

Brake Pedals

80  
60  
40  
20  
0

Rudder Pedals

40 20 0 -20 -40

AUTOBRAKE: MED

F/CTL

GBY

SPD BRK



DN

# Factors



## Runway Excursions



**Usually a combination of:**

- + Operational deviations
- + Environmental hazards

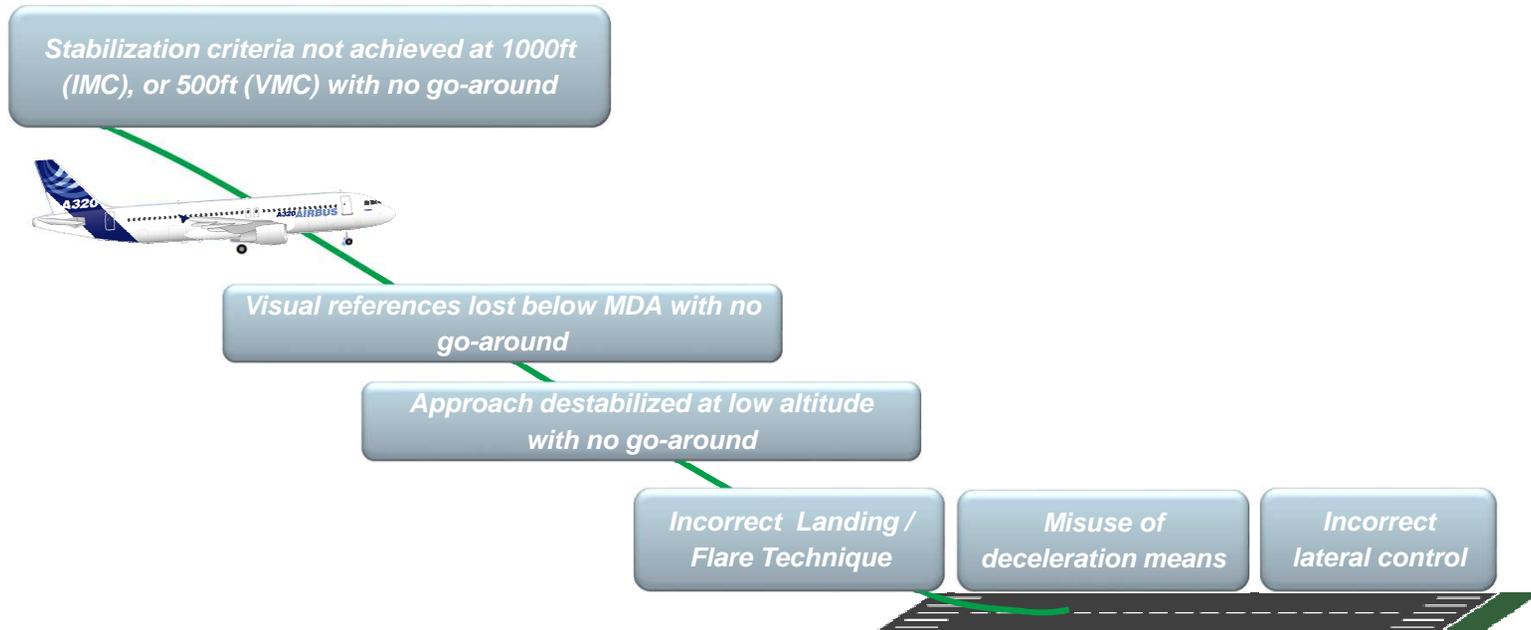
### **Prevention**

- + Awareness of the threats during the approach
- + Adherence to SOPs
- + Good CRM and Workload Management



# Factors

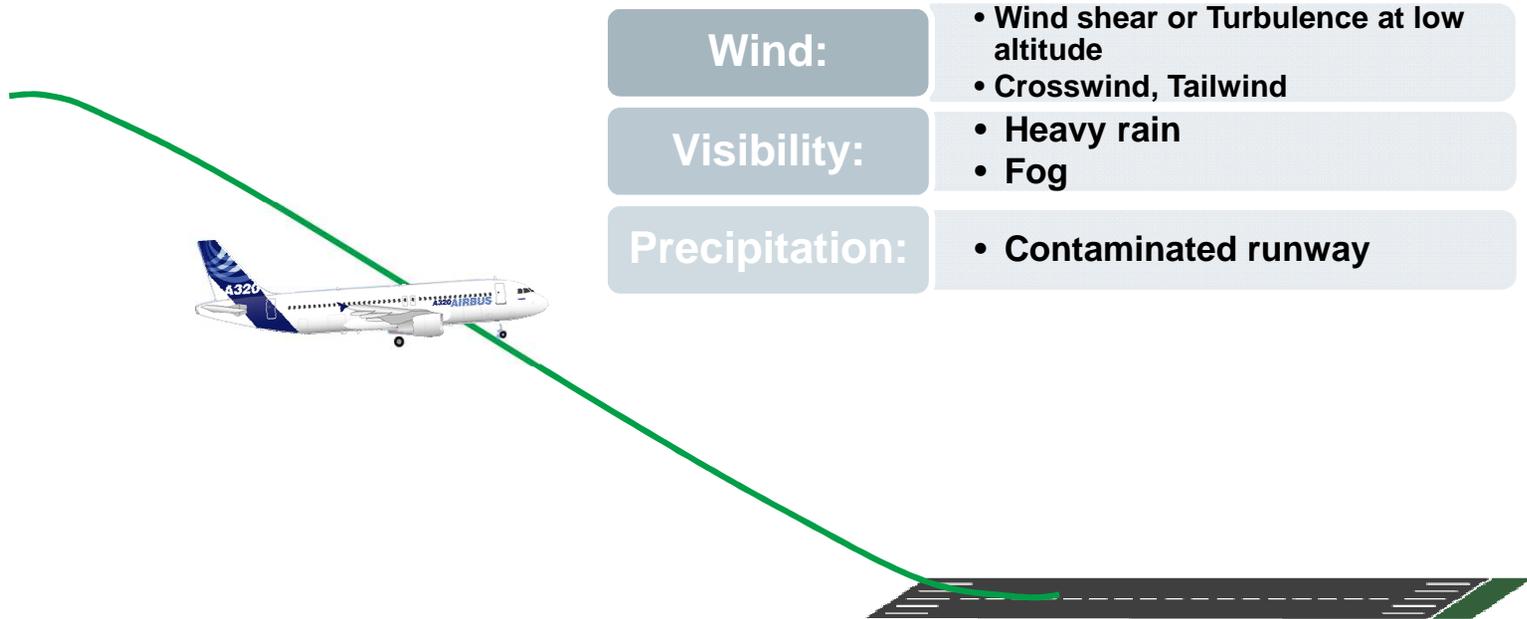
## Risk Factors – Operational Deviations



# Factors



## Risk Factors – Environmental Hazards



# Agenda

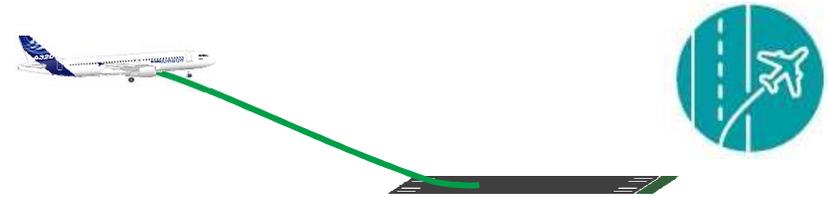
## Runway Excursion

Factors

Technique

# Technique

## Approach Preparation

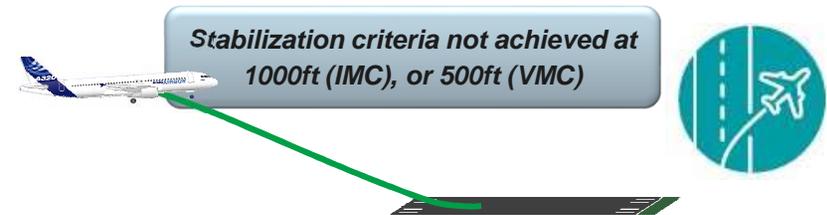


Be correctly seated

Be aware of the landing conditions

# Technique

## Go-around Decision



An approach stabilized at 1000ft IMC (or 500ft VMC) is a key parameter towards an optimum landing.

*Stabilization criteria - Extract from FCOM – SOP – Approach – Stabilization Criteria*

- The aircraft is on the correct lateral and vertical flight path
- The aircraft is in the desired landing configuration
- The thrust is stabilized, usually above idle, and the aircraft is at target speed for approach
- The flight crew does not detect any excessive flight parameter deviation.

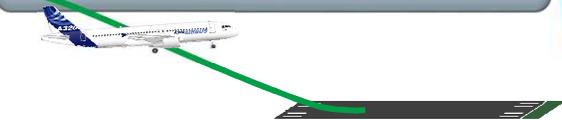
**CONSIDER GO-AROUND AS AN OPTION DURING THE ENTIRE APPROACH**



# Technique

## Low Altitude Changes

Approach destabilized at low altitude, or visual references lost below minimum



Wind gradient, Turbulence, Heavy rain increase risk of destabilization, or loss of visual references at low altitude.

Consideration about Go-around - Extract from FCTM – Normal Procedures - SOP - Go-Around

**DECISION MAKING**  
The flight crew must consider to perform a go-around if:

- There is a loss or a doubt about situation awareness, or
- There is a malfunction which jeopardizes the safe completion of the approach e.g. major navigation problem, or
- ATC changes the final approach clearance resulting in rushed action from the crew or potentially unstable approach, or
- The approach is unstable in speed, altitude, or flight path in such a way that stability is not obtained by 1 000 ft AAL IMC (500 ft AAL in VMC), or is not maintained until landing, or
- Any GPWS, TCAS, Windshear, or ROW alerts for the relevant runway condition occur, or
- Adequate visual references are not obtained at minima or lost below minima.

The flight crew must consider to perform a go-around if:

... Adequate visual references are not obtained at minima or lost below minima

**BE GO-AROUND MINDED DURING THE WHOLE APPROACH AND LANDING \***

*\* The PF must not initiate a go-around after the selection of the thrust reversers*

# Technique

## Low Altitude Changes

Optimum use of automation may ensure successful landings in crosswind and turbulent weather.

### In difficult weather conditions:

- + Use **AP** and **A/THR** to reduce crew workload

### In gusty wind conditions:

- + Use managed speed to take advantage of the **GS MINI** function

### On final approach, when visual conditions established:

- + Evaluate the drift angle in order to maintain it after AP disconnection
- + Disconnect AP early enough to get familiar with conditions
- + If crosswind, avoid large inputs on the sidestick (trimmed aircraft)

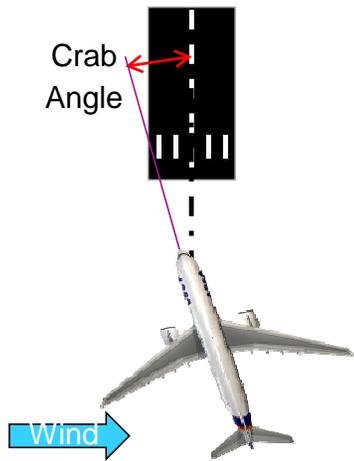
*Approach destabilized at low altitude, or  
visual references lost below minimum*



# Technique

## Crosswind and Turbulent Weather

Incorrect crosswind landing technique increases the risk of lateral excursions



+ A crabbed approach (wings level) is recommended followed by the de-crab technique



An article on crosswind certification is available in Safety First Magazine

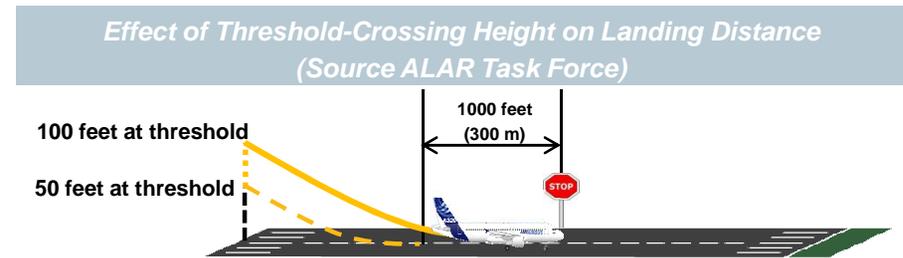
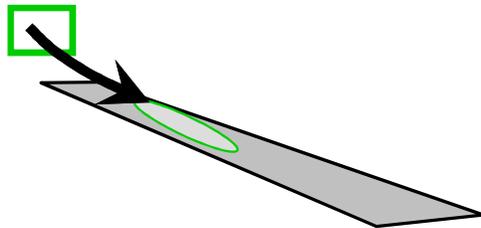
# Technique

## Flare Technique

A fast approach and/or excess height at the threshold are threats to a safe landing



+ Threshold window: accurate approach speed and height 50ft



# Technique

## Flare Technique

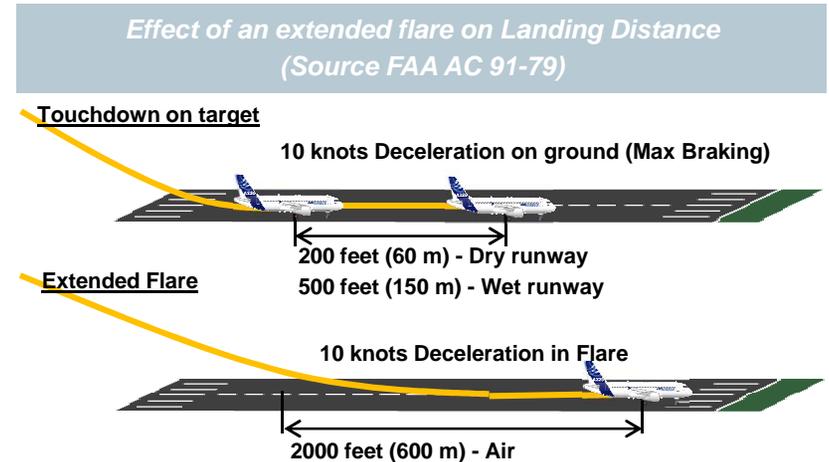
A high, or an extended flare significantly increases the landing distances

*Pitch Control – Extract from FCTM – Normal Procedures – LANDING – FLARE and TOUCHDOWN*

Do not allow the aircraft to float or do not attempt to extend the flare by increasing pitch attitude in an attempt to achieve a perfectly smooth touchdown.

*A prolonged float will increase both the landing distance and the risk of tail strike.*

**AVOID PROLONGED FLARE  
PERFORM A POSITIVE TOUCHDOWN**



# Technique

## Use of deceleration means

Any delay in deceleration phase on ground uses significant landing distance

### DESCENT PREPARATION



**AUTO BRK ..... AS RQRD**

### APPROACH



**AFTER L/G DOWN  
GROUND SPOILERS ..... ARM**

### LANDING



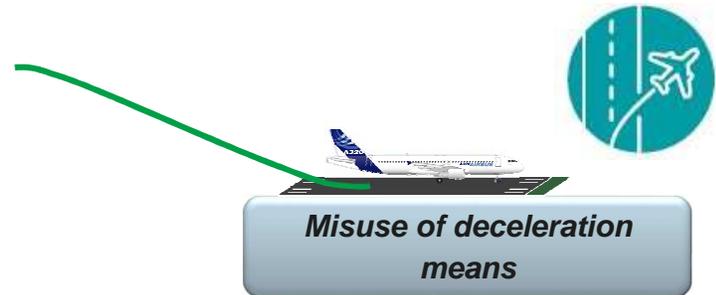
**FLARE  
THRUST levers ..... IDLE  
AT TOUCHDOWN  
ALL THRUST levers ..... REV MAX or REV IDLE**



PM checks and calls deceleration systems activation

**SPOILERS!  
REVERSE GREEN!  
DECEL!  
SEVENTY KNOTS!**

**APPLY SOP  
FOR OPTIMUM BRAKING PERFORMANCE**



# Conclusion



**A Runway Excursion is a combination of operational factors in a more or less favourable or changing environment**



**SOP and CRM remain the primary means to prevent runway excursion at landing**

**BE GO-AROUND MINDED DURING THE WHOLE APPROACH AND LANDING**

**AVOID PROLONGED FLARE AND PERFORM A POSITIVE TOUCHDOWN**

**APPLY SOP FOR OPTIMUM BRAKING PERFORMANCE**

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